

HAZARD MITIGATION & COMMUNITY WILDFIRE PROTECTION PLAN

—

NOVEMBER 2020



Developed for the communities of:

- Belgrade
- Bozeman
- Manhattan
- Three Forks
- West Yellowstone
- Montana State University
- Unincorporated Gallatin County



EXECUTIVE SUMMARY

Disasters can strike at any time in any place. In many cases, actions can be taken before disasters strike to reduce or eliminate potential negative impacts. These actions can often mitigate the adverse effects of disasters and protect life, property, the economic and other values. The Gallatin County Hazard Mitigation Plan (HMP) addresses 19 major hazards with respect to risk and vulnerabilities countywide, including the communities of Bozeman, Belgrade, Big Sky, Manhattan, Three Forks, and West Yellowstone. Through a collaborative planning process, the Gallatin County hazards were identified, researched, profiled, and prioritized. In addition, Montana State University (MSU) elected to update their 2013 Pre-Disaster Mitigation (PDM) Plan as an annex to the county's HMP. The MSU Annex is designated as **Annex A** and is included in its entirety following the HMP Sections.

The major hazards are each profiled in terms of their hazard description, history, probability and magnitude, mapping, vulnerabilities, data limitations, and other factors. The vulnerabilities to critical facilities; critical infrastructure; structures; the population; economic, ecologic, historic, and social values; and future development are updated for each hazard. Based on the probability and extent of potential impacts that were identified in the risk assessment, the prioritizations of hazards within Gallatin County are displayed in **Table ES-1**. The countywide prioritizations are derived from hazard prioritization and ranking exercises held in five distinct community areas (districts) across the county in February 2018. A map (Figure 2-1) showing the community district boundaries can be found in Section 2.2.4 on page 2-4. Estimates of risk for Gallatin County were developed using methodologies promoted by the Federal Emergency Management Agency's (FEMA) hazard mitigation planning guidance [FEMA, 2018a] and generated by FEMA's HAZUS-MH 4.2 risk assessment tool [FEMA, 2018b].

MSU completed a similar process for identifying and ranking hazards that could affect the university community and the MSU-Bozeman campus. Many of the hazards identified by MSU overlap with hazards identified at the county level, however there are several hazards that are unique to the university. Regardless, the university setting has different vulnerabilities and risk mitigation capabilities that are tailored to its environment. The list and ranking of hazards for MSU can be found in **Annex A**.

Table ES-1-1. 2018 Gallatin County Hazard Prioritizations

Level	Hazard
High Priority	Critical Infrastructure Disruption (includes Cybersecurity) Drought Earthquake Severe Weather Wildfire
Moderate Priority	Avalanche and Landslide Civil Unrest Communicable Disease and Bioterrorism Environmental Hazards Flooding Ground Transportation Accident Hazardous Materials Release Urban Conflagration Violence (Violent Act / Attack)
Low Priority	Aviation Accident Dam Failure Railroad Accident Terrorism Volcanic Activity and Ash Fall

The following goals are outlined in the Mitigation Strategy (Section 5.0) based on risk assessment results:

- / Goal 1: Reduce impacts from wildfire
- / Goal 2: Reduce impacts from severe weather and drought
- / Goal 3: Reduce impacts from earthquakes
- / Goal 4: Reduce impacts from critical infrastructure disruption
- / Goal 5: Reduce impacts from flooding
- / Goal 6: Reduce losses from a transportation or hazardous materials accident
- / Goal 7: Prevent significant loss of life from communicable disease and bioterrorism
- / Goal 8: Promote all-hazard mitigation measures

Associated with each of the goals are objectives and mitigation actions that range from implementing security measures to increasing available data to providing community education. The mitigation projects are prioritized based on cost, feasibility, population benefit, property benefit, and the probability and impact of the hazards being mitigated. An implementation plan outlines the suggested course of action, given the limited resources available to Gallatin County and individual jurisdictions. Gallatin County Emergency Management (GCEM) is responsible for implementing and maintaining the plan. Other recommended activities, such as integrating this plan into a variety of county, city, and town plans, regulations, and documents, will further the goals of hazard mitigation in Gallatin County.

The Gallatin County HMP has been prepared in compliance with Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act), 42 U.S. C. 5165, enacted under Sec. 104 of the Disaster Mitigation Act of 2000 (DMA 2000) Public Law 106-390 of October 30, 2000, as implemented in Title 44, Chapter 1, Part 201 of the Code of Federal Regulations (CFR) dated October 2007, and most recently amended on October 2, 2015 (80 FR 59459). The HMP includes risk assessments for multiple hazards, a public outreach effort, and development of a mitigation strategy that incorporates measures intended to eliminate or reduce the effects of future disasters within Gallatin County.

FEMA requires state, tribal, and local governments to develop and adopt hazard mitigation plans as a condition for receiving certain types of non-emergency disaster assistance, including funding for

mitigation projects. Through the Hazard Mitigation Assistance (HMA) grant programs (Hazard Mitigation Grant Program-HMGP, Pre-Disaster Mitigation-PDM, and Flood Mitigation Assistance-FMA), FEMA offers planning grants that support state, tribal, and local governments in developing and updating mitigation plans. The following web address (URL) provides a table that summarizes FEMA's Assistance Programs and whether a mitigation plan is required to access each of the programs:

<https://www.fema.gov/hazard-mitigation-plan-requirement>).

*This plan has been approved by FEMA as an accepted hazard mitigation plan; therefore, the county and various jurisdictions associated with the plan may be eligible for federal mitigation funds and grants. This plan serves as a guide for understanding the major hazards present in Gallatin County and the communities/districts, including Montana State University-Bozeman (**Annex A**), and provides a strategy for preventing or reducing some of the potential impacts that could result from these hazards.*

As part of this HMP update, GCEM elected to incorporate an update to the county's Community Wildfire Protection Plan (CWPP) directly within the HMP document. There are several benefits to integrating a CWPP into the HMP document, as outlined in the FEMA publication, [Integrating Community Wildfire Protection Plans and Natural Hazard Mitigation Plans](#), which can be accessed at the following URL:

<https://mil.wa.gov/uploads/pdf/PLANS/integrating-cwpps-and-hmps.pdf>

The CWPP update is included as **Attachment 1** to this HMP.

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LIST OF ACRONYMS

ACS – American Community Survey (US Census)
AHAD – All Hazards All Disciplines
A.D. – Anno Domini
BFE – Base Flood Elevation
BLM – Bureau of Land Management
BNSF – Burlington Northern Santa Fe
CAMA – Computer Assisted Mass Appraisal
CDBG – Community Development Block Grant
CDCP – Centers for Disease Control & Prevention
CFR – Code of Federal Regulations
CFS – Cubic Feet per Second
CGNF – Custer-Gallatin National Forest
CMZ – Channel Migration Zone
CWPP – Community Wildfire Protection Plan
DEM – Digital Elevation Model
DEQ – Department of Environmental Quality
DES – Disaster and Emergency Services
DHS – Department of Homeland Security
DMA – Disaster Mitigation Act
DNRC – Department of Natural Resources and Conservation
DOT – Department of Transportation
DPHHS – Department of Public Health and Human Services
EAP – Emergency Action Plan
EDA – Economic Development Administration
EO – Executive Order
EOC – Emergency Operations Center
EMS – Emergency Medical Services
EPA – Environmental Protection Agency
EPCRA – Emergency Planning Community Right-to-Know Act
FBI – Federal Bureau of Investigation
FEMA – Federal Emergency Management Agency
FIRM – Flood Insurance Rate Map
FIS – Flood Insurance Study
FMA – Flood Mitigation Assistance
FR – Federal Register
FRA – Federal Railroad Administration
FS – Forest Service
FWS – Fish & Wildlife Service
GCEM – Gallatin County Emergency Management
GIS – Geographic Information System
GNFAC – Gallatin National Forest Avalanche Center
HAZMAT – Hazardous Materials
HAZUS-MH – Hazards United States Multi-Hazard
HMGP – Hazard Mitigation Grant Program
HMP – Hazard Mitigation Plan
HUD – Housing and Urban Development
HVAC – Heating, Ventilating, and Air Conditioning
ITRR – Institute for Tourism & Recreation Research

LIST OF ACRONYMS (CONTINUED)

LANDFIRE – Landscape Fire and Resource Management Planning Tools Project
LP – Liquefied Petroleum (propane)
MATIC – Montana All Threat Intelligence Center
MCA – Montana Code Annotated
MCI – Mass Casualty Incident
MDT – Montana Department of Transportation
MRL – Montana Rail Link
MSU – Montana State University
NCDC – National Climatic Data Center
NIFC – National Interagency Fire Center
NIH – National Institutes of Health
NFIP – National Flood Insurance Program
NFP – National Fire Plan
NID – National Inventory of Dams
NOAA – National Oceanic and Atmospheric Administration
NP – National Park
NPMS – National Pipeline Mapping System
NRCS – Natural Resources Conservation Service
NRMRC – Northern Rocky Mountain Resource Conservation and Development
NTSB – National Transportation Safety Board
NWCC – National Water & Climate Center (USDA)
NWS – National Weather Service
OPEC – Organization of Petroleum Exporting Countries
PCB – Polychlorinated Biphenyls
PDM – Pre-Disaster Mitigation
PGA – Peak Ground Acceleration
RAWS – Remote Automated Weather Stations
RFA – Rural Fire Assistance
RFP – Request for Proposal
RFC – Repetitive Flood Claims
SARA – Superfund Amendment and Reauthorization Act
SARS – Severe Acute Respiratory Syndrome
SBA – Small Business Administration
SFHA – Special Flood Hazard Area
SHELDUS – Spatial Hazard Events and Losses Database for the United States
SRL – Severe Repetitive Loss
STAPLEE – Social, Technical, Administrative, Political, Legal, Economic, Environmental
URL – Uniform Resource Locator
USACE – United States Army Corps of Engineers
USDA – United States Department of Agriculture
USGS – United States Geological Survey
USFA – United States Fire Administration
USFS – United States Forest Service
VFA – Volunteer Fire Assistance
WMD – Weapons of Mass Destruction
WPDG – Wetland Program Development Grant
WUI – Wildland Urban Interface
YNP – Yellowstone National Park
YVO – Yellowstone Volcano Observatory

1.0 INTRODUCTION

Emergency management is typically divided into four interrelated actions: mitigation, preparedness, response, and recovery. This plan focuses on the mitigation phase only. Mitigation actions involve lasting, often permanent, reduction of, exposure to, probability of, or potential loss from hazard events. These actions tend to be centered on where and how to build, improvements and modifications (retrofits) to existing structures to increase resiliency, and management of potential hazards such as wildfire fuel mitigation activities. Examples include zoning and building code requirements for building or rebuilding in high hazard areas, floodplain buyouts, and prescribed forest management (burning and thinning). Mitigation also can involve educating businesses and the public on simple measures they can take to reduce loss and injury, like fastening bookshelves, water heaters, and file cabinets to walls to keep them from falling during earthquakes.

Cost-effective mitigation measures are the key to reducing disaster losses in the long term. In hazard-prone areas, mitigation can break the cycle of having to rebuild repeatedly with every recurrence of floods, wildfires, earthquakes, or other hazards. Where there is a willingness to mitigate, opportunities can be found. Ongoing efforts might include: educating the private sector about what it can do to mitigate at home and at work; reaching out to planning, zoning, and development agencies to ensure that hazard conditions are considered in comprehensive plans, construction permits, building codes, design approvals, etc.; and creating inventories of existing structures and their vulnerabilities, to aid mitigation planning. Planning is also needed to take advantage of mitigation opportunities in the aftermath of an emergency or disaster when hazard awareness is high, funds are possibly available, and disruption of the status quo makes it possible to rethink design and location of some facilities and infrastructure. Attention to mitigation opportunities can make safer communities. The HMP is a combined effort of Gallatin County; the cities of Bozeman, Belgrade, and Three Forks; the Towns of Manhattan and West Yellowstone; the community of Big Sky; Montana State University-Bozeman; and the public.

1.1 PURPOSE

Gallatin County recognizes that hazards, both natural and human-caused, threaten communities. Rather than wait until disaster strikes, the jurisdictions can take proactive measures to prevent losses and lessen the impact from these hazards. Actions taken to reduce or eliminate the long-term risk from hazards are defined as mitigation. Disaster mitigation is an investment that can save lives and money.

The purpose of this HMP is to:

- / Serve as a consolidated, comprehensive source of hazard information
- / Educate the communities, including government leaders and the public, on their vulnerabilities
- / Fulfill federal, state, and local hazard mitigation planning responsibilities
- / Prioritize and promote cost-effective mitigation solutions
- / Support requests for grant funding
- / Encourage long-term community sustainability

Effective mitigation planning promotes a broader understanding of the hazards threatening the communities and provides a clearer vision and competitive edge for future mitigation grant funding. By

integrating mitigation concepts into local thinking, the communities will find many more opportunities for disaster resistance beyond grant funding. For example, the consideration of disaster mitigation when designing subdivisions may include multiple access points or removal of drinking water wells from the floodplain that will provide greater disaster resistance, reduce future expenses and contribute to community sustainability.

The plan's intent is to assist the communities in making financial decisions for mitigation projects and clarify actions that could be taken through additional funding. Through an effective and inclusive planning process, communities will become more aware of their hazards and will take a proactive approach to disaster prevention and mitigation.

1.2 AUTHORITIES

The Gallatin County HMP was prepared in compliance with Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act), 42 U.S. C. 5165, enacted under Sec. 104 of the Disaster Mitigation Act of 2000 (DMA 2000), Public Law 106-390 of October 30, 2000, as implemented in Title 44, Chapter 1, Part 201 of the Code of Federal Regulations (CFR) dated October 2007, and most recently amended in October 2015. This legislation required all local governments to have an approved hazard mitigation plan in place to be eligible to receive Hazard Mitigation Grant Program (HMGP), Pre-Disaster Mitigation (PDM), and Flood Mitigation Assistance (FMA) funding, as well as other types of disaster and mitigation funding.

Gallatin County and the cities of Bozeman, Belgrade, and Three Forks, and the Towns of Manhattan and West Yellowstone have adopted this HMP by resolution (see **Appendix G** for copies of the resolutions). Montana State University - Bozeman has adopted the HMP and specifically, **Annex A**, which updates their 2013 PDM Plan, by executive letter (**Appendix G**). These governing bodies have the authority to promote mitigation activities in their jurisdictions. This plan is developed, promulgated, and maintained pursuant to the following state and federal statutes and regulations:

- / Code of Federal Regulations Title 44, Part 201, 205 and 206
- / Public Law 106-390, Disaster Mitigation Act of 2000
- / Public Law 93-288, The Disaster Relief Act of 1974, as amended by Public Law 100-707, the Robert T. Stafford Disaster Relief and Emergency Assistance Act
- / Public Law 96-342, Improved Civil Defense 1980
- / Public Law 99-499, Superfund Amendment and Re-authorization Act (SARA) of 1986, Title III, Emergency Planning Community Right-to-Know (EPCRA), Title 42, Chapter 116
- / Public Law 920, Federal Civil Defense Act of 1950, as amended
- / Public Law 105-19, Volunteer Protection Act of 1997
- / Response to Hazardous Materials Incidents, Title 10, Chapter 3, Part 12 MCA

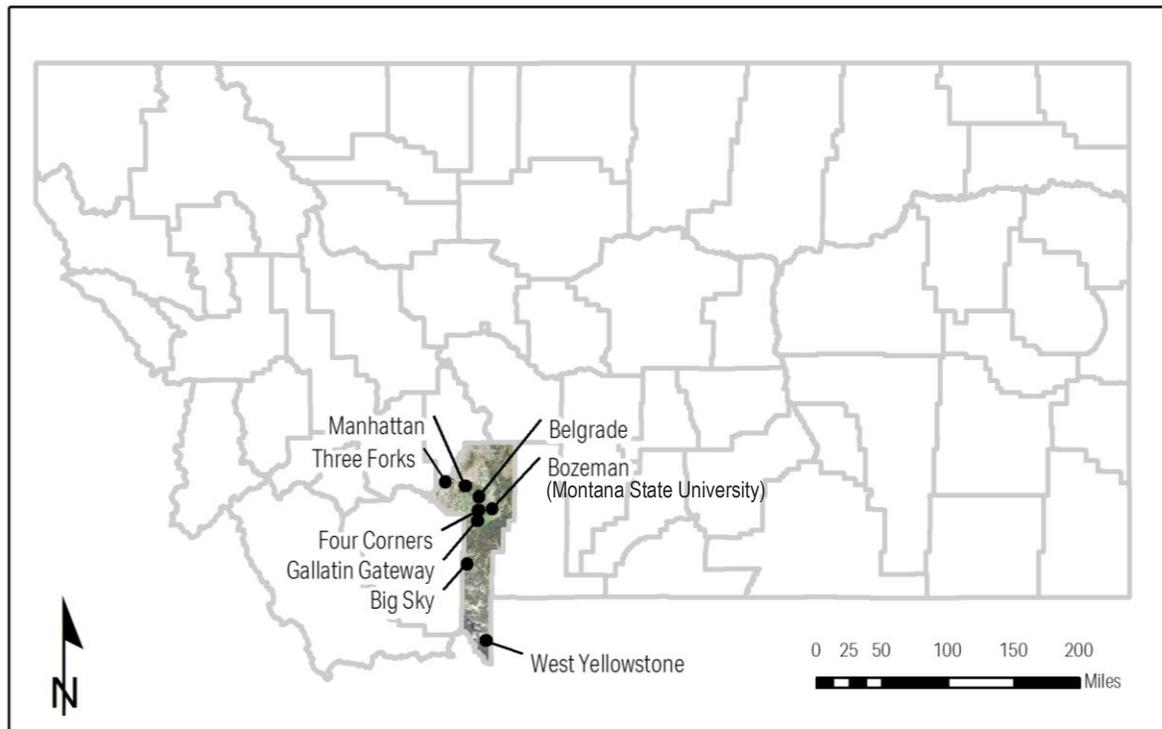
1.3 BACKGROUND

Gallatin County is located in southwest Montana as shown in **Figure 1-1**, with an area of approximately 2,631 square miles and elevations ranging from approximately 4,000 to 10,700 feet. Gallatin County is

bordered by Meagher County to the north, Park County to the east, Jefferson and Broadwater Counties to the northwest, Madison County to the west, and Yellowstone National Park to the southeast. The City of Bozeman is the county seat and other incorporated communities include the cities of Belgrade and Three Forks, and the Towns of Manhattan and West Yellowstone. The communities of Big Sky, Four Corners, and Gallatin Gateway represent other population centers.

Location

Gallatin County, Montana



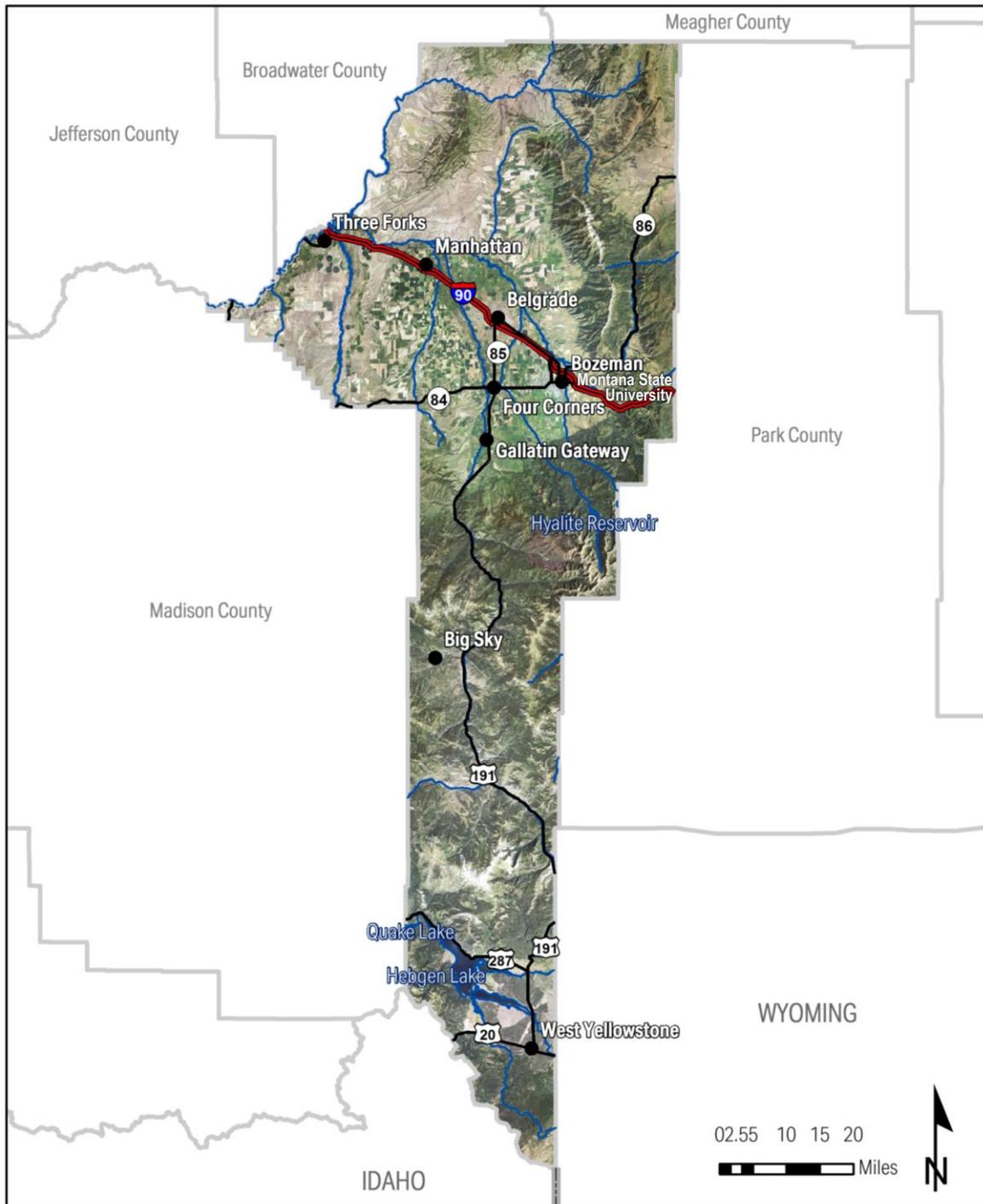
Data Source: Varied
Data Date: Varied
Map Coordinates: NAD 1983, State Plane Montana

Figure 1-1. Gallatin County Location

Figure 1-2 shows the general features in the county. Gallatin County covers over 2,500 square miles of land area varying in topography. Nearly half of all the land in Gallatin County is under public ownership by the USDA Forest Service, State of Montana, Bureau of Land Management, or the National Park Service. The county contains several mountain ranges which are marked by pristine rivers, creeks, and streams. The Gallatin River flows through Gallatin County from the top of the Gallatin Canyon through Belgrade and on to Manhattan and Three Forks where it flows into the headwaters of the Missouri River.

Features

Gallatin County, MT



Data Source: Montana NRIS
Data Date: August 2017
Mapp Coordinates: NAD 1983, State Plane Montana

Figure 1-2. Gallatin County Features

The climate of Gallatin County varies greatly. **Table 1-1** details the climate statistics recorded by four weather stations positioned within the county.

Table 1-1. Gallatin County Climate Statistics [Western Regional Climate Center, 2017]

	Montana State University 1982 - 2016	Belgrade (Bozeman-Yellowstone Int'l Airport) 1941 - 2016	Trident 1922 - 2016	West Yellowstone 1924 - 2013
Annual Average Maximum Daily Temperature	55.2°F	56.0°F	60.2°F	50.3°F
Annual Average Minimum Daily Temperature	31.2°F	28.2°F	32.0°F	19.6°F
Annual Average Total Precipitation	18.48 inches	13.92 inches	12.43 inches	21.56 inches
Annual Average Total Snowfall	86.0 inches	47.0 inches	28.5 inches	160.10 inches
Highest Temperature Recorded	105°F July 31, 1892	106°F July 6, 2007	109°F July 22, 1931	97°F July 19, 1936
Lowest Temperature Recorded	-43°F February 8, 1936	-46°F January 26, 1957	-55°F December 31, 1927	-66°F February 9, 1933
Annual Average Number of Days Dropping Below Freezing	181.7 days	199.3 days	172.2 days	270.7 days
Annual Average Number of Days Staying Below Freezing	48.0 days	51.9 days	33.6 days	87.8 days
Annual Average Number of Days Reaching 90°F or Higher	7.4 days	19.8 days	31.3 days	2.2 days
Highest Annual Precipitation	25.57 inches 1997	20.04 inches 1969	20.96 inches 1997	29.32 inches 1955
Lowest Annual Precipitation	10.54 inches 1934	8.65 inches 1961	6.42 inches 1974	15.68 inches 1934
1-Day Maximum Precipitation	2.68 inches May 7, 1988	2.14 inches June 25, 1969	2.00 inches May 25, 1980	2.70 inches June 17, 1925
Highest Annual Snowfall	159.5 inches 1975	87.4 inches 1955	75.0 inches 1989	276.1 inches 1994

1.4 PLAN SCOPE AND ORGANIZATION

The Gallatin County HMP is organized into sections that describe the planning process (Section 2.0), assets and community inventory (Section 3.0), risk assessment/hazard profiles (Section 4.0), mitigation strategies (Section 5.0), and plan maintenance (Section 6.0). Appendices containing supporting information are included at the end of the plan.

Montana State University- Bozeman has elected to update their 2013 PDM Plan as an annex to the 2018 Gallatin County HMP. The MSU Emergency Management Coordinator, as well as other MSU representatives, participated in the county HMP update process, and conducted their own risk assessment (hazard identification/ranking) and developed a mitigation strategy specific to the university.

This plan, particularly the risk assessment section, outlines each hazard in detail and how it may affect Gallatin County. The mitigation strategy outlines long-term solutions to possibly prevent or reduce future damages. Additional hazards may exist that were not apparent to local government or participants through the development of this plan, and certainly, disasters can occur in unexpected ways. Although any and all hazards cannot be fully mitigated, this plan will help the communities understand the hazards better and become more disaster resistant and resilient.

2.0 PLANNING PROCESS AND METHODOLOGIES

Mitigation planning is a community effort and takes time and expertise. For Gallatin County, an effective hazard mitigation plan requires input from a variety of stakeholders, including elected officials, first responders, emergency management, healthcare providers, public works, road officials, state and federal agencies, businesses, non-profit organizations, academia, and the public. After a disaster, many of these stakeholders will be overwhelmed with recovery responsibilities. Therefore, planning for mitigation and involving as many stakeholders as possible before a disaster strikes will make mitigation activities easier after a disaster and may even prevent the disaster in the first place.

2.1 INITIAL PLANNING PROCESS

The planning process for the county's first hazard mitigation plan began in January 2001 with an advertised public meeting that was held to kick-off original Project Impact efforts. Over several years, Project Impact was phased out and the Gallatin County All Hazards All Disciplines (AHAD) group became the primary guiding body for HMP development. The AHAD group consists of representatives from local emergency management, fire services, medical and health services, law enforcement, media, public individuals, voluntary organizations, and government administration.

Meetings were held throughout 2004 and 2005 with the AHAD group for the purposes of identifying critical facilities, reviewing draft sections, and developing mitigation strategies. Once draft sections were completed, they were distributed over e-mail for review. The full draft of the HMP was posted on the GCEM website to solicit public review and comment. Final public requests soliciting comments on the full draft plan were posted in February 2006, with final plan adoption later that year.

In 2011, the 5-year plan revision process was initiated with public stakeholder meetings. This process culminated in an updated HMP that was approved by FEMA on September 18, 2012.

2.2 PLAN UPDATE PROCESS

In 2017, Gallatin County once again prepared to update the HMP, through issuance of a Request for Proposals (RFP). A local consultant, RESPEC Inc., was hired to facilitate the plan update for Gallatin County. RESPEC provided experience in hazard mitigation and emergency management and coordinated the planning process in partnership with the county, cities, towns, MSU-Bozeman, and community at large. GCEM acted as the main governmental entity responsible for management and maintenance of the HMP. The AHAD group once again served as the primary forum for HMP update participation and review via presentations of plan status and solicitation of comments and input.

The 2018 Plan update builds on the original 2006 plan and the updated 2012 plan with revised data for each of the defined hazards, and an updated and reprioritized list of goals and actions to mitigate identified risks. These risks were discussed with community members in several public meetings held across the county. HAZUS-MH 4.2 and other GIS data were used to provide updated maps as well as data.

The plan update process consisted of the following steps:

1. Initial review of the existing plan was undertaken by the contractor.
2. A proposed outline for the updated plan was developed.
3. Initial public meetings were held to inform the public on the upcoming plan update, and to solicit preliminary comments. The meetings were advertised in the Bozeman Daily Chronicle, on the GCEM website, and invitations were sent directly to identified stakeholders.
4. Subsequent public meetings were held to solicit comment on the existing plan, to determine what changes and accomplishments have taken place in the county and the jurisdictions over the past five years, and to brainstorm ideas (new hazards, mitigation strategies) for the updated version.
5. The Mitigation Strategy and remaining sections were updated.
6. Stakeholders were asked to review the draft plan and provide comments.
7. The Draft Final plan update, including the MSU Annex, was posted on the GCEM website for review and comment.
8. Following the public comment period, any comments received were incorporated and the final plan was sent to the state and FEMA for review.
9. Jurisdictions adopted the updated plan, either before or immediately after state and FEMA conditional approval.

2.2.1 COMMUNITY CHANGES

A driving force in updating this type of plan involves the changes that have occurred in the community over the past five years. Perhaps the biggest change in Gallatin County has been the significant increase in population and the associated commercial and residential housing growth. According to U.S. Census estimates, the Gallatin County population increased by 25% between 2010 and 2018, placing it among the fastest-growing counties in the nation [U.S. Census Bureau, 2018a].

2.2.2 PLAN CHANGES

Another principal component to updating the plan is adherence to the latest requirements for HMP development, as provided by the federal government. Compliance requires periodic additions and changes to the plan. Some of these changes were proposed and made by the contractor and reviewed by the communities. Other changes were proposed by community members and included where applicable. Data, methods, and information used in the initial 2006 HMP and the 2012 HMP update were reviewed by the contractor and changes made where updated information was available. Other items, such as mitigation actions and plan maintenance procedures, were reviewed by local individuals and changes made as necessary. **Appendix D** provides a summary of HMP changes completed with this 2018 update.

This 5-year plan review featured updates to all sections to improve readability, usability, and methodologies. Specifically, the following major changes were part of the plan's update:

- / Addition of an Executive Summary
- / Updated description of the planning process, to include this 2018 revision and the MSU Annex
- / One new hazard was identified (Environmental Hazards); several others were modified and/or combined, or segregated into separate hazards
- / Updated Geographic Information System (GIS) mapping was added
- / The Community Inventory included sections specific to critical facilities and infrastructure, population, structures, and economic, ecologic, historic, and social values

- / New mitigation goals and strategies were added, some were modified, and others removed to reflect current conditions and completion of mitigation actions from the previous plan
- / New appendices were added, as necessary

2.2.3 JURISDICTION PARTICIPATION

This plan includes the following communities and jurisdictions:

- | | |
|------------------------|---------------------------------------------------------|
| / Gallatin County | / Town of Manhattan |
| / City of Belgrade | / City of Three Forks |
| / Community of Big Sky | / Town of West Yellowstone |
| / City of Bozeman | / Montana State University – Bozeman (Annex A) |

Each jurisdiction participated in a variety of ways depending on the resources that were available. Gallatin County applied for, received, and managed the funding for the plan update. Representatives from several county offices were active in all aspects of the plan’s update. The cities and towns participated in the plan’s update by sending representatives to public meetings, discussing elements of the plan at the public meetings and with the contractor, providing information and comments to the contractor when requested, hosting public meetings, and reviewing the draft plan. **Appendix C** provides copies of sign in sheets for the plan revision process. The MSU Emergency Management Coordinator participated in the county HMP update process; MSU also conducted their own risk assessment (hazard identification/ranking) and developed a mitigation strategy specific to the university. **Appendix B** provides a general list of project stakeholders; stakeholder participation invitation letters; community letters and e-mail notices for public meetings; legal order confirmation; and e-mail announcements and GCEM webpage postings used to solicit comments and feedback for draft versions of the HMP.

2.2.4 NEIGHBORING COMMUNITIES

Representatives from Broadwater, Madison and Park counties were invited to participate in the planning process via personal letter and attended at least one meeting. Invitation letters were not sent to representatives in either Jefferson or Meagher counties, and no one participated in the planning process from those jurisdictions. It is noted that both Jefferson and Meagher counties have relatively small borders with Gallatin County with no primary connecting roads and limited interaction.

2.2.5 PUBLIC PARTICIPATION

To encourage public interaction and participation in plan content and development, the county was divided into five districts which cover the following areas (refer to **Figure 2-1**):

- / District 1: Hebgen Basin – West Yellowstone – Yellowstone National Park
- / District 2: Big Sky – Taylor Fork
- / District 3: Bozeman – Four Corners (S & E) – Gallatin Gateway – Hyalite – Bear Canyon – Bozeman Pass – Bridger Canyon – Sedan
- / District 4: Belgrade – Four Corners (N & W) – Dry Creek – Springhill – Menard - Maudlow – North Bridger
- / District 5: Cherry Creek – Amsterdam/Churchill – Manhattan – Three Forks – Willow Creek – Madison River – Trident/Clarkston

Initial public meetings were held in each district in October 2017 at the following locations – West Yellowstone, Big Sky, Gallatin Gateway, Bozeman, Belgrade, Manhattan, and Three Forks. Follow-up meetings were held in February 2018 in the same locations, excluding Gallatin Gateway and Manhattan (lists of meeting attendees for both the October 2017 and February 2018 public meetings are provided in **Appendix C**). The completed draft document was posted on the GCEM website in Spring 2019. Public comments could be provided by email or via an online form for comments available on the GCEM website. Any comments received were reviewed and integrated where applicable. Comments were readily accepted throughout the planning process.

Since county commission and town council meetings are also open public meetings, the discussions and subsequent adoption of the plan by the governing bodies provided additional opportunities for public comment. The jurisdictions advertised these meetings using their usual public notification procedures, typically by posting meeting agendas on their websites, in local newspapers, and at the meeting locations.

All jurisdictions adopted the plan through resolution or executive letter upon completion.

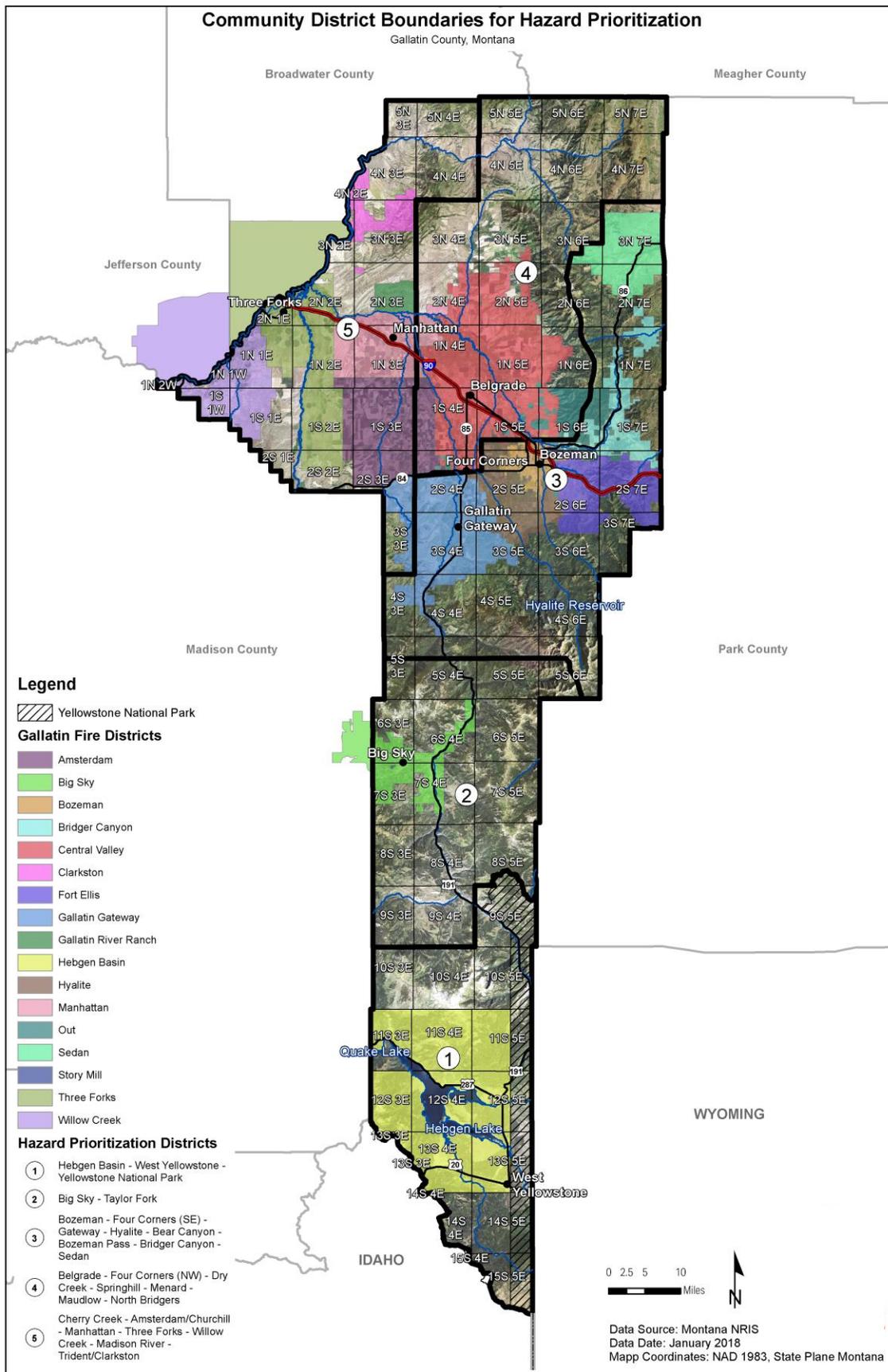


Figure 2-1: Community District Boundaries for Hazard Prioritization

2.2.6 INCORPORATION OF EXISTING INFORMATION

Information from existing plans, studies, reports, and technical information related to hazards, mitigation, and community planning were gathered via personal contact throughout the planning process, and by reviewing the 2006 and 2012 plans. Many national and state plans, reports, and studies provided background information. Data processing and map production was completed by RESPEC using information collected from a wide variety of sources, including the 2006 and 2012 HMPs and subject matter experts. The information was organized into a clear, usable, and maintainable format for the county ensuring that federal regulations regarding hazard mitigation plans were met. A list of existing local plans and documents that were evaluated as part of plan development is included in **Table 2-1. Appendix A** includes a list of reference sources for information accessed and included in the HMP.

Table 2-1. Existing Local Plans and Documents Incorporated

Plan/Report/Study Name	Plan/Document Date
Gallatin County Growth Policy	2003 (currently being updated with expected completion in 2021)
Gallatin County Subdivision Regulations	March 2019
City of Bozeman Capital Improvements Program (FY 2018 – 2022)	February 2017
Prospera Economic Profile of Gallatin and Park Counties	2017 and 2018
Bozeman Municipal Code	January 2018
Bozeman Community Plan (Growth Policy)	June 2009 (update to Plan is being finalized in 2019)
Bozeman Unified Development Code	March 2018
Belgrade Growth Policy	October 2006 (update to Growth Policy to be completed in 2019)
West Yellowstone Growth Policy	2017
Manhattan Municipal Code	updated April 2018
Belgrade Municipal Code	2009
Three Forks Municipal Code	updated September 2018
West Yellowstone Municipal Code	updated September 2018
City of Bozeman Drought Management Plan	January 2017
Gallatin County Hazardous Materials Plan	April 2009
Gallatin County Emergency Management Plan	January 2017
Gallatin Triangle Planning Study	September 2014
Greater Bozeman Area Transportation Plan (2007 Update)	2007
Bozeman Transportation Master Plan	April 2017
Belgrade to Bozeman Corridor, Frontage Road Study	May 2017
City of Bozeman Climate Vulnerability Assessment and Resiliency Strategy	April 2019

The Gallatin County HMP is a living, expandable document that can have new information added and changes made as needed. The plan’s purpose is to improve disaster resistance through projects and programs, and therefore, opportunities for changes and public involvement will exist as disasters occur and mitigation continues. Details on the plan’s maintenance and continued public involvement are further outlined in Section 6.0 – Plan Maintenance.

2.3 RISK ASSESSMENT METHODOLOGIES

A key step in preventing disaster losses in Gallatin County and the incorporated jurisdictions is developing a comprehensive understanding of the hazards that pose risks to the communities. The following terms [FEMA, 2001] can be found throughout this plan:

- / **Hazard:** A source of danger
- / **Risk:** Probability of loss or injury
- / **Vulnerability:** Open to attack or damage

This all-hazard risk assessment and mitigation strategy serves as an initial source of hazard information for those in Gallatin County. Other plans may be referenced and remain vital hazard documents, but each hazard has its own profile in this plan. As more data become available and disasters occur, the individual hazard profiles and mitigation strategies can be expanded, or new hazards added. This risk assessment identifies and describes the hazards that threaten the communities and determines the values at risk from those hazards. The risk assessment is the cornerstone of the mitigation strategy and provides the basis for many of the mitigation goals, objectives, and potential projects.

The assets and community inventory section includes elements such as critical facilities, critical infrastructure, population, structures, economic values, ecologic values, historic values, social values, current land uses, new development, and future development potential. The list of critical facilities and infrastructure included in the previous HMP were reviewed and updated to reflect current locations and status of these assets.

Individual hazard profiles allow for comprehensive analysis of each hazard from many different aspects. Each hazard profile contains a description of the hazard containing information from specific hazard experts and a record of the hazard history compiled from a wide variety of databases and sources.

Using local historical occurrence, or more specific documentation if available, a probability was determined. In most cases, the number of years recorded was divided by the number of occurrences, resulting in a simple past-determined recurrence interval. If the hazard lacked a definitive historical record, the probability was assessed qualitatively based on regional history or other contributing factors. The magnitude or extent of the hazard describes a realistic approximation of the worst-case scenario. This qualitative approximation is based on past occurrences in the county or in nearby counties. If the past occurrence was not an accurate representation, general knowledge of the hazard was used to approximate the types of impacts that are expected from a low-frequency, high-magnitude event.

Mapping of the hazards, where spatial differences exist, allows for hazard analyses by geographic location. Some hazards, such as riverine flooding, can have varying levels of risk based on location (i.e., near the river versus far away from the river). Other hazards, such as winter storms or drought, cover larger geographic areas and delineation of hazard areas is not typically available or useful on the county scale.

Critical facilities were mapped using data provided by Gallatin County. The mapping of the facilities allowed for the comparison of building locations to the hazard areas where such hazards are spatially recognized. Base maps depicting the critical facility locations were compared to available hazard layers to show the proximity of the facilities to the hazard areas. Given the nature of critical facilities, the functional losses and costs for alternate arrangements typically extend beyond structural and contents losses. These types of losses can be inferred based on the use and function of the facility.

Critical infrastructure for services such as electricity, heating fuels, telephone, water, sewer, and transportation systems was assessed in a narrative format using history and a general understanding of such systems to determine what infrastructure losses may occur. Basic mapping exists of the road networks in the county. These layers were additionally compared to the hazard areas. Most of the other types of infrastructure do not have digital mapping or were withheld by the managing company for security reasons.

Structures were mapped and analyzed in a similar manner to critical facilities. Data showing the locations of most structures countywide was provided by Madison and Gallatin counties. This GIS mapping allowed for comparison of building locations to the mapped hazard areas. Using this technique, an approximate number of structures in the various hazard areas can be determined. The value of structures in the hazard areas was determined using Montana Department of Revenue Computer Assisted Mass Appraisal System (CAMA) data that contains the taxable building value of each parcel in the county. The structure points provided by the counties were matched with the closest taxable building values. For some hazards, the total dollar exposure was multiplied by a damage factor since many hazard events will not result in a complete loss of all structures. These estimates are general in nature, and therefore, should only be used for planning purposes. The approximations, however, are based on current hazard and exposure data. HAZUS-MH 4.2, a loss estimation software program developed by FEMA, approximated losses to structures from earthquakes and floods. Where GIS mapping was unavailable or not useful, estimations and plausible scenarios were used to quantify potential structure losses.

Population impacts were qualitatively assessed based on the number of structures estimated to be in the hazard area. Given 49,444 housing units and a population of 107,810, both based on 2017 U.S. Census data (U.S. Census, 2017), an estimate of 2.2 people per structure was derived. Depending on the time of year, population concentrations are likely much greater due to non-resident populations. Other factors used in evaluating the population impacts included the ability of people to escape from the incident without casualty and the degree of warning that could be expected for the event. In general, the loss of life and possible injuries are difficult to determine and depend on the time of day, day of the week, time of year, extent of the damage, and other hazard specific conditions.

Qualitative methodologies, such as comparisons to previous disasters, occurrences in nearby communities, and plausible scenarios, helped determine the potential losses to economic, ecologic, historic, and social values. In many cases, a dollar figure cannot be placed on values, particularly those that cannot be replaced. Therefore, these types of losses were quantified through narrative descriptions and provide some background on what may occur during a disaster.

The assessment on the impact to future development is based on the mechanisms currently in place to limit or regulate development in hazardous areas. Some hazards can be mitigated during development, others cannot. The impacts were assessed through a narrative on how future development could be impacted by the hazard based on current regulations.

Many unknown variables limit the ability to quantitatively assess all aspects of a hazard with high accuracy. Therefore, data limitations provide a framework for identifying the missing or variable information. These limitations were determined by hazard through the risk assessment process. In some cases, the limitations may be resolved through research or data collection. If a limitation can be reasonably resolved

through a mitigation project, the resolution is included as a potential action in the mitigation strategy. Other factors were determined based on an evaluation of past events and a general understanding of the hazard characteristics. This basic listing of secondary hazards provides a link between the hazard profiles and identifies additional hazards that may compound the impacts of the primary event (i.e., poor air quality because of smoke during a wildland fire).

At the end of the risk assessment, the summary brings together data from each of the hazards to show comparisons and ultimately rank the hazards by jurisdiction. The overall hazard rating is determined using qualitative rankings of the probability of future occurrences and likely impacts when compared to other hazards.

Due to the inherent errors possible in any disaster risk assessment, the results of the risk assessment should only be used for planning purposes and in developing projects to mitigate potential losses.



Photos courtesy Gallatin County Emergency Management.

3.0 RISK ASSESSMENT AND COMMUNITY INVENTORY

This hazard risk assessment serves as a single source for hazard information in Gallatin County. Other plans may be referenced and remain vital hazard documents, but each hazard has its own profile in this plan. As more data becomes available and disasters occur, the individual hazard profiles can be updated, or new hazards can be added. This summary of hazards identifies and describes the hazards that threaten Gallatin County, including Belgrade, Big Sky, Bozeman, Manhattan, Three Forks and West Yellowstone, and determines the values at risk from those hazards. The risk assessment is the cornerstone of the mitigation strategy and provides the basis for many of the proposed actions.

3.1 HAZARD IDENTIFICATION

Gallatin County is exposed to many hazards. The hazards were identified and profiled through several different means. Hazards were initially identified by participants in the first round of public meetings. Participants represented governmental agencies, private sector interests, and the general public. Subsequently, a history of past events was compiled, and possible future events were recognized through internet research, available GIS data, archives research, public meetings, subject matter experts, and an examination of existing plans. The identified hazards were validated and ranked at public meetings held in February 2018. As might be expected, many of the hazard types were common to each community district; however, several hazards were either unique to a district, or were not common to all five districts. MSU completed their own hazard identification and ranking process, the results of which can be found in **Annex A**.

Overall, 19 major hazards with respect to risk and vulnerabilities were selected for assessment at a countywide-level. The 2012 Gallatin County HMP identified 16 hazard descriptions. A summary of the changes in countywide hazard identification includes:

- / The 2012 HMP included a single hazard for **Civil Unrest, Terrorism, and Violence**; whereas this 2018 update broke out each of these topics into separate hazards.
- / The 2012 HMP included separate categories for different, seasonal weather hazards under the titles of **Severe Thunderstorms and Tornadoes** and **Winter Storms and Extreme Cold**. This 2018 update combined weather hazards into a single title – **Severe Weather**.
- / The 2012 HMP included a **Utility Outage** hazard. This 2018 update changed the title of that hazard to **Critical Infrastructure Disruption**, with the intention of capturing not only interruptions to traditional utility networks (electrical, natural gas, petroleum, water and wastewater), but also the more recently developed cybernetworks (Internet, WiFi) and mobile communication systems (cellular phone networks, satellite-based communication).
- / Two new hazards were identified for inclusion in the 2018 HMP update: **Environmental Hazards** which includes air and water quality, and **Urban Conflagration** which includes large-scale, rapid fire development in urban settings resulting from an explosion, structure fire, or wildfire event due to lighter weight building materials and newer construction methods.

The hazards (in alphabetical order) are listed in **Table 3-1**. The jurisdictions affected, and brief descriptors of how and why the hazard was identified, are provided in this table. The level of detail for each hazard is based on the relative risk to the effected communities and is limited by the amount of data available.

Table 3-1. Gallatin County Hazards

Hazard	Jurisdiction	How Identified	Why Identified
Avalanche and Landslide	/ Gallatin County	<ul style="list-style-type: none"> / State DES Website / Historical records from the avalanche.org database / Colorado Avalanche Info. Center / Montana Hazard/Vulnerability Analysis (1989) / USGS National Landslide Study / Montana Department of Transportation District 2 Priorities / Public meeting input / 2018 HAZUS-MH study 	<ul style="list-style-type: none"> / Potential for landslides and avalanches due to varied terrain / History of fatal avalanches / 2005 HAZUS study identified areas of significant landslide risk
Aviation Accident	<ul style="list-style-type: none"> / Gallatin County / All Incorporated Cities and Towns 	<ul style="list-style-type: none"> / Federal Aviation Administration / National Transportation Safety Board 	<ul style="list-style-type: none"> / Potential for mass casualty incident / Increased aircraft traffic at Bozeman-Yellowstone International Airport
Civil Unrest	<ul style="list-style-type: none"> / Gallatin County / All Incorporated Cities and Towns 	<ul style="list-style-type: none"> / State Dept. of Justice website / Public meeting input 	<ul style="list-style-type: none"> / Potential for organized demonstrations and protests to cause significant disruptions to daily activities
Communicable Disease and Bioterrorism	<ul style="list-style-type: none"> / Gallatin County / All Incorporated Cities and Towns 	<ul style="list-style-type: none"> / Centers for Disease Control and Prevention website / Public meeting input / Local Health Department 	<ul style="list-style-type: none"> / Large number of livestock areas / History of an influenza outbreak / The area is highly traveled by tourists / Rapid disease spread potential through urban areas
Critical Infrastructure Disruption	<ul style="list-style-type: none"> / Gallatin County / All Incorporated Cities and Towns 	<ul style="list-style-type: none"> / Public meeting input / Subject matter experts 	<ul style="list-style-type: none"> / Dependence of population on utility services
Dam Failure	<ul style="list-style-type: none"> / Gallatin County / Belgrade, Three Forks 	<ul style="list-style-type: none"> / National Inventory of Dams website / Dam Emergency Action Plans 	<ul style="list-style-type: none"> / Several high hazard dams and several significant hazard dams exist in the county
Drought	<ul style="list-style-type: none"> / Gallatin County / All Incorporated Cities and Towns 	<ul style="list-style-type: none"> / Montana Drought Advisory / National Drought Mitigation / Data from the Western Regional Climate Center / NOAA Paleoclimatology 	<ul style="list-style-type: none"> / Frequent historical drought events / USDA Disaster Declarations / Importance of agriculture to the local economy
Earthquake	<ul style="list-style-type: none"> / Gallatin County / All Incorporated Cities and Towns 	<ul style="list-style-type: none"> / Montana Bureau of Mines and Geology / US Geological Survey / 2018 HAZUS-MH Study 	<ul style="list-style-type: none"> / History of nearby earthquakes greater than 6.0 magnitude / Proximity to the active geological region of Yellowstone National Park / Numerous active faults in and adjacent to Gallatin County / 2018 HAZUS-MH scenarios defined a significant hazard

Hazard	Jurisdiction	How Identified	Why Identified
Environmental Hazards	<ul style="list-style-type: none"> / Gallatin County / All Incorporated Cities and Towns 	<ul style="list-style-type: none"> / Montana Dept. of Environmental Quality / U.S. Environmental Protection Agency / Public meeting input 	<ul style="list-style-type: none"> / Recent increases in air quality impacts due to wildfires / Surface and groundwater contamination potential
Flooding	<ul style="list-style-type: none"> / Gallatin County / All Incorporated Cities and Towns 	<ul style="list-style-type: none"> / FEMA; Flood Insurance Rate Maps (FIRMs) / US Army Corp of Engineers / GCEM 	<ul style="list-style-type: none"> / History of flooding / Large areas of identified floodplain in developed areas
Ground Transportation Accident	<ul style="list-style-type: none"> / Gallatin County / All Incorporated Cities and Towns 	<ul style="list-style-type: none"> / National Transportation Safety Board / Montana Highway Patrol / Federal Railroad Administration / Montana Department of Transportation 	<ul style="list-style-type: none"> / Heavily traveled Interstate 90 and Highway 191 traverse the county / History of small transportation accidents / Potential for larger transportation accidents causing mass casualties
Hazardous Materials Release	<ul style="list-style-type: none"> / Gallatin County / All Incorporated Cities and Towns 	<ul style="list-style-type: none"> / Gallatin County Hazardous Material Plan / Environmental Protection Agency / US Department of Transportation Emergency Response Handbook 	<ul style="list-style-type: none"> / Fixed facilities exist in the county that house hazardous materials / Regular highway and railroad traffic transport of hazardous materials / History of hazardous material releases
Railroad Accident	<ul style="list-style-type: none"> / Gallatin County / Belgrade, Bozeman, Manhattan, and Three Forks 	<ul style="list-style-type: none"> / Montana Rail Link flow study / Public meeting input / U.S. Dept. of Transportation 	<ul style="list-style-type: none"> / Significant rail traffic through county with potentially hazardous cargo
Severe Weather	<ul style="list-style-type: none"> / Gallatin County / All Incorporated Cities and Towns 	<ul style="list-style-type: none"> / National Climatic Data Center database / National Weather Service / Storm Prediction Center 	<ul style="list-style-type: none"> / History of severe weather events, including damages
Terrorism	<ul style="list-style-type: none"> / Gallatin County / All Incorporated Cities and Towns 	<ul style="list-style-type: none"> / Bureau of Alcohol, Tobacco & Firearms / Federal Bureau of Investigation / Gallatin Co. Emergency Operations Plan / Southern Poverty Law Center website / Anti-Defamation League website 	<ul style="list-style-type: none"> / Heightened alert since September 11, 2001 / Small scale incidents have occurred in Gallatin County / Proximity to Yellowstone National Park and National Forest lands
Urban Conflagration	<ul style="list-style-type: none"> / Gallatin County / All Incorporated Cities and Towns 	<ul style="list-style-type: none"> / Local fire departments, districts and fire service areas 	<ul style="list-style-type: none"> / Increased urbanization and development densities combined with lighter weight home construction materials
Violence	<ul style="list-style-type: none"> / Gallatin County / All Incorporated Cities and Towns 	<ul style="list-style-type: none"> / Local law enforcement / Public meeting input 	<ul style="list-style-type: none"> / Rapid increases in population / Increased drug traffic and general crime within county
Volcano	<ul style="list-style-type: none"> / Gallatin County / All Incorporated Cities and Towns 	<ul style="list-style-type: none"> / Yellowstone Volcano Observatory / Montana Disaster and Emergency Services 	<ul style="list-style-type: none"> / Proximity to active volcanic caldera / History of ash fall over the county
Wildfire	<ul style="list-style-type: none"> / Gallatin County / All Incorporated Cities and Towns 	<ul style="list-style-type: none"> / Montana Department of Natural Resources and Conservation / US Forest Service / Gallatin County Community Wildfire Protection Plan (CWPP) 	<ul style="list-style-type: none"> / Local history of wildfire / Numerous areas of Wildland-Urban Interface (WUI)

3.2 ASSETS AND COMMUNITY INVENTORY

An important piece of assessing the risk of the communities to the studied hazards is to recognize what assets are more vulnerable to those hazards than others. Identifying the assets in the communities is the first step in assessing the vulnerabilities to those assets. In many cases, once important facilities are identified, they can then be prioritized for mitigation. Examples of community assets include the population, critical facilities, government (publicly owned) facilities, businesses, residences, structures housing vulnerable populations, road and utility infrastructure, natural resources, and the economy. The most important facilities typically protect the continuity of government, the safety of the population, or the economy.

3.2.1 CRITICAL FACILITIES AND INFRASTRUCTURE

Critical facilities and infrastructure protect the safety of the population, the continuity of government, or the values of the community. In many cases, critical facilities fulfill important public safety, emergency response, and/or disaster recovery functions. In other cases, critical facilities may protect a vulnerable population, such as a school or elder care facility. Examples of critical facilities include: 911 emergency call centers, coordination centers, police and fire stations, public works facilities, sewer and water facilities, hospitals, jails, schools, essential businesses, shelters, and public services buildings. The transportation network is another important infrastructure that relies on bridges and road/rail segments.

Utilities such as electricity, natural gas/propane, telephone, water, and sewer rely on established infrastructure to provide services. The providers of these services use a variety of systems to ensure consistent service in the county. Each of these services is important to daily life in Gallatin County and, in some cases, is critical to protecting life and property.

3.2.1.1 CRITICAL FACILITIES

Critical facilities were initially identified throughout the planning process for the 2006 and 2012 plans and then reviewed and updated in 2018. These facilities are listed below in **Table 3-2** through **Table 3-10**. Critical facility locations are shown in **Figure 3-1** through **Figure 3-8**.

Table 3-2. Critical Facilities - Local Government and Law Enforcement

Name	Address	Replacement Value
Law & Justice Center	615 S. 16 th Bozeman	
Gallatin County Courthouse	311 West Main Bozeman	
Bozeman City Hall	121 North Rouse Bozeman	
Gallatin County Fairgrounds	901 North Black Bozeman	
Montana State University Police	Roy Huffman Building, 7 th & Kagy Bozeman	\$1,492,000
Gallatin County Coordination Center	219 East Tamarack Bozeman	
Gallatin County Emergency Communications Center	1705 Vaquero Parkway Bozeman	
Belgrade City Hall	91 E. Central Belgrade	\$1,600,000

Name	Address	Replacement Value
Manhattan City Hall	207 S. 6 th St. Manhattan	\$225,000
Three Forks City Office	206 Main Three Forks	
West Yellowstone Police	124 Yellowstone Avenue West Yellowstone	

Table 3-3. Critical Facilities – Fire and Emergency Medical Service (EMS) Stations

Name	Address	Replacement Value
Bozeman Fire Department Station #1	34 N. Rouse Bozeman	\$646,000
Bozeman Fire Department Station #2	410 S. 19th Bozeman	\$263,000
Bozeman Fire Department Station #3	1705 Vaquero Parkway Bozeman	
Amsterdam Fire District	7170 Church Hill Rd. Amsterdam	\$150,000
Bridger Canyon Fire District	8081 Bridger Canyon Rd. Bozeman	\$250,000
Central Valley Fire District #1	215 Wings Way Belgrade	\$8,000,000
Central Valley Fire District #2	3650 Springhill Rd. Bozeman	\$750,000
Central Valley Fire District #3	275 Ice Center Lane Bozeman	\$300,000
Central Valley Fire District #4	13683 Springhill Rd. Belgrade	
Central Valley Fire District #5	9600 Walker Rd. Belgrade	
Central Valley Fire District #6	370 Pollywog Lane Belgrade	
Central Valley Fire District #7	8977 Dry Creek Rd. Belgrade	
Fort Ellis Fire Service Area	3725 Bozeman Trail Rd. Bozeman	\$100,000
Gallatin Gateway Fire District	320 Webb Street Gallatin Gateway	
Hyalite Fire Department #1	4541 S. 3 rd Rd. Bozeman	
Hyalite Fire Department #2	10200 Cottonwood Rd. Bozeman	
Hyalite Fire Department #3	5400 Gooch Hill Rd. Bozeman	
Manhattan Fire District	222 E. Main St. Manhattan	

Name	Address	Replacement Value
Three Forks Fire District	13 E. Date St. Three Forks	\$100,000
Hebgen Basin Rural Fire District	10 S. Faithful Street West Yellowstone	
Willow Creek Fire District	107 Main Willow Creek	\$90,000
Big Sky Fire Station #1	650 Rainbow Trout Run Big Sky	
Big Sky Fire Station #2	460 Lone Mountain Trail Big Sky	\$500,000
Gallatin River Ranch Fire District	Equestrian Center Loop Manhattan	\$130,000
Bozeman-Yellowstone International Airport Fire Station	780 Gallatin Field Rd. Belgrade	\$156,000
Clarkston Fire Service Area	12455 Clarkston Rd. Three Forks	\$100,000

Table 3-4. Critical Facilities - Hospitals and Clinics

Name	Address	Replacement Value
Bozeman Health Deaconess Hospital	905 – 931 Highland Blvd. Bozeman	\$20,400,000
Bozeman Health Belgrade Clinic	206 Alaska Frontage Rd. Belgrade	
Bozeman Health Big Sky Medical Center	334 Town Center Avenue Big Sky	
Bozeman Health Big Sky Mountain Clinic	100 Beaverhead Trail Big Sky	\$3,000,000
Bozeman Health Outpatient Services	120 N. 19 th Suite D Bozeman	\$506,000
Bozeman Health Urgent Care	1006 W. Main St. Bozeman	\$912,000
Gallatin Community Clinic	214 E. Mendenhall Bozeman	\$376,000
Gallatin County Health Department	215 W. Mendenhall Bozeman	
Kurtz, Curt MD	8707 Jackrabbit Rd. Belgrade	\$954,000
Three Rivers Clinic	16 Railway Ave. Three Forks	
Allergy and Asthma Consultants PC	1188 N. 15 th Ave. Suite 3 Bozeman	\$724,000

Name	Address	Replacement Value
Belgrade Clinic PLLP	33 W. Main St. Belgrade	\$1,400,000
Belgrade Urgent Care	403 W. Main St. Belgrade	\$340,000
Manhattan Medical Services	207 S. 6 th St. Manhattan	\$79,000
Nature's Wisdom	9202 River Rd. Bozeman	\$104,000
Bridger Mountain Physical Therapy	851 Bridger Dr. Bozeman	
Kreitzburg, Susan	2100 Fairway Dr. Suite 102 Bozeman	\$207,000
Bridger Eye Center and Optical	113 E. Oak St. #2C Bozeman	\$828,000
Rocky Mountain Natural Health	702 N. 19 th Ave. Bozeman	\$737,000
Bozeman Medical Arts Center	300 N. Willson Ave. Bozeman	\$1,474,000
Gallatin Mental Health Center	699 Farmhouse Ln. Bozeman	\$267,000
Gallatin Valley Natural Medicine	2022 N. 22 nd Ave. #2 Bozeman	\$222,000
Family Dermatology Center	2409 W Main St. #1 Bozeman	\$812,000
Alcohol and Drug Services of Gallatin County	2310 N 7 th Ave. Ste. A Bozeman	\$2,019,000
Montana Skin Cancer and Dermatology Center	1727 W College St. Bozeman	\$289,000
Hapcic, Karl MD	1125 W. Kagy Blvd. #201 Bozeman	\$182,000
Bridger Orthopedic	1450 Ellis St. #201 Bozeman	\$700,000
Bridger Orthopedic West	3400 Laramie Dr. Bozeman	
Swingle Health Center	MSU-Bozeman	\$3,681,000
Yellowstone Family Medical	11 S. Electric West Yellowstone	\$500,000
Alpine Physicians Health Center	613 Lamme St. Bozeman	
Bridger Creek Family Health	316 E. Babcock St., Bozeman	

Table 3-5. Critical Facilities - Transportation

Name	Address	Replacement Value
Bozeman-Yellowstone International Airport	850 Gallatin Field Rd. Belgrade	
Yellowstone Airport	625 Yellowstone Airport Rd. West Yellowstone	
Pogreba Field	1680 Airport Rd. Three Forks	
Montana Rail Link	99 Northern Pacific Rd. Belgrade	
Jefferson Lines	1500 N. 7th Bozeman	
Buffalo Bus Lines Inc.	415 Yellowstone West Yellowstone	
Karst Stage	511 N. Wallace Bozeman	
First Student Inc.	3425 N. 27th Ave. Bozeman	
Belgrade School District No. 44, Transportation	17063 Frontage Road Belgrade	
Harlow's Plus Services	1085 Yadon Road Manhattan	
Three Forks Public Schools	210 E. Neal Street Three Forks	
Big Sky School District No. 72	45465 Gallatin Road Big Sky	
West Yellowstone Schools	411 N. Geyser West Yellowstone	

Table 3-6. Critical Facilities - State Government

Name	Address	Replacement Value
Montana Highway Patrol	39 Gold Miner Lane, Suite B Belgrade	
Montana National Guard	350 Airport Rd. Belgrade	
Fish, Wildlife and Parks, Region 3	1400 S. 19 th Ave. Bozeman	
Montana Dept. of Transportation	100 Nelson Road Bozeman	
Montana Department of Natural Resources and Conservation	2273 Boothill Court Bozeman	

Table 3-7. Critical Facilities - Federal Government

Name	Address	Replacement Value
US Forest Service, Custer-Gallatin National Forest Supervisor's Office	10 East Babcock (Federal Building) Bozeman	
US Forest Service, Bozeman Ranger District & Interagency Dispatch Center	3710 Fallon St. (Suite C) Bozeman	
US Forest Service, Hebgen Lake Ranger District	330 Gallatin Rd. West Yellowstone	
USFS West Yellowstone Interagency Fire Center Smokejumper Base	670 Air Center Rd. West Yellowstone	
US Forest Service, Shenango Helibase	Gallatin Canyon (N 45.4560° N, 111.2432° W)	
Federal Building (GSA) & US Post Office	32 East Babcock Bozeman	
National Park Service West Yellowstone Visitors Center	30 Yellowstone Ave. West Yellowstone	
National Park Service Yellowstone Nat'l Park – W. Entrance	Highway 191 Yellowstone National Park	
US Post Office	5711 E. Baxter Lane Bozeman	
US Post Office	9 Front St. Three Forks	
US Post Office	96 N. Weaver Belgrade	
US Post Office	201 E. Railroad Manhattan	
US Post Office	4 Rabel lane Gallatin Gateway	
US Post Office	209 Grizzly Ave. West Yellowstone	

Table 3-8. Critical Facilities - Assisted Living and Senior Housing

Name	Address	Replacement Value
Evergreen Healthcare	321 N. 5 th St. Bozeman	\$1,628,000
Bear Creek Respite Care	1002 E. Kagy Bozeman	\$139,000
Bozeman Health Hillcrest Senior Living	1201 Highland Blvd. Bozeman	\$13,777,000
Bozeman Adult Day Center	807 N. Tracy Bozeman	\$1,000,000
Highgate Senior Living	2219 W. Oak Bozeman	\$4,892,000
Spring Meadows	3175 Graf St. Bozeman	
Generations Assisted Living	700 Minnesota Belgrade	\$201,000
Open Arms Elderly Care	505 Minnesota Bozeman	\$250,000

Name	Address	Replacement Value
Our Home Elderly Care	190 Milestone Dr. Bozeman	
Century Village	100 Hamilton Ct. Manhattan	
Pathways Personal Care Home	622 Main Three Forks	\$124,000
Edgewood Vista Adult Day Care	1011 Cardinal Dr. Belgrade	\$578,000
Dutch Hearth	991 Pache Rd. Belgrade	\$146,000
Church Hill Retirement Home	6151 Shady Rest Church Hill	\$1,500,000
Mercy Manor	5830 Sypes Canyon Rd. Bozeman	\$234,000
Gallatin Rest Home	1221 W. Durston Bozeman	
Mountain View Care Center	205 N. Tracy Bozeman	\$1,939,000
Aspen Pointe at Hillcrest	1201 Highland Blvd. Bozeman	
High Country Care	8659 Haggerty Ln. Bozeman	\$169,000
Hyalite Country Care	6040 S. 3 rd Rd. Bozeman	
Hamilton House	9430 Haggerty Ln. Bozeman	\$132,000
Darlington Manor	606 N. 5 th Ave. Bozeman	
Legion Villa	1215 W. Durston Bozeman	

Table 3-9. Critical Facilities - Schools

Name	Address	Replacement Value
Manhattan Elementary	416 N. Broadway Manhattan	
Manhattan High School	416 N. Broadway Manhattan	
Chief Joseph Middle School	309 N. 11 th Bozeman	\$17,000,000
Meadowlark School	4415 Durston Rd. Bozeman	

Name	Address	Replacement Value
Emily Dickinson School	2435 Annie St. Bozeman	\$7,000,000
Hawthorne School	114 N. Rouse Bozeman	\$5,000,000
Hyalite School	3600 W. Babcock Bozeman	
Irving School	611 S. 8 th Bozeman	
Longfellow School	516 S. Tracy Bozeman	
Morning Star School	830 Arnold Bozeman	
Sacajawea Middle School	3535 S. 3 rd Bozeman	\$12,000,000
Whittier School	511 N. 5 th Bozeman	\$5,000,000
Bozeman High School	205 N. 11 th Bozeman	\$44,000,000
Gallatin High School (under construction - to open in 2020)	Flanders Mill Rd. & Oak St. Bozeman	\$100,000,000
Willow Creek High School	407 Main St. Willow Creek	\$2,500,000
Springhill School	602 Springhill Community Rd. Belgrade	\$121,000
Cottonwood School	13233 Cottonwood School Bozeman	
Three Forks Elementary	212 E. Neal Three Forks	
Three Forks High School	210 E. Neal Three Forks	\$12,000,000
Pass Creek School	3747 Pass Creek Rd. Belgrade	
Monforton School	6001 Monforton School Rd. Bozeman	
Gallatin Gateway School	100 Mill St. Gallatin Gateway	
Anderson School	10040 Cottonwood Rd. Bozeman	\$23,000
LaMotte School	841 Bear Canyon Rd. Bozeman	

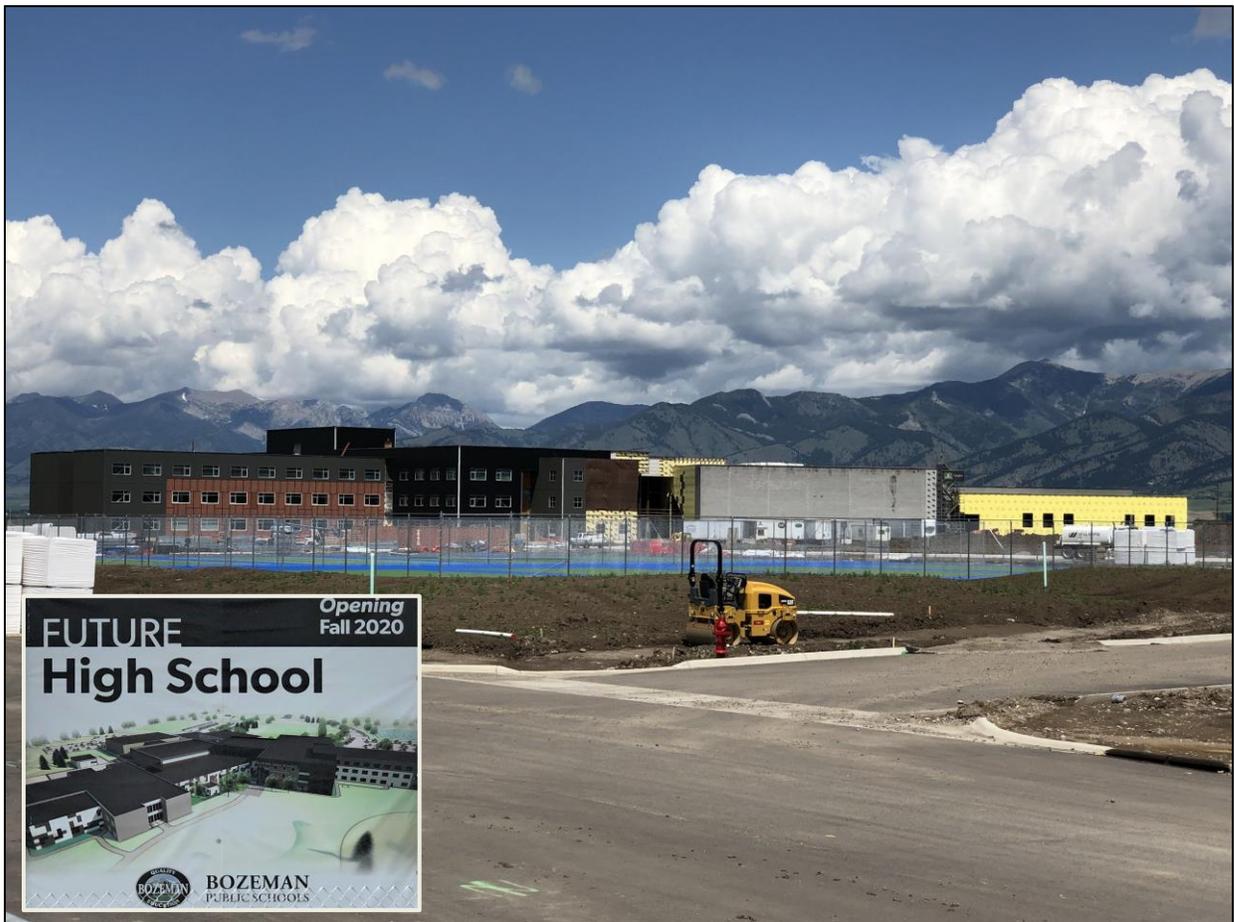
Name	Address	Replacement Value
Martha Fox Heck School	308 N. Broadway Belgrade	\$3,000,000
Quaw Elementary	91 Southview Ave. Belgrade	\$4,000,000
Ridge View Elementary	117 Green Belt Dr. Belgrade	\$3,500,000
Belgrade Middle School	400 Triple Crown Rd. Belgrade	\$3,000,000
Belgrade High School	303 N. Hoffman Belgrade	\$20,000,000
Malmborg School	375 Jackson Creek Rd. Bozeman	
West Yellowstone Elementary	500 Delacy West Yellowstone	\$4,500,000
West Yellowstone High School	500 Delacy West Yellowstone	
Ophir School	45465 Gallatin Rd. Big Sky	
Lone Peak High School	45465 Gallatin Rd. Big Sky	
Amsterdam School	6360 Camp Creek Rd. Manhattan	\$700,000
Mount Ellis Academy	3641 Bozeman Trail Rd. Bozeman	
Manhattan Christian	8000 Churchill Rd. Manhattan	
Headwaters Academy	418 W. Garfield Bozeman	
Heritage Christian	4310 Durston Bozeman	
Gallatin-Madison Cooperative	21000 Frontage Rd. Belgrade	
Bozeman Christian School	1935 Nelson Rd. Bozeman	\$180,000
Great Beginnings Montessori	5860 Springhill Rd. Bozeman	
Sourdough Montessori School	4310 Sourdough Rd. Bozeman	\$127,000
Cottonwood Day School	10180 Cottonwood Rd. Bozeman	

Name	Address	Replacement Value
Greenwood Academy	2015 Wheat Dr. Bozeman	
Learning Circle Montessori	516 W. Cleveland	
Summit School	3001 W. Villard Bozeman	\$450,000
Bridger Alternative School	205 N. 11 th Bozeman	
Highland Montessori	111 Highland Blvd. Bozeman	
World Family School	115 E. Dickerson Bozeman	
Petra Academy	4720 Classical Way Bozeman	
Bozeman Montessori	3774 Equestrian Lane Bozeman	
Middle Creek Montessori	1572 Cobb Hill Rd. Bozeman	
Renaissance Montessori	428 N. 11 th Ave. Bozeman	
Secret Garden Montessori	900 Cobb Hill Rd. Bozeman	
Yellowstone Montessori	1705 W. Kagy Blvd. Bozeman	

Table 3-10. Critical Facilities - Child Care, Day Care and Preschools

Name	Address	Replacement Value
Ark Child Care Center	403 W. Central Belgrade	
Little Lambs Child Development Center	308 Al Drive Belgrade	
Building Blocks Academy	301 S. 19 th Bozeman	
Children's Development Center	804 S. Willson Bozeman	
Montessori Children's House	1450 W. Kagy Bozeman	
Great Beginnings Montessori	5860 Springhill Rd. Bozeman	
Greenwood Academy	2015 Wheat Dr. Bozeman	
Head Start	32 S. Tracy Bozeman	
Highland Montessori	111 Highland Blvd. Bozeman	
Learning Circle	516 W. Cleveland Bozeman	

Name	Address	Replacement Value
Little People's Academy	1612 W. Babcock Bozeman	
Methodist Preschool	121 S. Willson Bozeman	
Heritage Christian Preschool	4310 Durston Rd. Bozeman	
Montana Kids	1105 Campbell Rd. Bozeman	
MSU Child Development Center	Herrick Hall Bozeman	
Pilgrim Preschool	2118 S. 3 rd Bozeman	
Sourdough Montessori	4310 Sourdough Rd. Bozeman	
Southwood Child Care	1805 S. Tracy Bozeman	
Sunshine Day Care	1805 S. Tracy Bozeman	
Teddy Bear Express	411 Arnold Bozeman	
Almost Home Child Care	1440 Bobcat Dr. Bozeman	
Little Geysers Child Care	603 Yellowstone Ave. West Yellowstone	

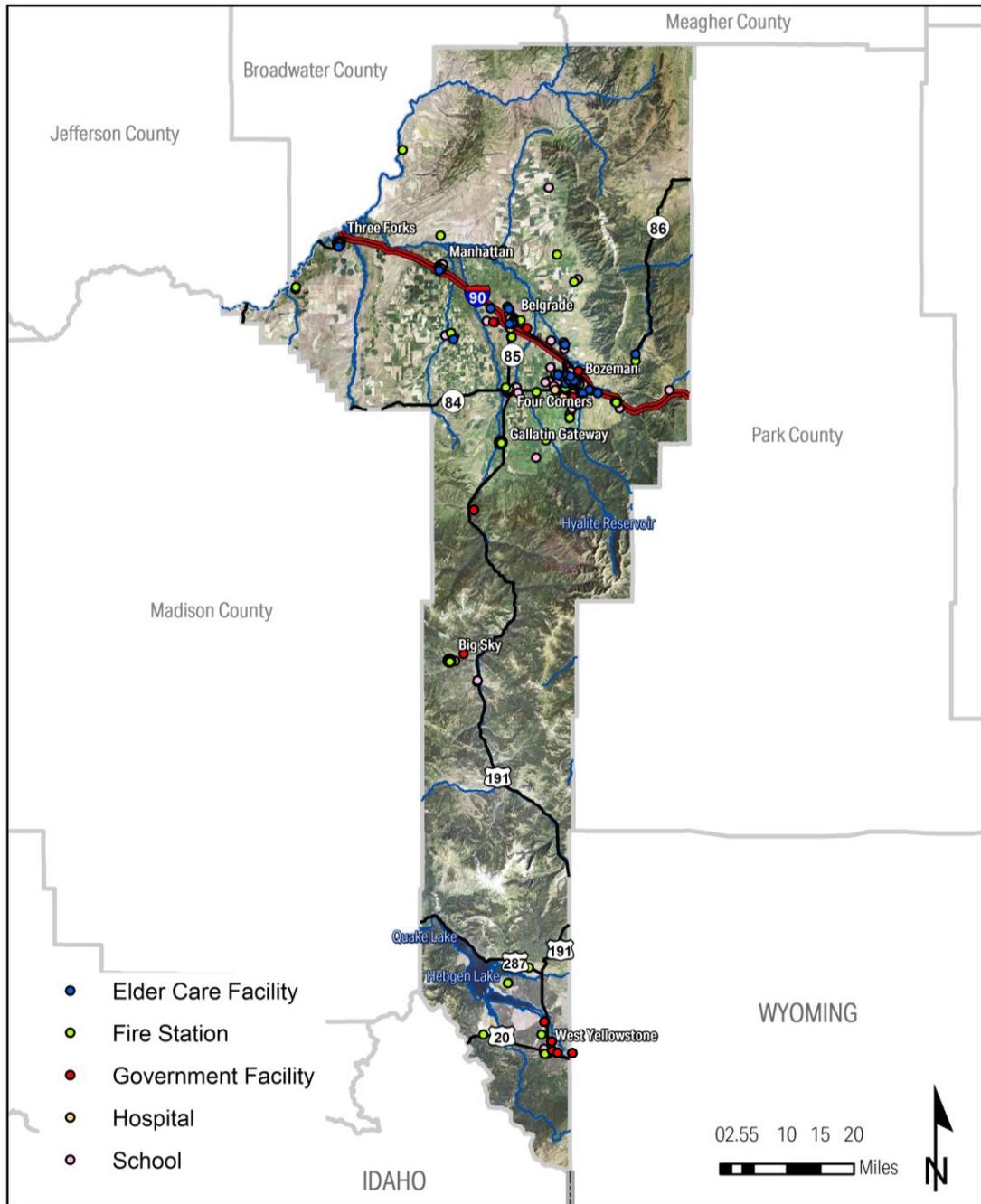


New Gallatin High School (Bozeman) under construction, June 2019.

Photo courtesy M. Rotar

Critical Facilities

Gallatin County, Montana

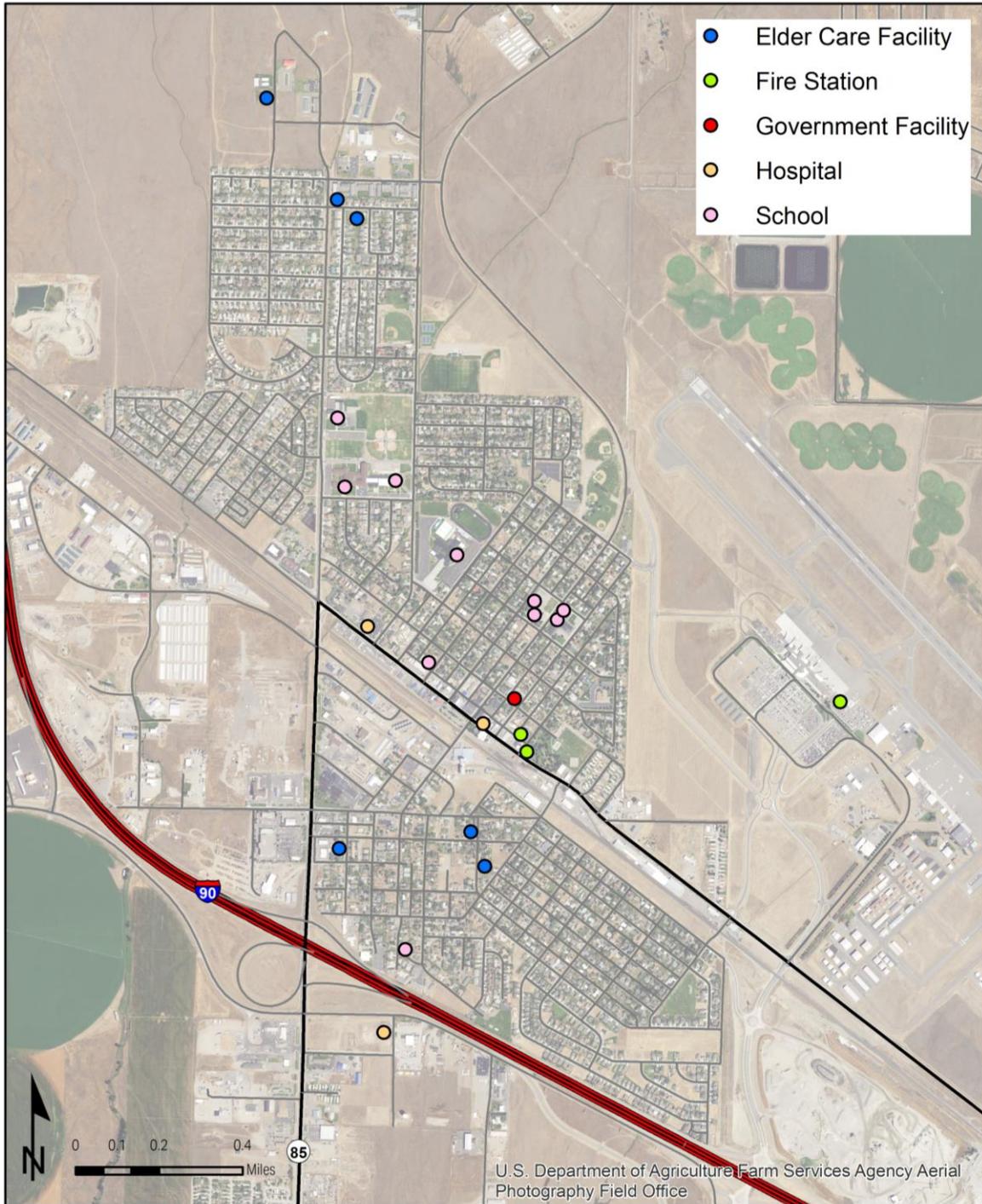


Data Source: Montana NRIS, Gallatin County GIS
 Data Date: August 2017
 Mapp Coordinates: NAD 1983, State Plane Montana

Figure 3-1. Critical Facilities Overview

Critical Facilities

Belgrade, Montana

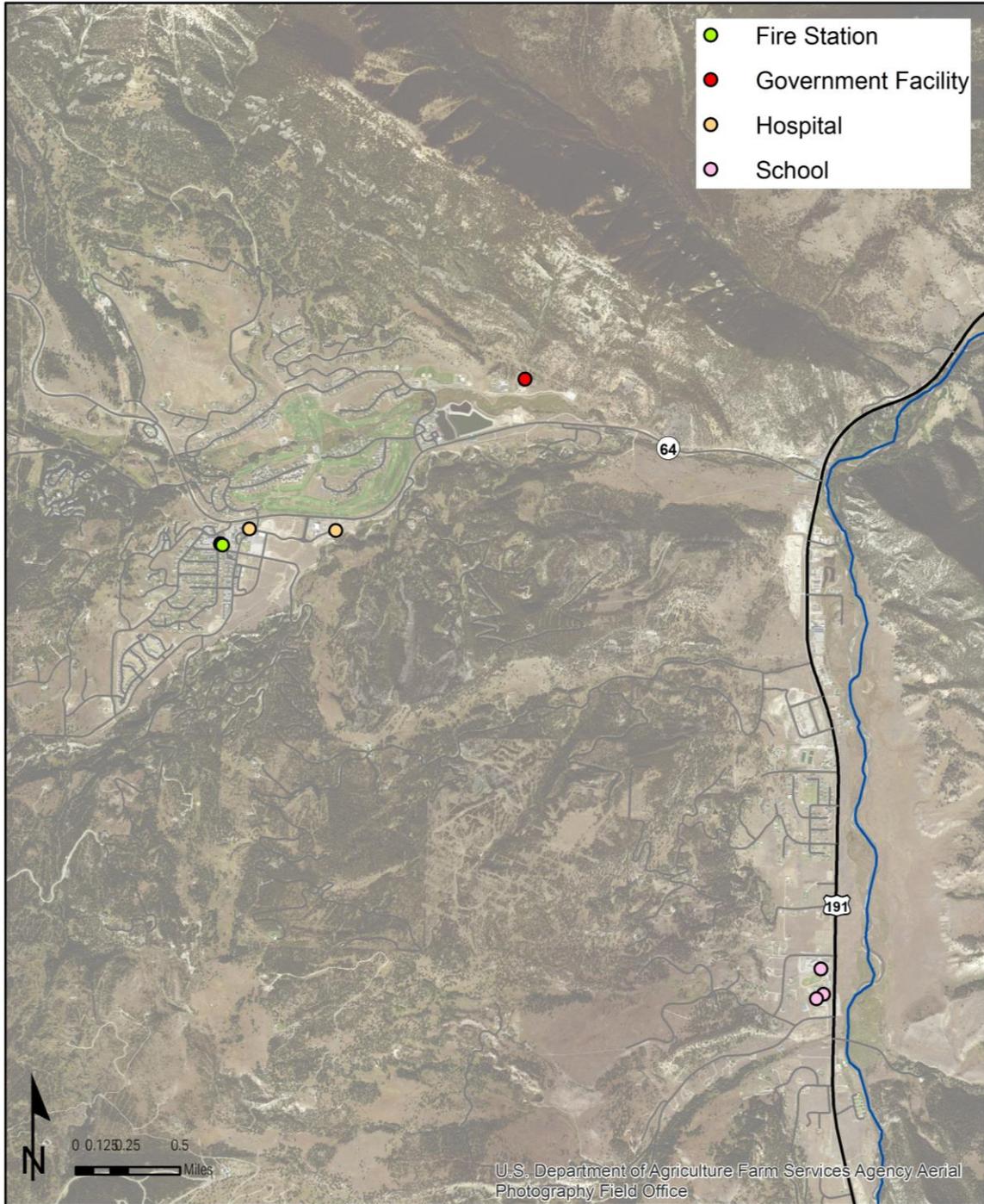


Data Source: Montana NRIS, Gallatin County GIS
Base: NAIP 2015
Data Date: August 2017
Map Coordinates: NAD 1983, State Plane Montana

Figure 3-2. Belgrade Critical Facilities

Critical Facilities

Big Sky, Montana

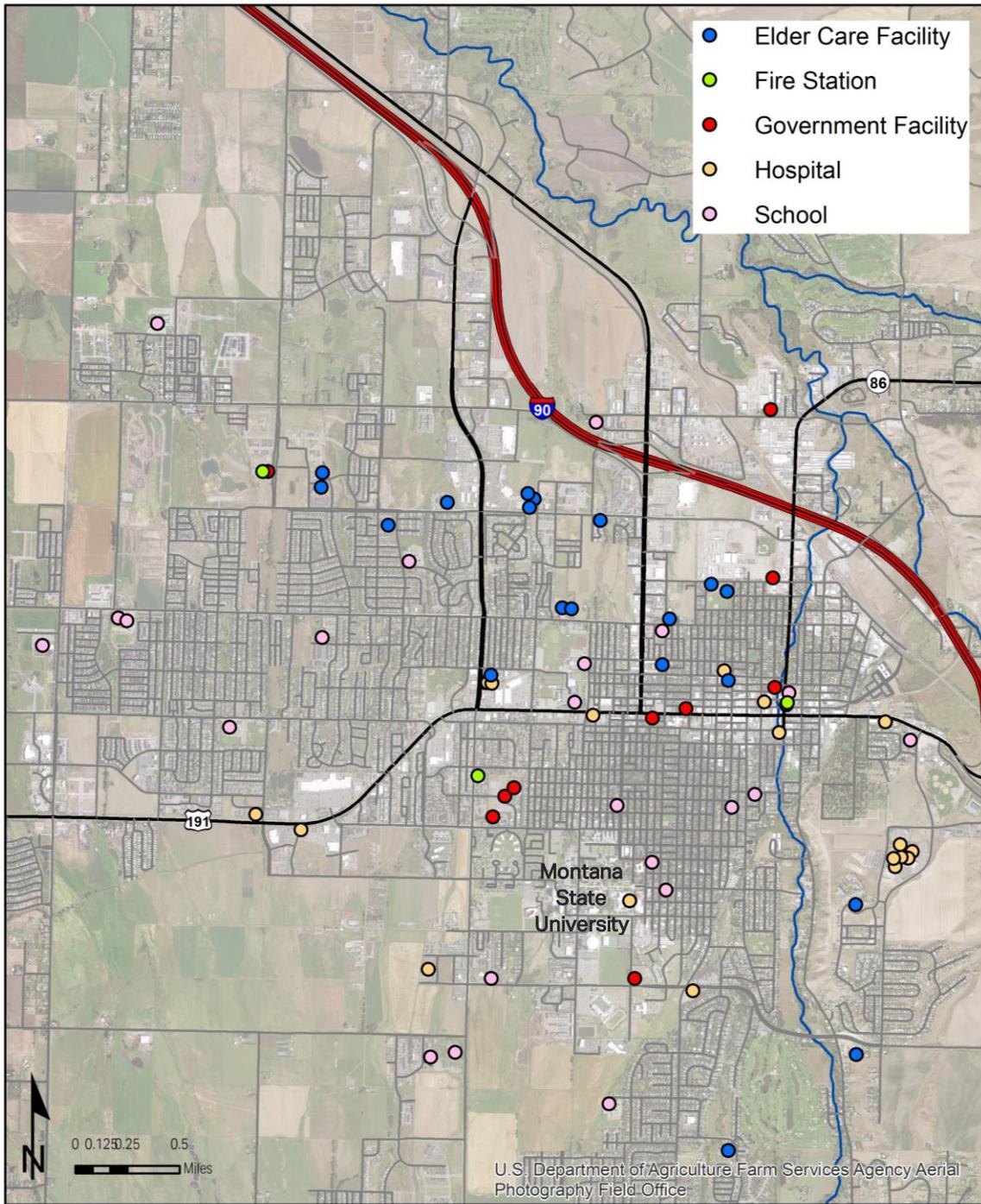


Data Source: Montana NRIS, Gallatin County GIS
Base: NAIP 2015
Data Date: August 2017
Map Coordinates: NAD 1983, State Plane Montana

Figure 3-3. Big Sky Critical Facilities

Critical Facilities

Bozeman, Montana

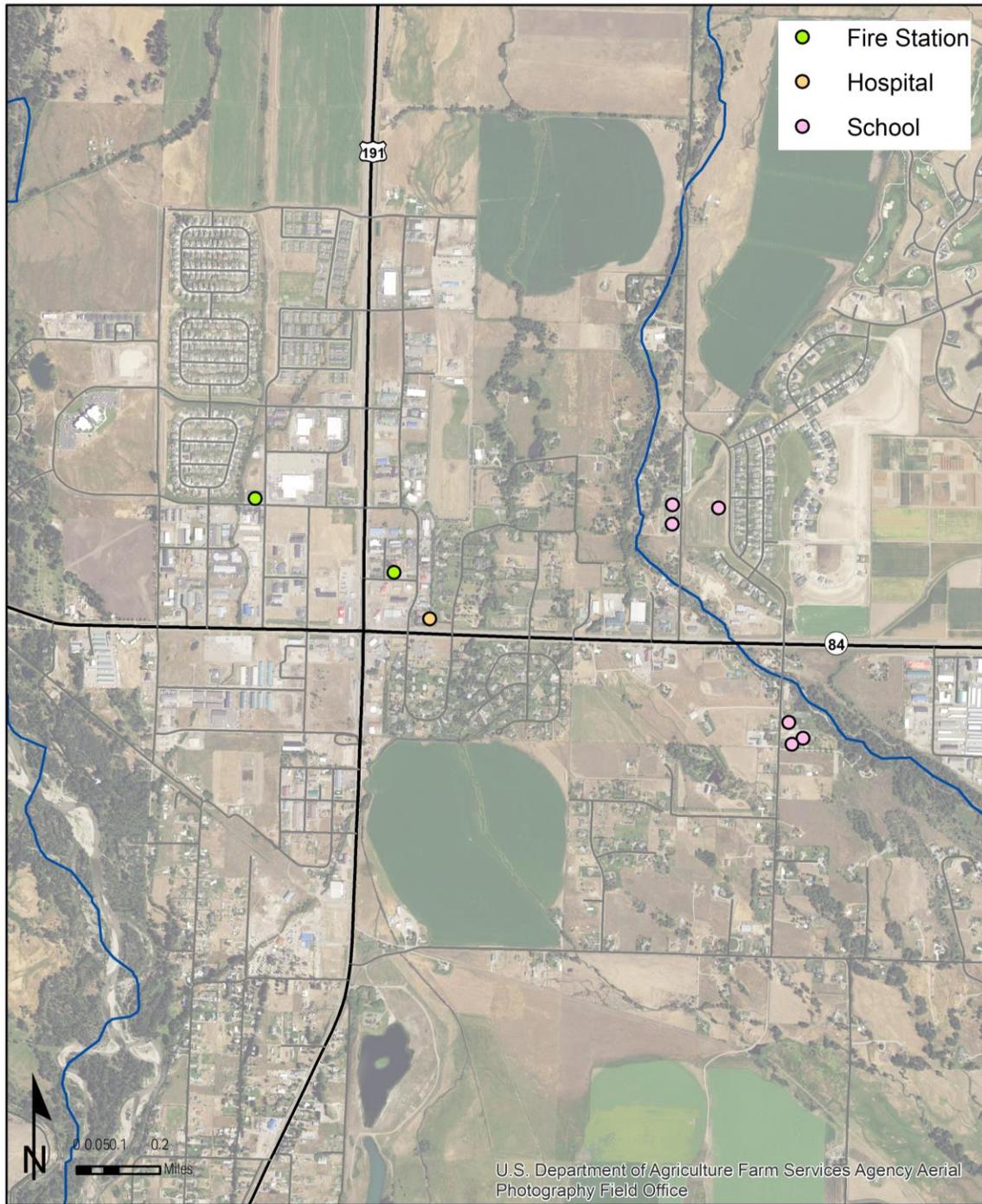


Data Source: Montana NRIS, Gallatin County GIS
Base: NAIP 2015
Data Date: August 2017
Map Coordinates: NAD 1983, State Plane Montana

Figure 3-4. Bozeman Critical Facilities

Critical Facilities

Four Corners, Montana



Data Source: Montana NRIS, Gallatin County GIS
Base: NAIP 2015
Data Date: August 2017
Map Coordinates: NAD 1983, State Plane Montana

Figure 3-5. Four Corners Critical Facilities

Critical Facilities

Manhattan, Montana



Data Source: Montana NRIS, Gallatin County GIS
Base: NAIP 2015
Data Date: August 2017
Map Coordinates: NAD 1983, State Plane Montana

Figure 3-6. Manhattan Critical Facilities

Critical Facilities

Three Forks, Montana

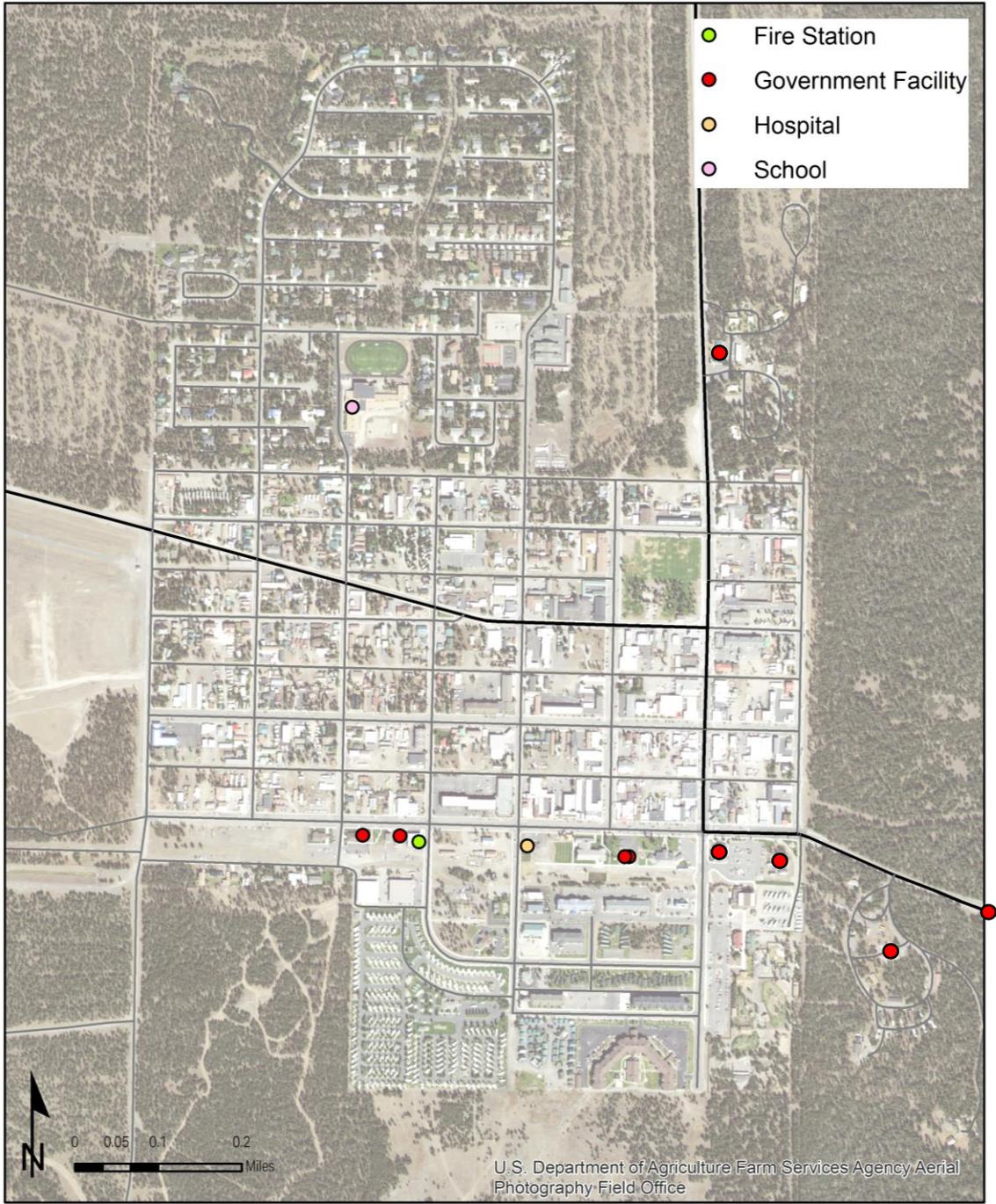


Data Source: Montana NRIS, Gallatin County GIS
Base: NAIP 2015
Data Date: August 2017
Map Coordinates: NAD 1983, State Plane Montana

Figure 3-7. Three Forks Critical Facilities

Critical Facilities

West Yellowstone, Montana



Data Source: Montana NRIS, Gallatin County GIS
Base: NAIP 2015
Data Date: August 2017
Mapp Coordinates: NAD 1983, State Plane Montana

Figure 3-8. West Yellowstone Critical Facilities

3.2.1.2 CRITICAL INFRASTRUCTURE

Critical facilities were initially identified throughout the planning process for the 2006 and 2012 plans and then reviewed and updated in 2018. A list of critical infrastructure in Gallatin County is included in **Table 3-11**, with more detail provided in the sections below.

Table 3-11. Critical Facilities - Utility and Infrastructure Services

Name	Address	Replacement Value
Northwestern Energy (local office)	121 E. Griffin Dr. Bozeman	
Northwestern Energy (substation)	City of Bozeman Water Reclamation Facility	
Northwestern Energy (substation)	Bohart Ln. – Bozeman	
Northwestern Energy (substation)	Quinn Creek Rd. – Bozeman Pass	
Northwestern Energy (substation)	South Church Rd. - Bozeman	
Northwestern Energy (substation)	College & 11 th Ave. – Bozeman	
Northwestern Energy (substation)	Patterson Road - Bozeman	
Northwestern Energy (substation)	Flanders Mill Rd. – Bozeman	
Northwestern Energy (substation)	Four Corners	
Northwestern Energy (substation)	Belgrade	
Northwestern Energy (substation)	Three Forks	
Northwestern Energy (substation)	Trident	
Northwestern Energy (substation)	Big Sky	
Northwestern Energy Natural Gas Transmission Line	(refer to Figure 3-9)	
Fall River Rural Electric (substation)	West Yellowstone	
Fall River Rural Electric (substation)	1.3 miles west of W. Yellowstone	
Fall River Rural Electric (substation)	Romsett	
Fall River Rural Electric (substation)	North side of Hebgen Lake	
ExxonMobil Bozeman Terminal	220 W. Griffin Drive Bozeman	
Phillips66 Bozeman Products Terminal	318 W. Griffin Drive Bozeman	
CHS (Cenex) Logan Petroleum Terminal	Logan	
Yellowstone Pipeline Company	(refer to Figure 3-9)	

Name	Address	Replacement Value
Energy West - Montana (West Yellowstone natural gas system)	145 N. Geysler St. West Yellowstone	
Century Link	2707 W. Main St. Bozeman	
3 Rivers Communications	12 Skywood Rd. Big Sky	
Gallatin County Landfill	10585 2 Dog Rd. Logan	
Bozeman Vehicle Maintenance	1812 N. Rouse Bozeman	\$1,400,000
Gallatin County Road Department	205 W. Baxter Lane Four Corners	
Bozeman Water Reclamation Facility	2245 Springhill Rd. Bozeman	
Bozeman Water Treatment Plant	7022 Sourdough Canyon Rd. Bozeman	
Bozeman Lyman Water Treatment	Story Mill Rd. Bozeman	
Bozeman Hilltop Water Tank and Communications Site	Kenyon Dr. Bozeman	
Bozeman Sourdough Road Reservoir (buried concrete tank)	Sourdough Rd. Bozeman	
Riverside Water & Sewer Dist. No. 310 (north of Bozeman/Riverside CC area)	Bozeman	
RAE Water & Sewer District (west of Bozeman)	10 Rae Water Ln. Bozeman	
Four Corners Water & Sewer District No. 385 (Four Corners area)	495 Quail Run Rd. Bozeman	
Gallatin Gateway County Water & Sewer District	Gallatin Gateway	
Valley Grove Water & Sewer District No. 373 (northwest of Bozeman)	299 Willow Blvd. Bozeman	
Belgrade Public Works	91 E. Central Ave. Belgrade	
River Rock County Water & Sewer District No. 377 (west of Belgrade)	265 N. River Rock Belgrade	
Manhattan Public Works	107 S. 7 th St. Manhattan	
Amsterdam/Churchill County Sewer District No. 307	7200 Churchill Rd. Manhattan	
Three Forks City Shop	306 Railway Ave. Three Forks	\$5,000,000
Willow Creek Sewer District No. 306	Willow Creek	
Big Sky County Water & Sewer District No. 363	561 Little Coyote Rd. Big Sky	
West Yellowstone Public Works	314 Yellowstone Ave. West Yellowstone	\$350,000
Hebgen Lake Estates County Water & Sewer District (Horse Butte area)	West Yellowstone	
Yellowstone Holiday Water & Sewer District No. 348 (N side of Hebgen Lake)	West Yellowstone	

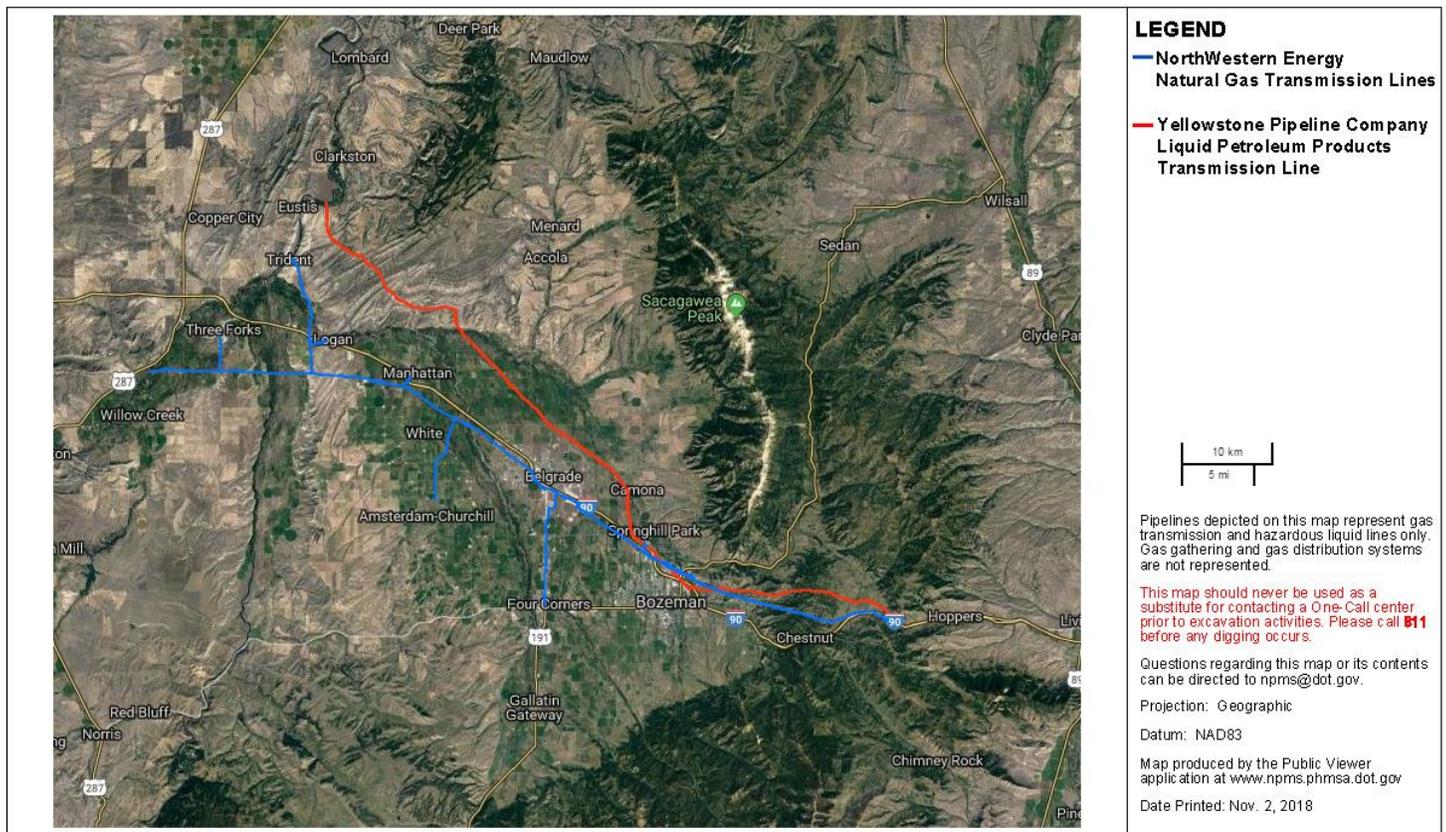


Figure 3-9. Major Natural Gas and Petroleum Pipeline Routes (from N2ational Pipeline Mapping System, www.npms.phmsa.dot.gov)

Electricity

Electricity provides power for lights, computers, medical equipment, water pumps, electric heating systems, refrigerators, freezers, televisions, and many other types of equipment. Northwestern Energy, headquartered in Sioux Falls, South Dakota, provides electricity to a large portion of Gallatin County. Fall River Rural Electric Cooperative provides electric service to the southern portion of Gallatin County, in the Hebgen Lake and West Yellowstone areas. Much of the electric service is run through overhead lines. These lines are supported by poles and have key components such as transformers and substations.

Natural Gas

During the cold winter months, the heating of homes and businesses is a necessity. The primary heating fuel used in Gallatin County is natural gas, with liquid propane (LP) gas also widely used in rural areas of the county. Overall, several types of fuels are used for heating purposes as shown in **Table 3-12**. Most systems ultimately require electricity to run their thermostats and blowers. Natural gas in portions of Gallatin County is provided by NorthWestern Energy through underground pipeline infrastructure (see **Figure 3-9**). Energy West provides natural gas service in West Yellowstone. Buildings heated with propane typically have a nearby tank that is refilled regularly by a local vendor. The vendor uses a truck to transport the propane to the users. Therefore, the vendors rely on accessibility to the communities and rural residents via the road network. Should any areas become isolated due to poor road conditions, the vendor may not be able to access the tanks to refill them.

Table 3-12. Home Heating Fuel [US Census, 2013-2017 American Community Survey (ACS), 2018b]

	Natural Gas	Bottled, Tank, or LP Gas	Electricity	Coal or Coke	Wood	Solar Energy	Other Fuel	No Fuel Used
Gallatin County (Total)	23,520	2,847	11,197	0	2,399	55	403	170
Big Sky Community	111	232	471	0	187	15	13	0
City of Belgrade	1,755	45	940	0	208	0	78	0
City of Bozeman	11,023	193	6,324	0	326	10	106	113
Gallatin Gateway Community	118	49	120	0	75	0	3	0
Town of Manhattan	449	4	74	0	58	0	7	0
City of Three Forks	624	4	127	0	77	0	0	0
Town of West Yellowstone	162	72	333	0	35	0	0	0

Telephone

Local telephone services in the county are provided by Century Link (Gallatin Valley and West Yellowstone), and 3 Rivers Communications (Big Sky area). Similar to electric infrastructure, telephone can be run through overhead or underground lines. Much of the telephone infrastructure in Gallatin County lies within the road rights-of-way.

Water and Sewer

Municipal water and sewer systems exist within the incorporated communities in the county. Several unincorporated communities, such as Big Sky, Four Corners and Gallatin Gateway, as well as a few residential subdivisions, have local water or sewer districts (or both). The water systems typically consist of groundwater wells or pumps from a body of water. The sewer systems generally have treatment plants and/or lagoons. Both water and sewer use underground pipes to service customers. County residents living outside of municipal systems or local water and sewer districts rely on individual well and septic systems.

Transportation

Transportation infrastructure within Gallatin County includes road, rail, and air networks. The primary road transportation routes in Gallatin County are: Interstate 90; US Highways 20, 191, and 287; and Montana Highways 2, 64, 84, 85, and 86. Gallatin County has an estimated 1,250 miles of county roads.

Montana Rail Link operates two railroad lines through the county. A main line runs through the northern section of Gallatin County and connects to Bozeman, Belgrade, Manhattan, and Logan. A second railroad branches from the main line at Logan and runs through Three Forks before connecting to various jurisdictions in Madison County. The railroad transports goods and raw materials along both lines.

Bozeman-Yellowstone International Airport (BZN), located in Belgrade, operates within Gallatin County. It is the busiest airport in the State of Montana, and a full-service commercial airport with both domestic and international flights. Additionally, Gallatin County has two smaller airports - West Yellowstone Airport (WYS) which has seasonal commercial traffic as well as private aircraft. WYS also houses the West Yellowstone Interagency Fire Center which is operated by the U.S. Forest Service. Pogreba Field (9S5), located in Three Forks, is a general aviation facility serving private, charter, and/or government aircraft.

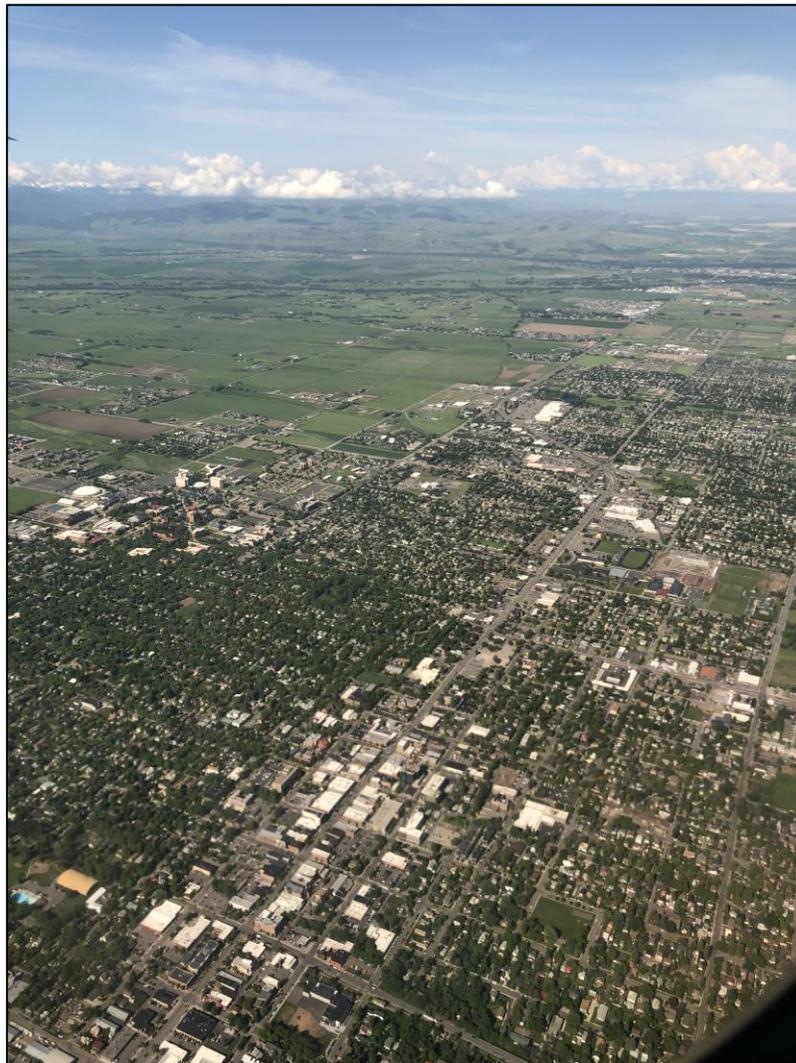
3.3 POPULATION AND STRUCTURES

Citizens, visitors, and their property are all at risk from various disasters. Protection of life is the top priority in all disasters and incidents. Population statistics are listed below in **Table 3-13**.

Table 3-13. Population Statistics [U.S. Census Bureau, 2018a]

Location	July 1, 2018 Estimated Population	Change Since 2010 Census
Gallatin County	111,876	25.0%
Big Sky	2,904 ¹	25.8%
Belgrade	8,993	21.7%
Bozeman	48,532	30.2%
Four Corners	4,051 ¹	28.8%
Gallatin Gateway	892 ¹	4.2%
Manhattan	1,822	19.9%
West Yellowstone	1,382	8.7%
Three Forks	2,053	9.8%

¹ Sourced from US Census, American Community Survey (ACS) data for census-designated place (CDP), 2013-2017, 5-year estimate



Aerial view of downtown Bozeman and Montana State University, May 2019.
Photo courtesy M. Rotar.

Like critical facilities, structures such as residences are also vulnerable to hazards. Error! Not a valid bookmark self-reference. and **Table 3-15** detail selected Gallatin County housing statistics.

Table 3-14. Housing Statistics [US Census, 2013-2017 American Community Survey (ACS), 2018b]

	Number of Housing Units	Number of Mobile Homes	Number of Occupied Housing Units Lacking Complete Plumbing Facilities	Number of Occupied Housing Units Lacking Complete Kitchen Facilities	Number of Occupied Housing Units Lacking Telephone Service
Gallatin County (Total)	51,011 ¹	3,698	144	251	943
Big Sky Community	3,651	21	0	0	6
City of Belgrade	3,238	236	0	0	33
City of Bozeman	19,972	678	10	99	359
Gallatin Gateway Community	426	121	11	11	0
Town of Manhattan	653	67	0	10	3
City of Three Forks	892 ²	113 ²	0	0	3
Town of West Yellowstone	910	76	9	21	77

¹ Sourced from US Census, Quick Facts, Gallatin County, Montana, 2018 estimates.

² Data provided by City of Three Forks.

Table 3-15. Structure Age [US Census, 2013-2017 American Community Survey (ACS), 2018b]

	Total Housing Units	2014 or later	2010 to 2013	2000 to 2009	1990 to 1999	1980 to 1989	1970 to 1979	1960 to 1969	1950 to 1959	1940 to 1949	1939 or earlier
Gallatin County (Total)	51,011 ¹	3,906	2,271	12,994	9,006	5,407	6,921	2,680	1,849	819	3,591
Big Sky Community	3,651	20	27	1,638	774	443	587	27	51	33	51
City of Belgrade	3,238	20	0	926	881	351	634	137	127	63	99
City of Bozeman	19,972	404	1,435	5,791	2,936	1,968	2,606	1,394	1,071	386	1,981
Gallatin Gateway Comm.	426	12	32	87	67	55	117	3	5	0	48
Town of Manhattan	653	0	0	40	141	72	115	29	56	43	157
City of Three Forks	892 ²	10	3	160	144	99	110	71	17	28	242
Town of West Yellowstone	910	56	37	161	98	207	89	80	58	75	49

¹ Sourced from US Census, Quick Facts, Gallatin County, Montana, 2018 estimates.

² Data provided by City of Three Forks.

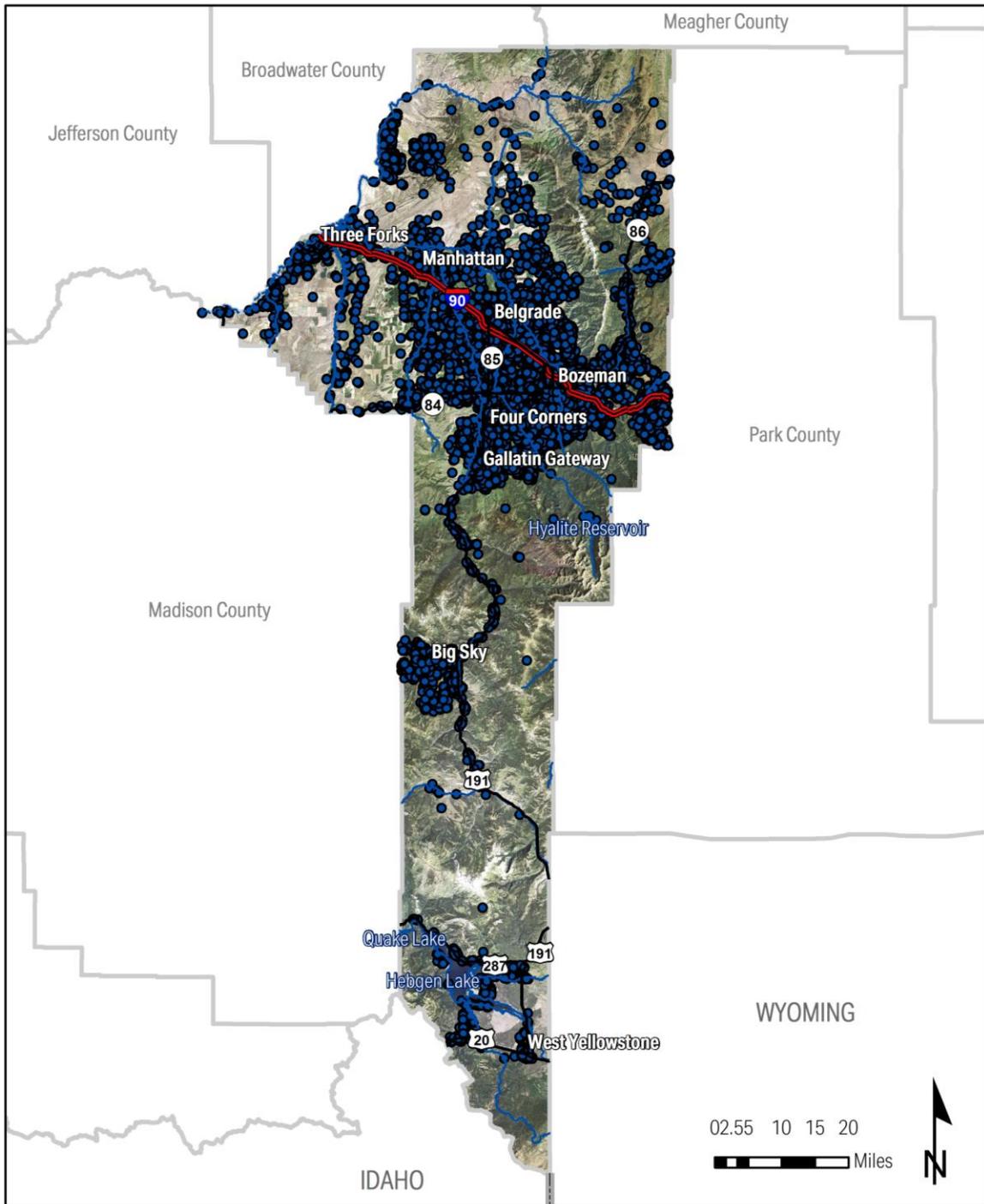
The median home value in Gallatin County is \$303,700 according to 2017 U.S. Census estimates, and \$362,278 (thru September 2017) according to the Gallatin Association of Realtors. The cost to replace existing structures is listed below in **Table 3-16** using both U.S. Census and Montana Dept. of Revenue, Computer-Assisted Mass Appraisal (CAMA) data, as well as FEMA's HAZUS-MH loss estimation software. **Figure 3-10** shows the locations of structures with values based on the closest CAMA parcel with a building value greater than \$0.

Table 3-16. Structure Value [US Census, 2013-2017 American Community Survey (ACS), 2018b]

	Census Estimated Median Value	CAMA Estimated Average Value	HAZUS-MH Residential Building Total Replacement Value
Gallatin County	\$303,700	\$345,920	\$7,641,663,000
Big Sky Community	\$397,900	\$660,260	\$340,755,000
City of Belgrade	\$209,700	\$278,120	\$428,268,000
City of Bozeman	\$310,800	\$454,730	\$2,926,557,000
Gallatin Gateway Community	\$343,900	\$466,250	\$95,429,000
Town of Manhattan	\$224,800	\$280,760	\$135,709,000
City of Three Forks	\$186,000	\$125,670	\$112,546,000
Town of West Yellowstone	\$243,200	\$397,300	\$181,602,000

Structure Locations

Gallatin County, Montana



Data Source: Montana NRIS
Data Date: August 2017
Map Coordinates: NAD 1983, State Plane Montana

Figure 3-10. Structure Locations

3.4 ECONOMIC, ECOLOGIC, HISTORIC, AND SOCIAL VALUES

Gallatin County is characterized by its abundance of natural resources and beauty, in addition to its strong economic development and growth within recent years.

Disasters of any magnitude can threaten the fragile economies and well-being of residents. Basic economic statistics collected from U.S. Census data include:

/ Median household income [US Census, 2013-2017 ACS, 2018b]:	\$59,397
/ Persons below poverty [US Census, 2013-2017 ACS, 2018b]:	13.0%
/ Percent unemployed [US Census, 2013-2017 ACS, 2018b]:	4.3%

The largest private employment sectors in the county according to U.S. Census data include (by number of persons employed) [US Census, 2013-2017 ACS, 2018b]:

/ Accommodation & food services, entertainment, and recreation:	7,359
/ Retail trade:	7,113
/ Professional, scientific, and technical services:	6,390
/ Construction:	5,854
/ Health care and social assistance:	5,822

Based on data from the USDA Census of Agriculture in 2012, the following agricultural statistics were determined [USDA, National Agricultural Statistics Service, 2012]:

/ Number of farms:	1,163
/ Acres of farmland:	702,713 acres
/ Total market value of agricultural products sold:	\$105,970,000
» Livestock and poultry sales:	\$47,168,000
» Crop sales:	\$58,802,000
/ Number of cattle and calves:	50,089
/ Number of sheep and lambs:	18,098

Historic values represent a point in time. Historic values can include sites, buildings, documents, and other pieces that preserve times past and have value to people. Gallatin County has 106 properties and districts listed on the National Register of Historic Places [National Park Service (NPS), 2018], including the National Historic Landmark at Three Forks of the Missouri, designated in 1960 to recognize where the Lewis & Clark Expedition camped in 1805.

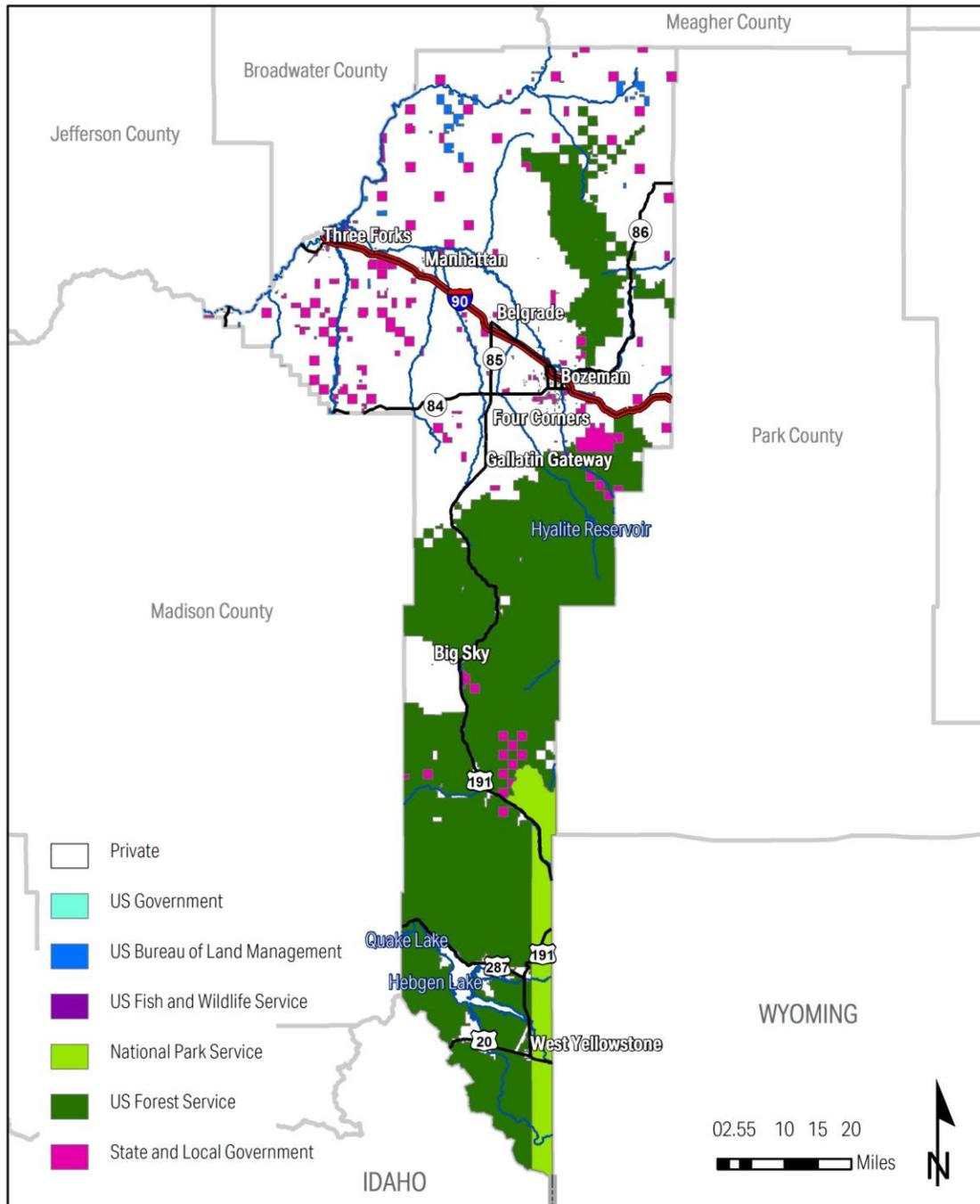
Social values often cannot be quantified but are an important aspect of quality of life and interpersonal relationships. Examples of social values in Gallatin County may include gatherings to promote community building, personal achievement, freedom from tyranny, the ability to communicate with others, pride in making the world a better place, and friendships. The realm of social values is only limited by the human imagination and usually relates to how a person feels. Disasters, both natural and human-caused, can disrupt important social activities and sometimes have lasting effects on society.

3.5 CURRENT LAND USE

Gallatin County has varied land use, with nearly half of land under public ownership by the USDA Forest Service, State of Montana, Bureau of Land Management or the National Park Service. Both urban and rural communities are present, with individual residences and farms interspersed. Growth is occurring throughout the county. **Figure 3-11** shows federal, state, and local government ownership in the county.

Land Ownership

Gallatin County, Montana



Data Source: Montana NRIS
 Data Date: August 2017
 Mapp Coordinates: NAD 1983, State Plane Montana

Figure 3-11. Gallatin County Land Ownership

3.6 NEW AND FUTURE DEVELOPMENT

According to U.S. Census data, Gallatin County experienced a 32 percent increase in population between 2000 and 2010; from 2010 to 2017, the population of the county was estimated to have increased by 20.4 percent [U.S. Census Bureau, 2018a]. The rapid increase in population has been associated with an increase in development. Often, smart development is an inexpensive and effective way to reduce the impact of future disasters on the community. The following mechanisms are used by the jurisdictions to guide future development.

3.6.1 GROWTH POLICIES

Gallatin County and the incorporated jurisdictions all have growth policies, as required by state law. The growth policies do not have regulatory authority but guide community development regulations and ultimately replace comprehensive plans. The [Gallatin County Growth Policy](#) applies to the parts of Gallatin County that are not within the jurisdictions of the City of Bozeman, City of Belgrade, City of Three Forks, Town of Manhattan, or Town of West Yellowstone.

- [Gallatin County Growth Policy, April 15, 2003](#)
- [City of Belgrade Growth Policy, January 2020](#)
- [City of Bozeman Growth Policy, June 1, 2009](#)
- [City of Three Forks](#)
- [Town of West Yellowstone, 2017](#)

3.6.1.1 GALLATIN COUNTY GROWTH POLICY

The Gallatin County Growth Policy was adopted in April 2003 as the document intended to help guide future growth and land development in the county. This document is currently being updated with an expected completion date in 2021. It is the community's hope, and the County's commitment, that growth occur in a coordinated, logical, and cost-effective manner that minimizes unplanned, costly sprawl. The growth policy is used to guide land use decisions, and decisions relative to the provision of public facilities and services as well as the conservation and protection of environmentally sensitive lands. In section 3.14, Goal 1 of the plan is to protect human life and property from natural hazards, and includes the following objectives:

- / Encourage development in natural hazard areas to mitigate potential hazard(s).
- / Encourage development on steep slopes to mitigate potential hazards.
 - » Prohibit development and road building on slopes greater than 25 percent.
 - » Support the use of covenants that provide appropriate engineering to mitigate safety concerns of development in areas with potential and demonstrated unstable slopes and soils.
 - » Encourage development to address emergency services access and driveway standards.
- / Restrict development in flood hazard areas to protect property and life from flooding. Encourage compliance with the Floodplain Regulations and the standards developed by the Department of Health.
 - » Encourage development to protect neighboring properties and communities from potential flood hazards associated with new development.
- / Discourage development in areas prone to wildland fire to protect property and life from fires.

- » Encourage mitigation of fire hazards, including creation of defensible space for each structure, prior to final plat.
 - » Encourage reduction of fire fuel loads.
- / Encourage development in geologically or seismically unstable areas to mitigate potential hazards.

Additionally, the plan supports hazard mitigation through the following goals, objectives, and implementation measures:

- / Retention of agricultural lands through voluntary conservation easements and land preservation programs
- / Measures to ensure development are compatible with public safety needs
- / Conservation of surface and ground water and quality

Specific to fire, the policy emphasizes the provision of a reasonable level of fire protection for residents and property owners through defensible space, consideration of water supplies and response times, fuels mapping, and other programs.

3.6.1.2 CITY OF BOZEMAN COMMUNITY PLAN

The City of Bozeman's Community Plan (Growth Policy) was adopted in June 2009. The Plan defines the city's goals and objectives for growth, provides maps and text that describe the characteristics and features of jurisdictional areas, and presents a timetable for implementing elements within the growth policy. Chapter 13 of the plan discusses the city's planning efforts for disaster prevention and response, with wildfire listed as one of the natural hazards present in the Bozeman area. The Community Plan is currently being updated with completion anticipated in 2020.

3.6.1.3 CITY OF BELGRADE GROWTH POLICY

The City of Belgrade's Growth Policy was adopted in 2017. The plan defines the town's goals and objectives for growth, provides maps and text describing the characteristics and features of the area, and presents a timetable for implementing elements within the growth policy. The policy's key identified issues are: Housing Affordability and Availability, Short-Term Commercial Rentals, Developing the 80 Acres, Town Appearance, Zoning in Old Town, Economy, and Water and Sewer.

3.6.1.4 TOWN OF WEST YELLOWSTONE GROWTH POLICY

The Town of West Yellowstone's Growth Policy was adopted in 2020. The plan defines the city's goals and objectives for growth, provides maps and text describing the characteristics and features of the area, and presents a timetable for implementing elements within the growth policy. The policy's goals include; Land and Agriculture, Housing, Economics, Local Services, Public Facilities, Natural Resources and Mobility and Circulation.

3.6.1.5 CITY OF THREE FORKS

The City of Three Forks has a Growth Policy outline and is currently developing a full policy. The plan defines the city's goals and objectives for growth, provides maps and text describing the characteristics and features of the area, and presents a timetable for implementing elements within the growth policy. The policy's goals include; Adequate Circulation Systems, Commercial Vitality, Industrial Vitality, Planned Residential Development, Public Facilities and Development of Land Outside the City.

3.6.1.6 OTHER LOCAL GROWTH POLICIES

Other long-range growth and planning policy and study documents include the Belgrade Growth Policy (2006) and the Gallatin Triangle Planning Study [Sanderson Stewart, 2014], which includes recommendations for regional planning cooperation between Gallatin County and the cities of Belgrade and Bozeman.

3.6.2 SUBDIVISION REGULATIONS

All subdivisions must conform to state and local requirements, specifically the "Gallatin County Subdivision Regulations" in unincorporated areas or the appropriate regulations for the incorporated political subdivision. Purposes of the regulations include the following:

- / Promote public health, safety, and general welfare by regulating the subdivision of land
- / Avoid danger or injury by reason of natural hazard or the lack of water, drainage, access, transportation, or other public improvements

3.6.2.1 SUBDIVISION REGULATIONS

- / [Gallatin County Subdivision Regulations, March 5, 2019](#)
- / [City of Belgrade Subdivision Regulations](#)
- / [City of Bozeman Subdivision Regulations 38.240](#)
- / [Town of Manhattan Subdivision Regulations Title 11](#)
- / [City of Three Forks Subdivision Regulations Title 12](#)
- / [Town of West Yellowstone Subdivision Regulations Title 16](#)

Lands considered unsuitable for development include areas of natural and human-caused hazard, floodways, other waterways, and riparian areas. Subdivisions may be required to have covenants to address public health and safety issues such as mowing to reduce wildfires. Emergency access roads may be required and have their own set of standards. Emergency services may provide the governing body with recommendations for the subdivision (e.g., fire protection standards, water supplies, ingress/egress, and defensible space).

Subdivisions that are located within designated 100-year floodplains (as defined by Section 10 of the Subdivision Regulations), are required to meet certain standards, including:

- / Land located with the 100-year floodplain may be used for the following purposes:
 - Agriculture
 - Open Space
 - Wildlife Habitat
 - Parkland
 - Recreation
- / Any proposed lot that includes land within the 100-year floodplain must contain a designated building site outside of the 100-year floodplain, within which all new development activity (erection of structures, placement of fill, topographic reconfiguration, etc.) shall take place.
 - All structures built on such lot shall be designed and constructed so the lowest-floor elevation within the structure is at least two feet above the base (100-year) flood elevation

- The required lowest-floor elevation for each building site shall be recorded on the plat or other applicable development document (final site plan, Covenants, etc.).
- / Subdivider shall demonstrate that safe access to the designated building site must be possible during the 100-year flood.
- / Subdivisions should be designed to avoid placing subdivision-related infrastructure (roads, bridges, utilities, etc.) within the boundaries of the 100-year floodplain. Infrastructure that must be located within the 100-year floodplain shall not adversely affect public health and safety or increase flood hazards.
 - Bridges constructed inside a subdivision shall be designed so the lowest horizontal chord of the bridge is at least two feet above the base (100-year) flood elevation.

Section 10 of the Gallatin County Subdivision Regulations defines the requirements for completing a flood hazard evaluation for property that is located within a designated 100-year floodplain. The following two paragraphs are the first two sections (A. and B.) within Section 10:

General. Land subject to being flooded by a flood of 100-year frequency as defined by Title 76, Chapter 5, MCA, or land subject to flooding pursuant to these Regulations, shall not be subdivided for building or residential purposes, or other uses that may increase or aggravate flood hazards to life, health or welfare, or that may be prohibited by state or local floodplain or floodway regulations. Land subject to flooding pursuant to these Regulations may include (but is not limited to) land subject to 100-year flooding, 500-year flooding, shallow flooding, groundwater rise, historically flooded lands, and lands located in proximity to a watercourse.



2008 flooding in Outlaw Subdivision north of Bozeman.
Photo courtesy Gallatin County Emergency Management.

Intent. The intent of a flood hazard evaluation is to assess possible flooding hazards to a proposed subdivision and resulting therefrom. Part of this evaluation must therefore address the uncertainty of predicted conditions during significant meteorologic, geologic or hydrologic events, and the evaluation draws upon known and observed flood behaviors and dynamics for context. The flood maps and associated documentation included within the County-recognized flood studies may contain some of this information but do not address the full range of hazards and flooding conditions necessary for a flood hazard evaluation.

4.0 RISK ASSESSMENT/HAZARD PROFILES

In February 2018, public meetings were held in the five community districts to rank identified hazards. Each community district covers one or more population center, which consist of the incorporated cities

and towns as well as the unincorporated Big Sky area. Localized hazard rankings were developed for Belgrade, Big Sky, Bozeman, Manhattan/Three Forks, and West Yellowstone.

Within each community district, identified hazards were ranked for their probability of occurrence and the impacts that would result to the population, property, and economy should the hazard occur. The hazard occurrence probability and each of the potential impact categories were assigned numeric values of 1 (Low), 2 (Moderate), or 3 (High). A weighting method was then applied to the hazard impact values by multiplying the population impact value by 3, the property impact value by 2, and the economy impact value by 1. A final risk value is assigned to each hazard by taking the sum of weighted impact values and multiplying by the hazard probability value.

Each of the identified hazards includes a table at the end of the hazard profile which summarizes the relative overall risk value, both at the community (district) level and as an aggregate value for the county. The calculated numeric risk value is provided in parentheses following the descriptive risk value (Low, Moderate, High), and the range of risk values for each jurisdiction follows in a second parentheses.

4.1 AVALANCHE AND LANDSLIDE

4.1.1 DESCRIPTION

Avalanches and landslides are similar in nature such that both occur when a material on the surface of the earth cannot be supported any longer and gives way to gravity. In the case of an avalanche, the substance is snow, and for a landslide, the substance is mud, rock, or other geologic material. Both can occur rapidly with little warning.

When snow accumulations on a slope cannot be supported any longer, the snow support structure may break and fall creating an avalanche. The subsequent rush of unsupported snow can bury and move things in its path. Most avalanches do not cause any damage; however, occasionally people and property may fall in their paths. Snow avalanches kill more people on national forests than any other natural hazard [USFS, National Avalanche Center, www.avalanche.org]. Each winter, 25 to 30 people die in avalanches in the United States, and nearly all these deaths involve recreation on national forests.

Avalanche formation requires a slope shallow enough for snow to accumulate but steep enough for the snow to accelerate once set in motion by the combination of mechanical failure (of the snowpack) and gravity. The angle of the slope that can hold snow, called the angle of repose, depends on a variety of factors such as crystal form and moisture content. Slopes flatter than 25 degrees or steeper than 60 degrees typically have a lower incidence of avalanches. Human-triggered avalanches have the greatest incidence when the snow's angle of repose is between 35 and 45 degrees; the critical angle, the angle at which human-triggered avalanches are most frequent, is 38 degrees. The rule of thumb is: *A slope that is flat enough to hold snow but steep enough to ski has the potential to generate an avalanche, regardless of the angle.*

In the case of landslides, some move slowly and cause damage gradually, whereas others move quickly enough to destroy property and cause casualties. Gravity is the force driving landslide movement. Factors that allow the force of gravity to overcome the resistance of earth material to landslide movement include saturation by water, steepening of slopes by erosion or construction, alternate freezing and

thawing, earthquake shaking, and volcanic eruptions. Landslides are typically associated with periods of heavy rainfall or rapid snow melt and tend to worsen the effects of flooding that often accompanies these events. In areas burned by forest and brush fires, a lower threshold of precipitation may initiate landslides [FEMA, 1989].

4.1.2 HISTORY

The history of avalanches in Gallatin County is much more pronounced than that of landslides. Both, however, have occurred. Avalanches are a normal occurrence in Gallatin County and typically do not cause significant damages; however, injuries and casualties have occurred. **Figure 4-1** outlines the annual number of fatalities due to avalanches in Montana beginning in 1969.

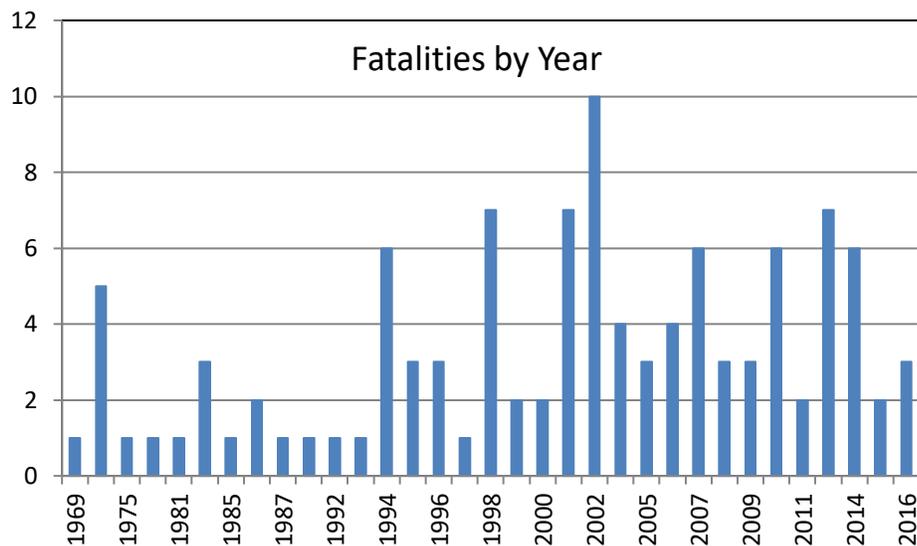


Figure 4-1. Avalanche Fatalities by Avalanche Year [Colorado Avalanche Information Center, US Avalanche Accident Reports for Montana, 2017]

The number of annual fatalities is increasing due to increased use of snowmobiles in the backcountry. Since 1951, 117 people have been killed by avalanches in Montana with numerous additional injuries. Gallatin County has experienced 18 fatalities since 1996. Each incident is detailed below in **Table 4-1**.

Table 4-1. Avalanche Fatalities in Gallatin County [Avalanches.org 2018]

Date	Location	Damage
4/14/2018	Bridger Range	1 sidecountry rider, partially buried, killed
1/2/2018	S. Madison Range	1 snowmobiler buried and killed
10/7/2017	S. Madison Range	2 skiers caught, 1 killed
1/19/2016	N. Madison Range	1 ski patroller caught, partly buried and killed
4/11/2015	N. Madison Range	1 backcountry tourer caught and killed
1/1/2014	N. Gallatin Range	1 snowmobiler caught and killed
2/14/2011	Bridger Range	1 skier triggered, caught and killed
4/14/2010	N. Madison Range	2 snowmobilers caught, 1 killed
12/10/2009	N. Gallatin Range	1 climber caught, partially buried and killed

2/11/2009	West Yellowstone	3 snowmobilers caught, 1 killed
1/20/2008	N. Madison Range	1 skier triggered, caught, buried and killed
3/3/2007	N. Madison Range	1 skier triggered, caught, buried and killed
12/28/2006	S. Madison Range	2 snowmobilers caught, 1 buried and killed
3/24/2002	S. Madison Range	1 snowmobiler triggered, caught and killed
4/4/2001	Bridger Range	1 skier caught, buried and killed
11/26/1999	N. Madison Range	2 skiers caught, 1 buried and killed
3/9/1996	West Yellowstone	1 snowmobiler buried and killed
2/25/1996	West Yellowstone	1 snowmobiler buried and killed

Significant landslides have not been documented in Gallatin County; however, small ones are generally known to have occurred in various locations. Despite the numerous relatively minor incidents in Gallatin County from avalanches and landslides, none were declared state or federal disasters.

4.1.3 PROBABILITY AND MAGNITUDE

The Colorado Avalanche Information Center has compiled statistics on a statewide basis on avalanche fatalities. Montana ranks fifth in the nation with 117 fatalities since 1951. The top three activities being undertaken at the time of an avalanche were backcountry skiing, snowmobiling, and climbing. Ratings have not been compiled for counties within Montana; however, the historical databases show that Gallatin County is one of the more vulnerable counties in the state from avalanche, particularly in the West Yellowstone and Gallatin Canyon areas. **Figure 4-2** below demonstrates that the population is most vulnerable to avalanches during the months of December, January, February, and March.



Wet slab avalanche below Beehive Peak in Northern Madison Range, May 13, 2019.
Photo source: GNFAC, by @cfirer

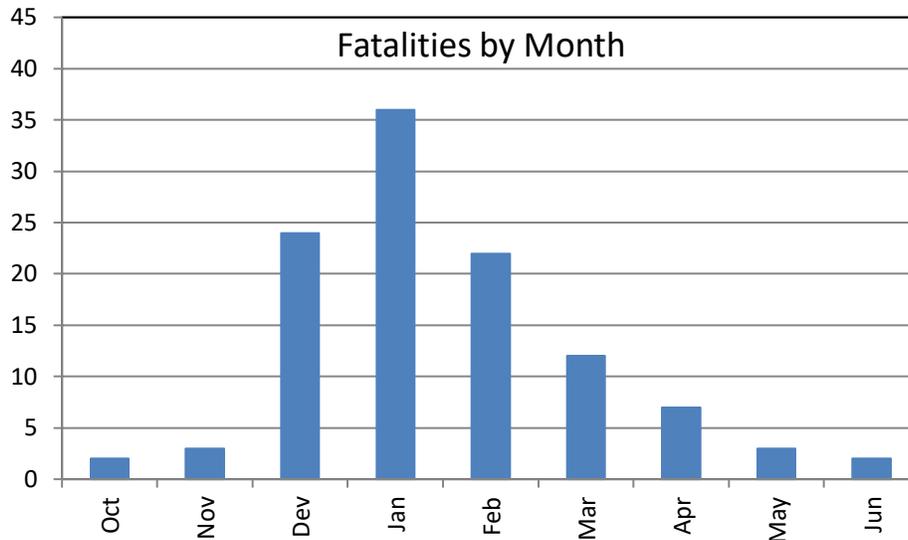


Figure 4-2. Avalanche Fatalities in Montana by Month [Colorado Avalanche Information Center, US Avalanche Accident Reports for Montana, 2017]

Landslides have an even lower probability of creating a disaster based on a very limited history of events. Should landslides occur in this area, they typically do not affect life or property. The probability of a damaging landslide could greatly increase if development were to occur in landslide prone areas. Wildfire burn areas also greatly increase the probability of a landslide triggered by precipitation.

The probability of an avalanche or landslide causing enough damage for a county, state, or federal disaster is considered low based on the historical record.

4.1.4 WARNINGS, WATCHES, AND ADVISORIES

Avalanche warnings may be issued by the National Weather Service (NWS) in conjunction with the Gallatin National Forest Avalanche Center (GNFAC). This type of warning brings attention to severe avalanche dangers. During avalanche season, GNFAC issues detailed advisories outlining the avalanche hazards. The US Avalanche Danger Scale includes the following levels (**Figure 4-3**):

- / **Extreme Avalanche Danger:** Avoid all avalanche terrain. Travel only on gentle slopes well away from areas affected by avalanches.
- / **High Avalanche Danger:** Very dangerous conditions. Travel in avalanche terrain is not recommended. Extensive skill, experience, and local knowledge are essential.
- / **Considerable Avalanche Danger:** Dangerous avalanche conditions. Use conservative decision making, careful route finding, and good travel habits. Training and experience are essential.
- / **Moderate Avalanche Danger:** Dangerous avalanche conditions on some terrain features. Evaluate the snow and terrain carefully and use good travel habits.
- / **Low Avalanche Danger:** Generally safe avalanche conditions. Watch for unstable snow on isolated terrain features.

North American Public Avalanche Danger Scale		
Avalanche danger is determined by the likelihood, size and distribution of avalanches.		
Danger Level		Travel Advice
5 Extreme		Avoid all avalanche terrain.
4 High		Very dangerous avalanche conditions. Travel in avalanche terrain not recommended.
3 Considerable		Dangerous avalanche conditions. Careful snowpack evaluation, cautious route-finding and conservative decision-making essential.
2 Moderate		Heightened avalanche conditions on specific terrain features. Evaluate snow and terrain carefully; identify features of concern.
1 Low		Generally safe avalanche conditions. Watch for unstable snow on isolated terrain features.
No Rating		Watch for signs of unstable snow such as recent avalanches, cracking in the snow, and audible collapsing. Avoid traveling on or under similar slopes.
<i>Safe backcountry travel requires training and experience. You control your own risk by choosing where, when and how you travel.</i>		

Figure 4-3. Avalanche Danger Scale

Destructive landslides are often associated with heavy rains and flash flooding. The NWS issues flash flood watches and warnings. These alerts are likely during potentially significant landslides. The alerts and warnings issued by the NWS include:

- / **Flash Flood Watch:** Flash flood watches inform the public of conditions which may cause short duration, intense flooding from heavy precipitation, snow melt, dam failure, or ice jams within the next 36 hours, but the flooding is neither certain nor imminent.
- / **Flash Flood Warning:** Flash flood warnings are issued when flooding is imminent during short term events requiring immediate action. Flash flooding occurs when the water level rises rapidly to inundation within 6 hours of a causative event (i.e., heavy precipitation, snow melt, dam failure, or ice jams).

Additionally, landslide risk may be increased following a wildfire. The burnt area is often prone to landslides, particularly when combined with heavy rainfall.

4.1.5 MAPPING

Avalanches and landslides are difficult to map, due to their site-specific nature, based on terrain and snow conditions. Geotechnical engineers, engineering geologists and avalanche specialists are typically consulted to assess the avalanche or landslide susceptibility for a specific location. Several organizations, including the GNFAAC (www.mtavalanche.com) and the American Avalanche Institute (www.americanavalancheinstitute.com), offer training courses to recreationists, ski patrol, and search and rescue personnel with the goal of introducing basic concepts of snow science and evaluation of snow and terrain conditions. This knowledge can then be applied practically to promote avalanche hazard mitigation and safe backcountry travel techniques.

4.1.6 VULNERABILITY

4.1.6.1 PROPERTY

Critical facilities in Gallatin County historically have not suffered losses or been threatened by avalanches or landslides. The site-specific threat of avalanches and landslides to critical facilities in Gallatin County can only be realistically determined by a geotechnical engineer or project geologist. More generally, those buildings on flat terrain or surrounded by other structures likely have little vulnerability to landslides and avalanches. Similarly, buildings on steep slopes, at the bottom of hills, or in unstable soils likely have a higher vulnerability to avalanches and landslides.

Critical infrastructure may be at risk from avalanches and landslides. The transportation network is likely the most vulnerable, particularly during periods of heavy rain, snow, or snowmelt. Infrastructure such as power lines could be destroyed by a large landslide or avalanche; however, historical record does not demonstrate this potential. The most probable areas for landslides are on steep slopes, at the bottom of hills, and in unstable soils. Without a detailed soils and slope map depicting the landslide potential, the number of residential structures at risk from landslides is unknown. Similarly, predicting avalanches requires an in-depth understanding of the snow surface and other factors. Fortunately, Gallatin County does not have any history of structures being destroyed by avalanches or landslides.

4.1.6.2 POPULATION

The primary threats to the population from avalanches and landslides are while recreating and driving. Avalanches and landslides can quickly bury and destroy road infrastructure, endangering those on the roadways. Additionally, the population could be threatened by an avalanche or landslide that damages an occupied structure. Most often, avalanches threaten those in hazard areas such as snowmobilers, skier, snowboarders, and climbers.

4.1.6.3 ECONOMY

Widespread economic impacts due to avalanches or landslides are not expected in Gallatin County; however, economic impacts may occur either temporarily or by isolated sectors, such as the recreational snow sport industry. Possible economic losses include commerce losses due to closed roadways, timber losses in avalanche and landslide areas, and tourism losses due to avalanche and landslide concerns.

4.1.6.4 FUTURE DEVELOPMENT

Unless evaluated by a geotechnical engineer or similar professional, new development could occur in landslide and avalanche hazard areas. Some provisions are in place within the county subdivision regulations to restrict development in hazardous areas. More specifically, lands unsuitable for subdivision include potential hazard areas from snow avalanches, rock falls, landslides, steep slopes in excess of 25 percent grade, subsidence, and slumping. These restrictions may prevent subdivisions in the most hazardous areas. Non-subdivision developments may still occur in some hazardous areas and others may have an unknown landslide or avalanche hazard at the time of evaluation.

4.1.7 DATA LIMITATIONS

In general, data on avalanche and landslide hazards in Gallatin County is quite limited. The data limitations include:

- / Limited studies of the hazards for the area
- / Site-specific nature of the hazards

4.1.8 OVERALL HAZARD PROFILE

District / Jurisdiction	Probability of Occurrence	Property Impact	Population Impact	Economic Impact	Overall Risk ¹ (Relative Score) (Range)
Gallatin County	Moderate	Low	Low	Low	Moderate (16) (13-39)
Belgrade	Moderate	Low	Low	Low	Low (12) (6-38)
Big Sky	High	Low	Moderate	Low	Moderate (27) (7-52)
Bozeman	High	Low	Low	Low	Moderate (18) (10-42)
Manhattan/Three Forks	Low	Low	Low	Low	Low (6) (6-37)
West Yellowstone	Moderate	Low	Low	Low	Low (12) (6-49)

¹ Each jurisdiction (district) determined the hazard’s overall risk score by assigning values to ranking metrics that included: 1) probability that the hazard occurs, and 2) potential impacts to property, population and the economy. Criteria for assigning values to the probability and impact metrics and applying weighting factors to the different impact categories can be found in **Section 4.20, Risk Assessment Summary**.

The hazard risk scores for each jurisdiction were consolidated and then averaged to determine an overall risk score at the county level. The countywide risk scores were assigned a risk descriptor (Low, Moderate, High) based on their composite score ranking among all 19 identified hazards and by applying judgment to the final hazard rankings.

4.2 AVIATION ACCIDENT

4.2.1 DESCRIPTION

Aviation accidents can occur for a multitude of reasons ranging from mechanical failure to poor weather conditions to intentional causes. Accidents can vary from small single engine aircraft to large commercial jets. The location of the accident—such as a remote area versus a populated location—also plays an important role in the amount of destruction caused.

Gallatin County has one large and two smaller airports. Bozeman-Yellowstone International Airport (BZN), located in Belgrade, is the largest of the three and the busiest airport in the State of Montana. Progreba Field (9S5) is located in Three Forks and primarily serves smaller single engine aircraft. West Yellowstone Airport (WYS) is located near West Yellowstone and is primarily used in the summer months for tourism to Yellowstone Park and as a base station for fixed and rotor wing wildland firefighting aircraft.

BZN is a full-service commercial airport serving the needs of travelers in the region. BZN also has a significant cargo capacity and private ancillary services. In 2017 the airport served a total of 1,199,537 passengers over 76,223 tower operations and handled over 5 million pounds of cargo. Seven major airlines offer flights with non-stop service to 17 U.S. cities.

Large passenger aircraft serving these airports often fly over Gallatin County. Small aircraft accidents may be relatively minor in nature involving none or few casualties, whereas a large commercial aircraft could create a mass casualty incident requiring outside assistance.

In addition to established airports and fixed wing traffic, helicopters and other aircraft can be found in most other areas of the county. An active wildfire season increases spotting and suppression activities by air and helibases may be set up in many locations. Other locations, such as Bozeman Health Deaconess Hospital, have frequent helicopter traffic conducting medical transports. Two air ambulance companies (Life Flight, Air Idaho) operate in the county providing medical response and transport capabilities. There

are also three private rotor-wing services in the county and several Gallatin County residents have their own personal aircraft operating to and from their property.

4.2.2 HISTORY

Table 4-2 briefly summarizes the aviation accident reports filed by the National Transportation Safety Board (NTSB) from 1996 to 2017.

Table 4-2. Aviation Accidents in Gallatin County [NTSB, 2017]

Date	Location	Aircraft Type	Casualties
7/21/2017	Bozeman	Robinson Helicopter	Nonfatal
3/22/2017	Bozeman	STOL King	Nonfatal
7/8/2015	Belgrade	Pilatus PC12	Nonfatal
6/13/2015	Bozeman	Cessna P210N	Nonfatal
9/16/2013	Bozeman	Piper PA 11	Nonfatal
8/12/2013	West Yellowstone	Beech E35	Fatal
8/1/2013	West Yellowstone	Bellanca 7GBVB	Nonfatal
7/14/2013	Bozeman	Boeing E75	Nonfatal
1/15/2011	Three Forks	Bell 206B3	Nonfatal
8/30/2010	Belgrade	Cessna 182C	Fatal
1/18/2009	Three Forks	Byan Nanon	Nonfatal
10/3/2009	Bozeman	Fisher DAK	Nonfatal
9/5/2009	Bozeman	Piper PA-20	Nonfatal
4/3/2008	Three Forks	Piper PA-22	Nonfatal
7/29/2007	Three Forks	Hughes 269C	Nonfatal
6/24/2007	Bozeman	Cessna 170A	Nonfatal
2/6/2007	Belgrade	Beechcraft 200	Fatal
8/2/2006	Belgrade	Cessna 180A	Fatal
4/14/2006	Belgrade	Cessna 425	Nonfatal
11/29/2005	Belgrade	Cessna 425	Fatal
12/4/2004	Belgrade	Cirrus SR22	Fatal
6/24/2004	Bozeman	Cessna 185F	Nonfatal
3/31/2004	Bozeman	Cessna 305A	Nonfatal
11/5/2002	Bozeman	Riddel IV-P	Fatal
7/31/2002	Belgrade	Blanik L-13	Nonfatal
6/26/2001	Bozeman	Piper PA-38-112	Nonfatal
6/26/2001	Bozeman	Cessna 172M	Nonfatal
3/4/2001	Bozeman	Avia Stroitel AC-5M	Nonfatal
2/8/2001	Bozeman	Piper PA-12	Nonfatal
3/16/2000	Three Forks	Piper PA-18-150	Nonfatal
3/4/2000	Bozeman	Cessna 180H	Nonfatal

Date	Location	Aircraft Type	Casualties
10/20/1999	Bozeman	Piper PA-24-250	Nonfatal
8/21/1999	Belgrade	Cessna 180A	Nonfatal
6/17/1999	Belgrade	Let L-13	Nonfatal
2/15/1998	Bozeman	Piper PA-17	Nonfatal
12/7/1997	Bozeman	Pitts S-2B	Fatal
12/7/1997	Bozeman	Cessna P206A	Fatal
10/5/1996	Big Sky	Aerospatiale SA-315B	Nonfatal
8/25/1996	Bozeman	Forney F-1	Nonfatal
8/3/1996	Belgrade	GS G-164A	Nonfatal

4.2.3 PROBABILITY AND MAGNITUDE

As the historical record demonstrates, the probability for a private, small aircraft accident is much greater than one involving a large commercial jet in Gallatin County. Although an incident involving a commercial passenger flight and mass casualties cannot be ruled out, the probability is considered low. Statistics compiled based on NTSB incident reports over the last 20 years can be found in **Table 4-3**.

Table 4-3. Accident Summary [NTSB, 2017]

Location	Number of Incidents	Fatalities
Bozeman	21	3
Belgrade	12	6
Three Forks	5	0
West Yellowstone	2	1
Big Sky	1	0
Total	41	10

According to the National Transportation and Safety Board, 91 aviation accidents have occurred in Gallatin County since 1965, 34 of which involved fatalities. In this period, there was an average of 1.75 aviation accidents per year, with an average of 0.65 aviation accidents involving fatalities per year.

4.2.4 MAPPING

Aviation incidents can occur both on and off airport facilities. Areas close to airports are theoretically at greater risk due to their proximity to local air traffic, though all areas within the county are vulnerable.

4.2.5 ASSOCIATED HAZARDS AND OTHER FACTORS

The hazard of aviation accidents can involve multiple factors. The two most significant include the location of the accident and the cargo on board. The location of an aviation accident will determine the significance of ground casualties and damages. An aircraft accident in a populated downtown area has a much greater potential for additional casualties and property damage than one that occurs in a remote part of the county. The location also affects the ability of responders to get to the crash site. The mountainous terrain in Gallatin County can make rescues and recovery difficult, particularly during inclement weather. The cargo is an important factor, if such cargo would create a hazardous material release or increased fire hazard. Should the contents of the aircraft be hazardous, the situation would need to be treated not only

as an aviation accident but also as a contaminated site. The possibility of an aviation accident as an intentional act cannot be ruled out, in which case the accident site would also become a crime scene and possibly involve mass casualties.

Any hazard that involves aircraft in the response or recovery could have an aircraft accident as an associated hazard. The helicopter crash during the Fridley Fire in adjacent Park County in 2001 is an example, where a firefighting helicopter crashed during bucket operations. Other possibilities include supply aircraft hauling recovery materials following an earthquake or flood.

4.2.6 VULNERABILITY

4.2.6.1 PROPERTY

All critical facilities in Gallatin County are at risk from aircraft accidents. Given the nature of historical events and the probability of a specific facility being hit, the overall vulnerability of any given critical facility is considered very low. Bozeman Health Deaconess Hospital and Big Sky Medical center, however, have been identified as facilities at an increased risk due to the helicopter medical transport operations conducted there. Both physical infrastructure and critical functionality losses are possible.

All above-ground critical infrastructure is at risk from aviation accidents, as well as some below-ground infrastructure. Tall communications towers and power lines carry a slightly elevated risk, due to their elevation. Critical infrastructure damage may result in loss of functionality.

All structures are at risk from aircraft accidents, though the likelihood of an accident impacting any given structure is extremely low. If an aircraft directly impacted a residential structure, damages could vary in the tens or hundreds of thousands of dollars, depending on the structure and nature of the accident. Both structure and content losses could be incurred.

4.2.6.2 POPULATION

Aviation accidents pose the greatest threat to the population, due to the history of fatalities in Gallatin County. In accidents, the impact on population is dependent on the type of aircraft involved, the number of people on board, the location of the accident, and the number of people in the area of the crash site. Typically, with aircraft accidents, very little warning exists so the population would be unaware until after the event occurred.

4.2.6.3 ECONOMY

Tourism and recreation are significant economic drivers in Gallatin County. Aviation accidents large enough to prevent or otherwise deter future tourists from entering the area could have a significant impact on the local economy. Additional possible economic losses include localized agriculture or business losses, and business and revenue losses due to decreased tourism. Losses in the Belgrade area may be slightly higher, as the primary airport of the region is located just outside city limits.

4.2.6.4 FUTURE DEVELOPMENT

Due to the unpredictable location of aircraft accidents, the impact of future development is generally the same regardless of where that development occurs, with a possible exception being the immediate airport vicinity. Therefore, the impact of future development is considered minimal.

4.2.7 DATA LIMITATIONS

Data limitations related to the aviation accident hazard include difficulty in predicting where future aircraft accidents will occur.

4.2.8 OVERALL HAZARD PROFILE

District / Jurisdiction	Probability of Occurrence	Property Impact	Population Impact	Economic Impact	Overall Risk ¹ (Relative Score) (Range)
Gallatin County	Moderate	Low	Low	Low	Low (15) (13-39)
Belgrade	Moderate	Low	Low	Moderate	Moderate (16) (6-38)
Big Sky	Moderate	Low	Low	Low	Low (12) (7-52)
Bozeman	Moderate	Low	Low	Low	Low (12) (10-42)
Manhattan/Three Forks	Moderate	Low	Low	Low	Low (17) (6-37)
West Yellowstone	Moderate	Low	Low	Low	Low (12) (6-49)

¹ Each jurisdiction (district) determined the hazard’s overall risk score by assigning values to ranking metrics that included: 1) probability that the hazard occurs, and 2) potential impacts to property, population and the economy. Criteria for assigning values to the probability and impact metrics and applying weighting factors to the different impact categories can be found in **Section 4.20, Risk Assessment Summary**.

The hazard risk scores for each jurisdiction were consolidated and then averaged to determine an overall risk score at the county level. The countywide risk scores were assigned a risk descriptor (Low, Moderate, High) based on their composite score ranking among all 19 identified hazards and by applying judgment to the final hazard rankings.

4.3 CIVIL UNREST

4.3.1 DESCRIPTION

Civil unrest, or disobedience, typically occurs when large groups, organizations, or distraught individuals act with potentially disastrous or disruptive results. Civil unrest can be the product of another event that creates panic in the community. Within the past year there have been several instances of civil unrest that have gained national attention; an armed standoff in defiance of federal land policies at the Malheur National Wildfire Refuse near Burns, Oregon, and the Dakota Access Pipeline, Standing Rock protests in the Dakotas over potential impacts to drinking water and cultural sites, to name a few.

Gallatin County has a politically and socially active populace, and as such many events and protests are held in the County each year. While historically these protests are both peaceful and lawful, the potential exists for any event to escalate into civil unrest.



2009 Presidential visit. Unknown photographer.

4.3.2 HISTORY

Fortunately, Gallatin County has not experienced major incidents in which civil unrest caused notable damages or injuries. In recent years isolated events have occurred in which rapid police response de-escalated situations which had the potential to develop into civil unrest. Examples include a protest in front of the Bozeman Islamic Center, in which a masked man was seen openly carrying a shotgun while

protesting, as well as the anti-gay protest held at MSU by the Westboro church, in which hundreds of community members staged a simultaneous counter-protest. Another example of civil unrest that has occurred numerous times over many years are the protests near Yellowstone National Park to stop the harassment and roundup of bison due to their threat of spreading brucellosis.

4.3.3 PROBABILITY

With very little experience and data locally on this hazard, a specific probability for future civil unrest is hard to determine. Based on the historical record and ability of law enforcement to rapidly identify and deescalate potential civil unrest situations, the probability of a large-scale civil unrest is considered low.

4.3.4 MAPPING

The City of Bozeman is the most populous part of Gallatin County. Thus, this area is most likely to experience civil unrest. However, civil unrest can occur anywhere people are able to meet, and thus the risk is considered present in all jurisdictions and throughout the entire county.

4.3.5 ASSOCIATED HAZARDS AND OTHER FACTORS

Civil unrest is often triggered by an emotionally charged event or outcome. Once initiated, it can lead to other hazards such as violence.

4.3.6 VULNERABILITY

4.3.6.1 PROPERTY

Critical facilities in Gallatin County are at low risk from civil unrest. While damage is possible, it is considered unlikely. Residential and business property losses are considered the most likely structure losses. Looting is commonly found in association with these types of events. Urban areas, places of public gathering, and important government or economic assets are generally going to be the areas of greatest risk.

4.3.6.2 POPULATION

The effects of civil unrest can be felt by the population, though usually on a limited scale, in comparison with other human-caused violence such as terrorism. The greatest risk is to human lives during times of unrest.

4.3.6.3 ECONOMY

Economic losses will vary dramatically depending upon the incident. Small, isolated incidents are unlikely to have a major impact on the local economy. Large, nationally publicized incidents have the potential to deter tourism.

4.3.6.4 FUTURE DEVELOPMENT

Development should have little impact on the civil unrest threat. The exception would be the increase in population and associated large venues for gatherings with the potential to hold large events..

4.3.7 DATA LIMITATIONS

Since civil unrest incidents tend to be isolated events, and little history exists in Gallatin County, the probability and potential losses are difficult to quantify. Therefore, generalities have been made to

estimate where potential losses could be. Site specific surveys would allow for an analysis of weaknesses of critical facilities, infrastructure, and vulnerable populations to civil unrest incidents.

4.3.8 OVERALL HAZARD PROFILE

District / Jurisdiction	Probability of Occurrence	Property Impact	Population Impact	Economic Impact	Overall Risk ¹ (Relative Score) (Range)
Gallatin County	Moderate	Low	Moderate	Moderate	Moderate (16) (13-39)
Belgrade	Low	Low	Moderate	Moderate	Low (10) (6-38)
Big Sky	Moderate	Low	Moderate	Moderate	Moderate (20) (7-52)
Bozeman	Moderate	Low	Moderate	Moderate	Moderate (20) (10-42)
Manhattan/Three Forks	Moderate	Low	Low	Low	Low (12) (6-37)
West Yellowstone	Moderate	Moderate	Moderate	Moderate	Moderate (21) (6-49)

¹ Each jurisdiction (district) determined the hazard's overall risk score by assigning values to ranking metrics that included: 1) probability that the hazard occurs, and 2) potential impacts to property, population and the economy. Criteria for assigning values to the probability and impact metrics and applying weighting factors to the different impact categories can be found in **Section 4.20, Risk Assessment Summary**.

The hazard risk scores for each jurisdiction were consolidated and then averaged to determine an overall risk score at the county level. The countywide risk scores were assigned a risk descriptor (Low, Moderate, High) based on their composite score ranking among all 19 identified hazards and by applying judgment to the final hazard rankings.

4.4 COMMUNICABLE DISEASE AND BIOTERRORISM

4.4.1 DESCRIPTION

Diseases affect humans, animals, and plants continuously. Each species has its own natural immune system to ward off most diseases. The causes and significance of diseases vary. Of significance in the disaster prevention realm are communicable diseases with the potential for high infection rates in humans or those which might necessitate the destruction of livestock or crops. Such diseases can devastate human populations and the economy.

Disease transmission may occur naturally or intentionally, as in the case of bioterrorism, and infect populations rapidly with little notice. New diseases regularly emerge or mutate. Known diseases, such as influenza, can be particularly severe in any given season. Terrorism experts also theorize the possibility of attacks using biological agents.

4.4.1.1 HUMAN DISEASE

Human epidemics may lead to quarantines, large-scale medical needs, and mass fatalities. Typically, the elderly, young children, and those with suppressed immune systems are at greatest risk from communicable diseases. The following biologic agents are considered the highest bioterrorism threats (Category A) because of their ease of dissemination or person-to-person transmission, high mortality rate with potential for major public health impacts, potential for public panic and social disruption, and the necessity for special public health preparedness [Centers for Disease Control and Prevention (CDC), 2016]:

- / Anthrax
- / Botulism
- / Plague

- / Smallpox
- / Tularemia
- / Viral Hemorrhagic Fevers

In addition to global disease and bioterrorism concerns, naturally occurring diseases can threaten communities. Natural illnesses of particular concern, among others, include:

- / Food-borne illnesses, such as E. Coli and Salmonella
- / Influenza
- / Meningitis
- / Pertussis/Whooping Cough
- / Measles
- / Norwalk Virus
- / Severe Acute Respiratory Syndrome (SARS)

These diseases can infect populations rapidly, particularly in large-group settings such as schools, assisted living facilities, and workplaces.



Photo of measles rash (CDC via Getty Images). Early 2019 saw the highest number of measles cases in the U.S. in 20 years.

Well-developed surveillance and epidemiologic capacity are the foundation on which health departments detect, evaluate, and mitigate disease and bioterrorism impacts. Complementing the need for accurate and timely case reports is the need for expertise to analyze the information properly. Epidemiologic expertise is critical to judging whether the incident involves biological or chemical agents or is a consequence of a natural phenomenon, an accident, or terrorism. Extraordinary measures are not necessary to develop a comprehensive terrorism health surveillance and epidemiologic network. Initiating partnerships and developing new or pre-existing data links have always been components of public health systems while using current technology to promote timely disease identification and reporting.

Gallatin County Public Health Department possesses the legal authority to receive reports and investigate unusual illness clusters. The health care system lacks the capabilities needed to effectively handle large numbers of victims.

4.4.1.2 ANIMAL DISEASE

Gallatin County is an agricultural and ranching community. Animal diseases, particularly those that infect livestock, can distress the agricultural community. Such diseases could lead to food shortages and negative economic impacts, depending on the animals infected and the geographic extent of the disease. Diseases or conditions requiring state and federal reporting and quarantine include [Montana Department of Livestock, 2015]:

- / Acute swine erysipelas
- / African horse sickness
- / African swine fever
- / Avian influenza
- / Bovine babesiosis
- / Bovine spongiform encephalopathy
- / Brucellosis
- / Cattle fever tick
- / Chronic wasting disease
- / Classical swine fever
- / Contagious equine metritis
- / Dourine
- / Equine encephalomyelitis
- / Equine infectious anemia
- / Equine piroplasmiasis
- / Exotic Newcastle disease
- / Foot and mouth disease
- / Fowl typhoid
- / Glanders
- / Heartwater
- / Japanese encephalitis
- / Lumpy skin disease
- / Malignant catarrhal fever
- / Mange
- / Nairobi sheep disease
- / New and Old-World Screwworm
- / Nipah virus encephalitis
- / Peste des petits ruminants
- / Porcine Epidemic Diarrhea PEDv
- / Pseudorabies
- / Rabbit hemorrhagic disease

- / Rift Valley Fever
- / Rinderpest
- / Scrapie
- / Sheep pox and goat pox
- / Surra
- / Swine influenza
- / Swine vesicular disease
- / Trypanosomosis
- / Tuberculosis
- / Vesicular exanthema
- / Vesicular stomatitis
- / Viral hemorrhagic septicemia

Diseases or conditions requiring state reporting and quarantine include:

- / Anthrax
- / Bluetongue
- / Contagious agalactia
- / Contagious caprine
- / Pleuropneumonia
- / Contagious foot rot
- / Crimean Congo hemorrhagic fever
- / Equine viral arteritis
- / Equine rhinopneumonitis, neurologic form
- / Ovine pediculosis
- / Plague
- / Pullorum disease
- / S. Pullorum
- / Q-Fever
- / Rabies
- / Theileriosis
- / Trichomonosis
- / Tularemia
- / West Nile Virus

4.4.1.3 PLANT DISEASE

Many plant and crop diseases exist. Of most concern are those diseases that spread rapidly and cause widespread economic losses. The specific diseases that could cause plant epidemics depend on the species. Of specific concern in Gallatin County would be those diseases that affect forage/hay, barley,

wheat, oats, or potatoes. Although not categorized as a disease, new pests and weeds introduced could have similar impacts.

4.4.2 HISTORY

Diseases are a part of everyday life. In cases where disease significantly impacts the population actions can be taken to prevent additional infection. Most recently, a statewide measles outbreak in 1988 was noted by the Gallatin County Health Department. Approximately three human influenza pandemics have occurred over the past 100 years, one severely affecting the United States. Following World War I, the Spanish influenza pandemic of 1918 killed 20-40 million people worldwide, including 675,000 Americans [Billings, 1997]. In the State of Montana, the Spanish influenza caused 9.9 deaths per 1,000 people from 1918-1919 [Brainerd, 2002]. In 2008, an outbreak of the infectious disease anthrax killed 25 domestic bison on the Flying D Ranch southwest of Bozeman.

4.4.3 PROBABILITY AND MAGNITUDE

Quantifying the probability of a human epidemic affecting Gallatin County presents challenges due to a limited history of outbreaks. Data documenting disease outbreak in recent years has been compiled by the Montana Department of Public Health and Human Services and is listed in **Table 4-4**. Blank cells indicate data was not available.

Table 4-4. Documented Communicable Disease in Gallatin County [Montana Department of Public Health and Human Services, 2018]

	2009	2010	2011	2012	2013	2014	2015	2016	2017
Acute Flaccid Myelitis							0		
Brucellosis			0				0		
Campylobacteriosis	32	27	36	31	25	34	44	40	44
Chikungunya virus				0			0	0	
Chlamydia	243	233	276	326	327	348	412	522	542
Coccidioidomycosis	2	0	0	1	0	0	2	0	3
Colorado Tick Fever			2	0		0	0		0
Creutzfeldt-Jakob Disease			0			0	0	0	1
Cryptosporidiosis	18	9	2	5	10	10	6	13	13
Cyclosporiasis						2	0		1
Dengue	1	0	0	0	1	0	1	1	0
Ehrlichiosis					0		0	1	
Giardiasis	21	19	10	10	18	19	15	33	24
Gonorrhea	4	12	3	3	3	10	26	32	29
Haemophilus influenzae			0	2	0	0	0	2	0
Hantavirus Pulmonary Syndrome			0	0	1	0	0		
Hemolytic Uremic Syndrome (HUS)	0	1	0	0		0	0	0	0
Hepatitis A, Acute	2	0	0	2	0	0	1	0	2
Hepatitis B, Acute	0		0	0	1		1	1	
Hepatitis B, Chronic			2	5	1	3	1	3	3

	2009	2010	2011	2012	2013	2014	2015	2016	2017
Hepatitis C, Acute	0	0	0	0	0	0	0	0	1
Hepatitis C, Chronic					43	52	52	68	48
HIV			1	1	1	0	2	5	2
Legionellosis	1	0	0	0	0	1	0	0	1
Listeriosis	0		1	0		0	0	0	1
Lyme Disease	1	0	3	1	3	2	0	3	2
Malaria	0	0	1			1	1	1	2
Meningococcal Disease	2	0	0	1	0	0	0	0	0
Pertussis	9	9	49	25	25	39	25	5	1
Q Fever		0	0	0	0	1	1	0	0
Rabies, Animal	0	3	1	0	0	2	0	1	3
Shiga-toxin producing E. coli (STEC)	1	4	5	9	11	5	15	22	11
Salmonellosis	18	11	19	9	15	14	23	12	20
Shigellosis	0	2	5	0	5	1	4	3	1
Spotted Fever Rickettsiosis					0	2	0	2	0
Streptococcal Toxic-Shock Synd.						2	0	1	3
Streptococcus pneumoniae	0	0	0	2	0	0	0	2	5
Syphilis	0	1	0	1	0	0	2	1	3
Tuberculosis	2	0	1	0	0	0	0	1	0
Tularemia	0	0	1	0	0	0	1	0	1
Varicella		12	16	6	8	8	8	4	6
West Nile	0	0	0	0	0	0	0	0	1

Medical advances over the past 50 years prevent many disease outbreaks, yet the potential remains. Gallatin County is a popular tourist destination and has a substantial transient population due to Montana State University and Gallatin College students. Travelers that pass through the county after being exposed to a disease could potentially start an epidemic. Lacking the resources of larger population areas, any exposure to one of these diseases could quickly overwhelm county public health capabilities.

Animal and plant disease outbreaks are even harder to predict. Most global livestock diseases have been confined to specific countries due to strict import regulations. Any plant disease outbreaks have been relatively easily contained.

The magnitude of a communicable disease outbreak varies from every-day disease occurrences to widespread infection. During the 1918 Influenza Pandemic, infection rates approached 28% in the United States (Billings, 1997). Such a pandemic affecting Gallatin County represents a severe magnitude event. Almost any highly contagious, incapacitating disease that enters the regional population could overwhelm local health resources. Similarly, any rapidly spreading bioterrorism event for which little vaccination or containment capability exists is a high magnitude event.

4.4.4 MAPPING

The communicable disease hazard is uniform across the county, and therefore, mapping does not enhance this hazard profile. Urban areas may be slightly more vulnerable to the rapid spread of human disease; however, rural areas are more vulnerable to plant and animal disease.

4.4.5 ASSOCIATED HAZARDS AND OTHER FACTORS

Other diseases such as those that result in the loss or contamination of potable water or sanitary services may result in an increased probability of disease. Often disease is a concern following a large-scale disaster. The time of year and weather conditions may also be a factor in the development of an epidemic. A bioterrorism event may be tied to or done in conjunction with a larger scale terrorism event.

4.4.6 VULNERABILITY

4.4.6.1 PROPERTY

In general, critical facilities are not structurally threatened by communicable disease and bioterrorism; however, their accessibility and function can be lost. Contamination of a critical facility could render the facility non-functional until decontamination or the threat has passed. With the loss of function of facilities supporting emergency response, delays in emergency services could result. Additionally, with a significant human disease outbreak, resources such as ambulance services and the hospitals could quickly become overwhelmed. This is especially true in rural areas, such as Manhattan and Three Forks, where limited resources exist and replacing any affected staff would be difficult due to a limited population.

Should a building become contaminated by some disease agent, cleanup costs and the loss of use of the buildings could result. Such costs could be significant. For this reason, all critical facilities are assumed to be at some risk from communicable disease.

Diseases can spread quickly in facilities housing vulnerable populations such as schools and elderly housing. Often these facilities, as well as the hospitals and medical clinics, are the first places where diseases are identified and treated.

In most cases, infrastructure would not be affected by communicable disease. Scenarios that would affect infrastructure include the contamination of the water supplies and diseases that require special provisions in the treatment of wastewater. Should an epidemic necessitate a quarantine or incapacitate a significant portion of the population, support of and physical repairs to infrastructure may be delayed, and services may be disrupted for a time due to limitations in getting affected employees to work.

The structural integrities of residential buildings are not generally threatened by communicable disease. As with critical facilities, should a structure become contaminated, cleanup costs could be expensive.

4.4.6.2 POPULATION

Perhaps the most significant impact from communicable disease is to the population. Disease can spread rapidly through schools, universities, health facilities, and communities. The entire county population of 111,876 (2018 estimate, US Census Bureau) plus non-residents are at risk for contracting a communicable disease. The Institute for Tourism and Recreation Research (ITRR) at the University of Montana reported nearly 2,000,000 non-resident visitors to Bozeman alone in 2017 [ITRR, 2018], meaning a significant number of persons could be affected by communicable disease. The number of infections

and fatalities would depend on the transmission and mortality rates. In the case of human disease, residents and visitors in urban areas such as Bozeman, Belgrade, Big Sky, and West Yellowstone are most at risk.

Using a general estimate of 35 percent for the infection rate and a mortality rate (once infected) of 20%, as can be the case in an influenza pandemic, approximately 39,157 residents of Gallatin County could be infected, with about 7,832 fatal infections. This estimate is extreme but uses plausible infection and mortality rates.

As with any disease, age and other health conditions can be a contributing factor. The ability to control the spread of disease depends on the virulence of the disease, the time lapse before the onset of symptoms, the movement of the population, and the warning time involved. Vaccinations, anti-virals, quarantines, and other protective measures may also prevent the spread and impact of the disease. Besides human diseases, animal and plant diseases could negatively affect agriculture and limit food supplies.

4.4.6.3 ECONOMY

Potential economic impacts include service industry losses during human quarantines and limited travel, business interruptions due to a lack of workers and customers during human outbreaks, and direct agricultural losses during animal or plant disease outbreaks. Areas which depend almost exclusively on tourism, such as West Yellowstone, are most susceptible to economic losses associated with communicable disease.

4.4.6.4 IMPACT OF FUTURE DEVELOPMENT

Future development would have little impact on the communicable disease vulnerabilities, unless the new structures regularly processed or handled biological disease agents. New residents add to the number of people threatened in Gallatin County, but the location of such population increases is unlikely to affect the overall hazard.

4.4.7 DATA LIMITATIONS

The data limitations related to the communicable disease and bioterrorism hazard include:

- / Uncertainties related to how and when a disease will spread through a population
- / The emergence of new, unstudied diseases

4.4.8 OVERALL HAZARD PROFILE

District / Jurisdiction	Probability of Occurrence	Property Impact	Population Impact	Economic Impact	Overall Risk ¹ (Relative Score) (Range)
Gallatin County	Moderate	Low	Moderate	Moderate	Moderate (25) (13-39)
Belgrade	Moderate	Low	High	Moderate	Moderate (19) (6-38)
Big Sky	Moderate	Low	High	Moderate	Moderate (23) (7-52)
Bozeman	Moderate	Low	High	High	High (28) (10-42)
Manhattan/Three Forks	Moderate	Moderate	Moderate	Moderate	Moderate (24) (6-37)
West Yellowstone	Moderate	Low	High	High	Moderate (30) (6-49)

¹ Each jurisdiction (district) determined the hazard's overall risk score by assigning values to ranking metrics that included: 1) probability that the hazard occurs, and 2) potential impacts to property, population and the economy. Criteria for assigning values

to the probability and impact metrics and applying weighting factors to the different impact categories can be found in **Section 4.20, Risk Assessment Summary**.

The hazard risk scores for each jurisdiction were consolidated and then averaged to determine an overall risk score at the county level. The countywide risk scores were assigned a risk descriptor (Low, Moderate, High) based on their composite score ranking among all 19 identified hazards and by applying judgment to the final hazard rankings.

4.5 CRITICAL INFRASTRUCTURE DISRUPTION (INCLUDES CYBER-SECURITY)

4.5.1 DESCRIPTION

Critical infrastructure disruption, which can include utility outages and building/infrastructure closures, can be caused by almost any of the hazards described in this risk assessment or because of human error or equipment failures. Electric, gas, water, telephone and internet are all important services that could become problematic should a long-term outage occur. Electricity is used to power many homes in Gallatin County, to pump wells, and run heating systems, even if electricity is not the primary fuel source. Therefore, if electricity was lost for a long period of time, many residents could be without heat, water, and other appliances. Vulnerable populations needing powered medical equipment would be additionally threatened by a long-term power outage. Natural gas is used as a heat source for many residents in the northern half of Gallatin County. Should that utility be lost in the winter months, the concerns associated with extended cold could be significant. Telephone services are most critical for 911 communications, and the rapid dispatch of needed emergency services. Cell phones would also be lost if telephone service went down. Many of the larger communities in Gallatin County have public water supplies. Should those services be lost, many citizens would be without water and possibly sewer services. Any of these disruptions can be handled in a short time frame but can quickly become problematic in long term situations.

4.5.2 HISTORY

Gallatin County has not had any significant utility outages that can be considered disastrous, though short-term and minor disruptions are common.

4.5.3 PROBABILITY

Due to the history of critical infrastructure disruptions, the probability of a major critical infrastructure disruption in Gallatin County is considered moderate. As growth occurs, the ability of many of the utility systems to keep up with the increased demand may increase the probability of a long-term outage.

West Yellowstone is at increased risk of utility outages, as propane used by the city is delivered via truck daily, and the city is only able to maintain a small amount of fuel reserves. The city is only accessible via US Highways 191 and 20. Should one or both routes become inaccessible, a fuel shortage would rapidly develop in the area. As such, the probability of a critical infrastructure disruption is considered high in West Yellowstone.

4.5.4 MAPPING

Many of the public utility features in Gallatin County have yet to be mapped and those that have been mapped are withheld for system security purposes. Mapping is maintained by the entity managing the utility.

4.5.5 ASSOCIATED HAZARDS AND OTHER FACTORS

Critical infrastructure disruption can be caused by many of the hazards described in these profiles. Anything from an earthquake to a terrorist event could cause utilities to fail. Events that utility systems are particularly vulnerable to include earthquakes, floods, severe thunderstorms, tornadoes, high winds, winter storms, wildfires, and dam breaks.

4.5.6 VULNERABILITY

4.5.6.1 PROPERTY

Critical facilities are vulnerable to utility outages. Some critical facilities do have back-up generators in case of an electricity outage. Most emergency services facilities, to include the 911 dispatch center and the emergency operations center have back up power. Others, however, may have limited functionality following an event due to a utility failure or critical infrastructure disruption.

Critical infrastructure disruptions typically do not impact structures directly. A long-term utility outage during extended cold could result in numerous frozen water pipes inside homes and businesses. Most often, economic losses occur during long-term utility outages. These losses would be most felt by businesses that require electricity or water to operate.

4.5.6.2 POPULATION

Without services such as heated shelters, food, and drinking water, the population could suffer. Significant casualties would not be expected since these services could be available in a nearby community. If not, necessary sheltering and feeding provisions would be made to protect the population. Significant relocations of vulnerable populations and disruption of normal lifestyles would be expected.

Populations in urban areas would be most vulnerable to critical infrastructure disruptions, as people in these communities are more likely to rely on the infrastructure to fulfill daily needs. Examples include sanitary systems, and heat. Rural areas outside of the incorporated cities and towns may have a higher portion of the population which utilize on-site water, sewer, and fuel storage, and thus rely less on critical infrastructure.

As noted previously, West Yellowstone is particularly vulnerable to heating fuel disruptions due to the need to import fuel daily. Should conditions prevent or delay several deliveries, a substantial portion of the population would be left with no way to heat their homes. Depending on temperature and season, this could have a disastrous impact on the population.

4.5.6.3 ECONOMY

A critical infrastructure disruption often causes temporary business closures, as most businesses rely on internet and telecommunications services to process payments, and other utilities for production, sanitation, and employee wellbeing. These disruptions are expected to be more pronounced in areas with significant tourism, as visitors are likely to leave the area if critical services and utilities are not available.

4.5.6.4 FUTURE DEVELOPMENT

Future development is not expected to have significant impact on this hazard. Increased populations add to the challenges of managing a long-term utility outage but would not increase the damages necessarily.

4.5.7 DATA LIMITATIONS

Since long term utility outages are not a normal event for Gallatin County, understanding the specific problems and concerns of this hazard are the greatest limitation. Studies of each of the critical facilities would allow for a more in-depth discussion of their vulnerabilities.

4.5.8 OVERALL HAZARD PROFILE

District / Jurisdiction	Probability of Occurrence	Property Impact	Population Impact	Economic Impact	Overall Risk ¹ (Relative Score) (Range)
Gallatin County	Moderate	Moderate	High	Moderate	High (32) (13-39)
Belgrade	Moderate	Moderate	High	High	High (36) (6-38)
Big Sky	Moderate	Moderate	High	Moderate	High (35) (7-52)
Bozeman	Moderate	Moderate	High	Moderate	High (34) (10-42)
Manhattan/Three Forks	Moderate	Moderate	Moderate	Moderate	Moderate (25) (6-37)
West Yellowstone	High	Moderate	High	High	High (47) (6-49)

¹ Each jurisdiction (district) determined the hazard's overall risk score by assigning values to ranking metrics that included: 1) probability that the hazard occurs, and 2) potential impacts to property, population and the economy. Criteria for assigning values to the probability and impact metrics and applying weighting factors to the different impact categories can be found in **Section 4.20, Risk Assessment Summary**.

The hazard risk scores for each jurisdiction were consolidated and then averaged to determine an overall risk score at the county level. The countywide risk scores were assigned a risk descriptor (Low, Moderate, High) based on their composite score ranking among all 19 identified hazards and by applying judgment to the final hazard rankings.

4.6 DAM FAILURE

4.6.1 DESCRIPTION

Dams have been constructed throughout Montana for various reasons including recreation, flood control, irrigation, water supply, hydroelectricity, and mining. Dams are built and owned by a variety of entities such as private individuals, businesses, and government. The structural integrity of a dam depends on its design, maintenance, and weather/drainage situation. Dam failure occurs when the forces of gravity or other external forces overcome the structural integrity of a dam. The reasons for failure can include poor construction, deterioration, extreme winds, and earthquakes. When dams fail the resulting flow can be compared to riverine or flash flooding in the area downstream from the dam. Problems arise when a dam fails, and people and/or property lie in the inundation area.

Hazard ratings are assigned to dams for emergency management planning purposes. These ratings are based on the potential for loss of life and property damage should the dam fail, and do not reflect the condition or probability of dam failure. Definitions, as accepted by FEMA (FEMA, 2004), are as follows:

- / **Low Hazard Potential:** Dam failure or mis-operation results in no probable loss of human life and low economic and/or environmental losses. Losses are principally limited to the owner's property.
- / **Significant Hazard Potential:** Dam failure or mis-operation results in no probable loss of human life but can cause economic loss, environmental damages, disruption of lifeline facilities, or can impact other concerns.
- / **High Hazard Potential:** Dam failure or improper operation is likely to cause loss of life.



Hyalite Reservoir, 2011. Photo courtesy Patrick Lonergan & Summit Air Ambulance.

Gallatin County has, or could be affected by, six high hazard dams, one significant hazard dam, and four low hazard dams as shown in **Table 4-5**.

Table 4-5. Dams Located in Gallatin County (or with potential significant impacts to the county) [National Inventory of Dams, 2017]

	Hazard Rating	Height (ft)	Storage (acre-ft)	Dam Purpose	Year Constructed	River	Owner
Big Sky Dam/Lake Levinsky ¹ (Madison County)	High	52	172	Recreation/ Water Supply	1973	Middle Fork of West Fork Gallatin River	Boyne USA
Golden Meadow	Low	8	63	Stock	1974	Meadow Creek	Higgins Brothers
Green Hollow Creek Dam	High	45	300	Recreation	1990	Green Hollow Creek	Turner Enterprises, Inc.
Hebgen Dam	High	120	525,620	Flood Control, Hydroelectric	1915	Madison River	Northwestern Energy
Kistner Hardy Dam	Significant	8	70	Stock	1945	S. Fork Muddy Creek	Robert Weyerhaeuser
Madison Dam ² (Ennis Lake, Madison County)	High	39	42,053	Hydroelectric, Recreation	1906	Madison River	NorthWestern Energy
Middle Creek (Hyalite) Dam	High	125	10,184	Irrigation, Water Supply	1951	Middle Creek	Montana DNRC
Pacabo	Low	15	69	Fire Protection, Stock	1956	Darlington Ditch	Harry Gillingham
Real Close	Low	20	52	Irrigation	1963	Duck Creek	Rupert D Koelza
Schutter Reservoir	Low	17	200	Irrigation	Not Available	N/A	Cliff Schutter
Willow Creek Dam ³ (Madison County)	High	105	18,000	Irrigation, Recreation	1938	Willow Creek, Dry Hollow Ck, Norwegian Ck	Montana DNRC

¹ Big Sky Dam/Lake Levinsky is located in Madison County, approximately 1 mile west of the Gallatin County boundary. It is included in this table because the effects of a dam failure would occur almost entirely within Gallatin County.

² Madison Dam/Ennis Lake is located in Madison County, approximately 9 miles south of MT Highway 84. It is included in this table because the effects of a dam failure could impact portions of Gallatin County.

³ Willow Creek Dam/Reservoir (Harrison Lake) is located in Madison County, approximately 3 miles southwest of the Gallatin County boundary. It is included in this table because the effects of a dam failure could significantly impact portions of Gallatin County.

4.6.2 HISTORY

There are no known accidental dam breaks in the history of Gallatin County. Several dams have purposely been breached for various reasons in the past. The most recent was the Mystic Lake Dam in Sourdough Canyon, this dam was breached as a mitigation measure to prevent a future failure. The Mystic Lake Dam was a water retention dam for the City of Bozeman water supply.

In August 2008, two of the mechanical outlet gates at the Hebgen Lake Dam failed causing a rapid increase in water discharge from the dam (flows increased from 800 cubic feet/second [cfs] to 3,400 cfs. Subsequent inspections revealed that the dam was structurally sound. This incident initiated a large-scale repair and replacement project of the dam's outlet works and emergency spillway.

In March 2016, a holding pond containing treated wastewater from the Yellowstone Club breached and spilled approximately 30 million gallons which eventually reached the South Fork West Fork of the Gallatin River. Data results from sampling that occurred immediately following the spill indicated that Montana health standards were not exceeded. Aquatic life standards were exceeded for ammonia and sediment. In spring of 2018, failures of two dams in Meagher County resulted in flows into Sixteenmile Creek in northern Gallatin County.

4.6.3 PROBABILITY

Several dams throughout the county are classified as high hazard; however, the probability of those dams breaking is considered low. High or significant hazard dams are the most probable to cause damages, and none are known to be unstable. The Montana DNRC keeps an assessment of dams not meeting safety standards.

4.6.4 MAPPING

Figure 4-4 provides mapping of inundation areas for breaches of the six high-hazard dams listed in Table 4-5; three of the dams (Green Hollow Creek, Hebgen, and Middle Creek) are located in Gallatin County, while the other three dams (Big Sky, Madison, and Willow Creek) are located in Madison County but have breach inundation areas that significantly affect Gallatin County. **Figure 4-5** shows a larger scale map of the inundation area for the Middle Creek (Hyalite) Dam during an overtopping flood event. Inundation mapping for breaches of all high-hazard dams is included in their Emergency Action Plans (EAPs).

4.6.5 ASSOCIATED HAZARDS AND OTHER FACTORS

Dam failure is most often associated with other hazards. Heavy rainfall or high-water levels from rapid snowmelt are typically a contributing factor in dam failure. In this scenario, flooding may already be occurring, in which case a dam failure would aggravate the situation. Dams have also failed as a result of significant earthquakes.

Dam failure resulting from a terrorist act is possible although unlikely due to the well-documented engineering principles and design standards that are required to ensure that dams can withstand a variety of unusual and extreme conditions in the natural environment. These rigorous design and construction processes produce inherently robust structures that cannot be easily exploited by terrorists.

4.6.6 VULNERABILITY

4.6.6.1 PROPERTY

There are a few critical facilities located within dam failure inundation areas in the county. During a failure, these facilities could be expected to be significantly impacted. Some roadways may become impassible, making travel to critical facilities more difficult.

Depending on the type of infrastructure, dam failure could result in long-term disruptions while new arrangements are made. According to the dam breach models, much of Belgrade, Four Corners, and significant portions of Interstate 90 and Highway 191 would be inundated and susceptible to significant damage following a breach of Middle Creek Dam. Furthermore, the airport would be inaccessible, and the railroad would be disconnected in several places. Interruptions in drinking water and utility services would be expected in some areas.

Failure of the Middle Creek Dam would have significant catastrophic effects on many residential structures within Gallatin County. Just over one hour after total failure a 35-foot high wave of water and debris is forecasted to reach the mouth of Hyalite Canyon. Fifty minutes later the water reaches Four Corners at depths ranging from 2.5 to over 8 feet.

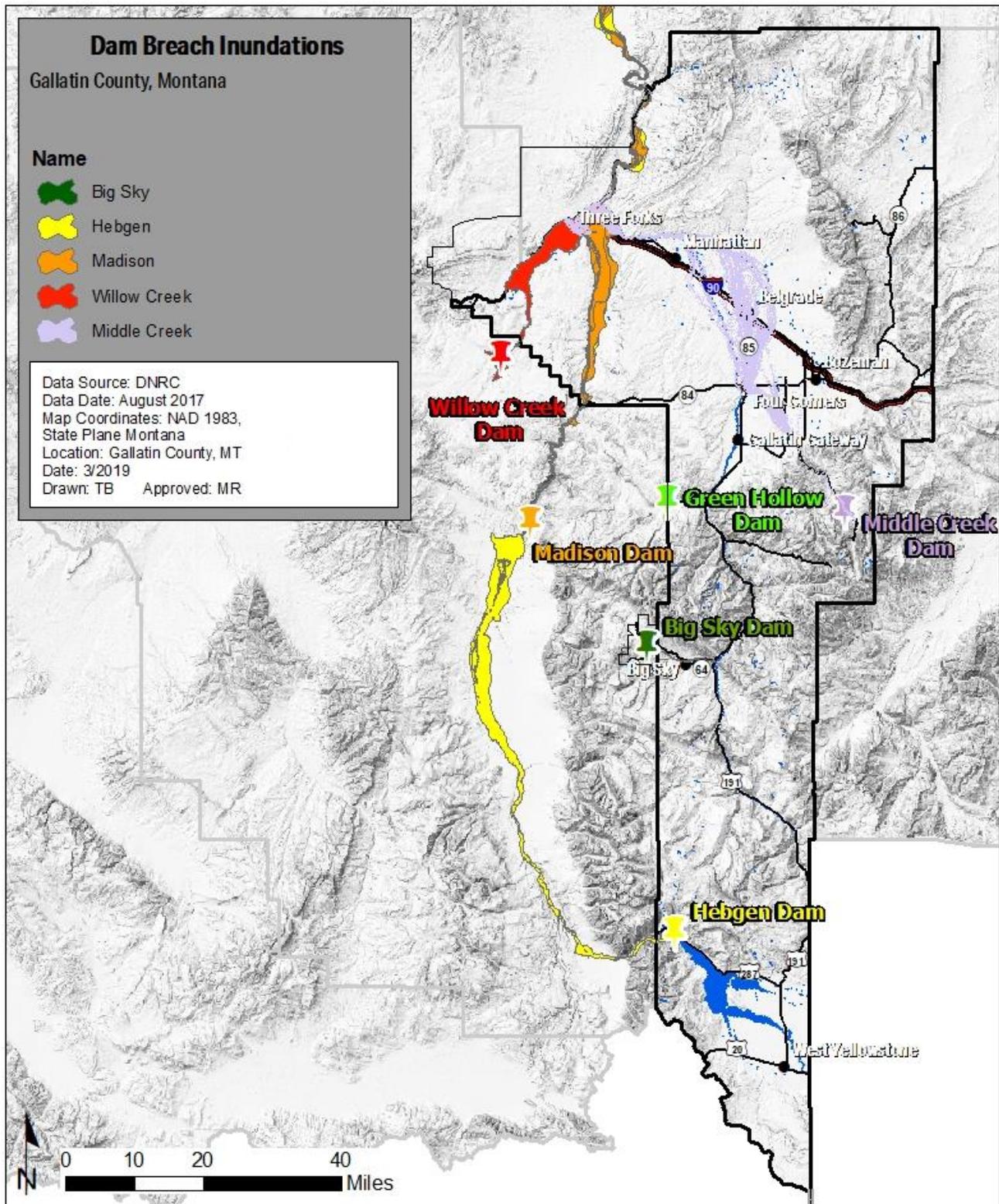


Figure 4-4. Map of breach inundation areas for High-Hazard Dams in, or affecting, Gallatin County.

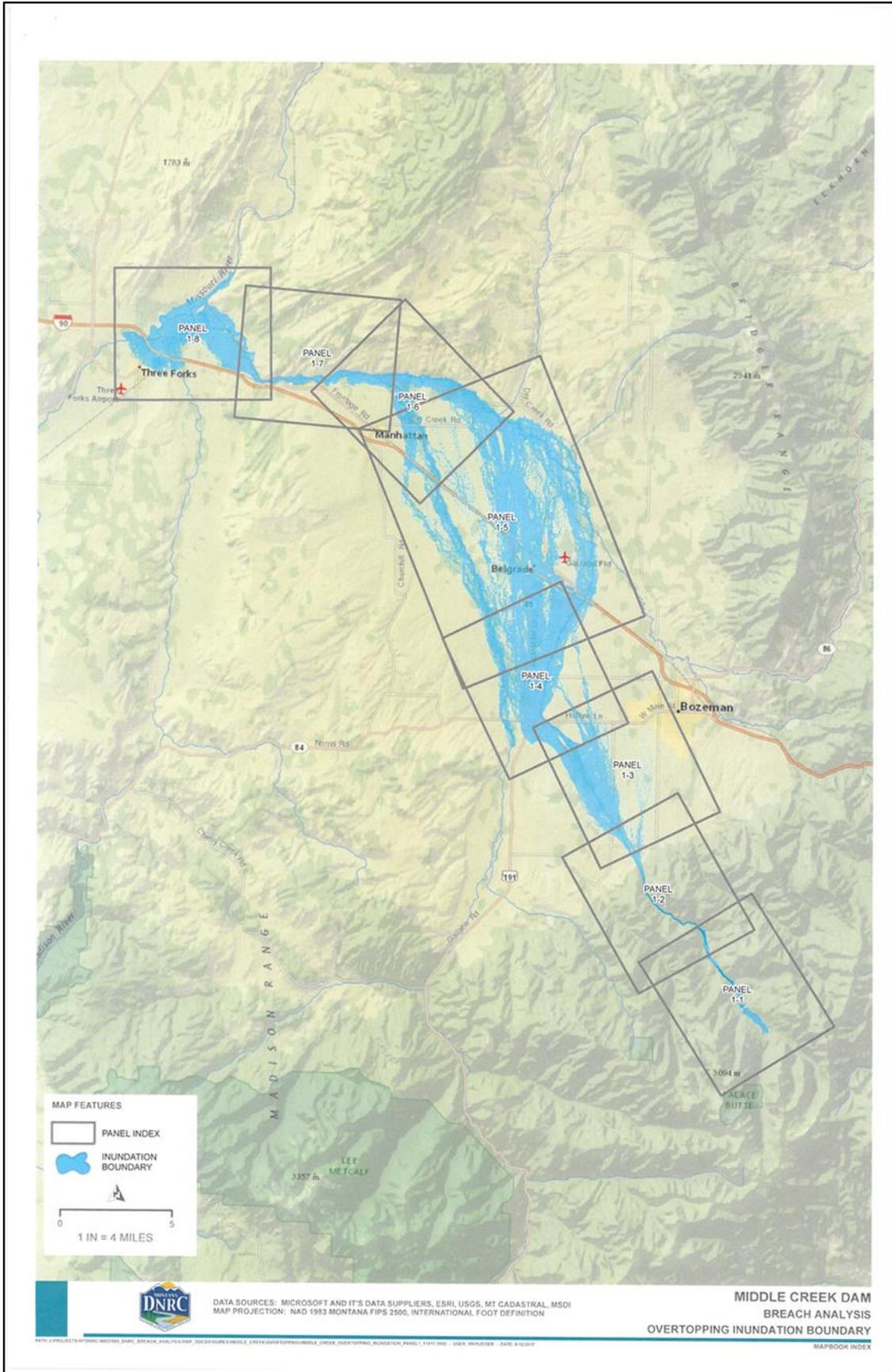


Figure 4-5. Middle Creek Dam Inundation Area – Overtopping Breach Analysis (HDR, DNRC, 2018)

Potential failures of the Hebgen or Madison Dams in Madison County, or the Willow Creek Dam in Gallatin County, would have a significant impact on the Three Forks area, with impacts potentially propagating further downstream into Broadwater County. These impacts could include disruption of highway traffic on I-90, and rail traffic in the Missouri Headwaters area north of I-90. The City of Three Forks could be entirely flooded and cutoff from access via surface roads and rail. Significant industries that could be affected include the Imerys talc plant in Three Forks and the GCC cement plant in Trident.

4.6.6.2 POPULATION

With any flooding or dam failure event, the loss of life is always possible. As with flash flooding, the warning time for a dam failure can be short, but some warning does exist. The Middle Creek Dam poses the greatest risk to lives in Gallatin County. This dam currently has an early warning system. Populations in Bozeman and West Yellowstone are less vulnerable than other jurisdictions due to lack of nearby dams.

4.6.6.3 ECONOMY

Significant economic impacts would be felt in the aftermath of a large dam failure, while a small dam failure would be expected to have only a minimal, localized impact. Business losses may occur due to damage to structures, property, and infrastructure. Additional losses could be incurred in the form of damaged agricultural land and reduced tourism and recreation. A dam failure would cause significant ecologic disruption in areas affected by the dam breach, which may include loss of habitat in some cases. Historic structures and contents may be damaged if located in the inundation area.

4.6.6.4 FUTURE DEVELOPMENT

Future development could place residences and business in the inundation areas. This is particularly true for development in Belgrade and Manhattan, as well as the Four Corners area, where land is currently largely rural and agricultural and is experiencing significant growth and development.

4.6.7 DATA LIMITATIONS

The data limitations related to dam failure include:

- / Lack of a loss ratio specific to dam failure, as many structures in the inundation area may experience little damage while others may be complete losses

4.6.8 OVERALL HAZARD PROFILE

District / Jurisdiction	Probability of Occurrence	Property Impact	Population Impact	Economic Impact	Overall Risk ¹ (Relative Score) (Range)
Gallatin County	Low	Moderate	Moderate	Moderate	Low (15) (13-39)
Belgrade	Low	Moderate	Moderate	Moderate	Low (12) (6-38)
Big Sky	Moderate	Low	Low	Moderate	Low (14) (7-52)
Bozeman	Low	High	High	Moderate	Moderate (17) (10-42)
Manhattan/Three Forks	Low	Moderate	Moderate	Moderate	Low (15) (6-37)
West Yellowstone	Low	Low	Low	Moderate	Low (7) (6-49)

¹ Each jurisdiction (district) determined the hazard's overall risk score by assigning values to ranking metrics that included: 1) probability that the hazard occurs, and 2) potential impacts to property, population and the economy. Criteria for assigning values to the probability and impact metrics and applying weighting factors to the different impact categories can be found in **Section 4.20, Risk Assessment Summary**.

The hazard risk scores for each jurisdiction were consolidated and then averaged to determine an overall risk score at the county level. The countywide risk scores were assigned a risk descriptor (Low, Moderate, High) based on their composite score ranking among all 19 identified hazards and by applying judgment to the final hazard rankings.

4.7 DROUGHT

“Drought is an insidious hazard of nature. Although it has scores of definitions, it originates from a deficiency of precipitation over an extended period, usually a season or more. This deficiency results in a water shortage for some activity, group, or environmental sector. Drought should be considered relative to long-term conditions that reflect a balance of precipitation and evapotranspiration in a particular area, a condition often perceived as ‘normal’ ” [Sivakumar and Wilhite, 2002].

Droughts can range from minor to severe, short-term to long-term with a variety of determining factors such as precipitation, soil moisture, and tree moisture. A minor, short-term drought can slip by unnoticed while a long-term severe drought can impact the agricultural economy, natural resources such as fish populations, and even public water supplies. In Montana, drought conditions have also been associated with grasshopper infestations and blight.

Montana is known for its arid climate and Gallatin County is no exception. The region has been in and out of droughts throughout history based on climate information, drought indices such as the Palmer Index, and drought monitoring at the national level. As of May 2019, Gallatin County was not in a drought. **Figure 4-6** shows the drought status of the United States on May 28, 2019. The State of Montana has a Drought Advisory Committee and a State Drought Plan in place to address this hazard. Historical weather records show that Bozeman temperatures can get as high as 106°F in the summer with extremely low humidity and high winds. Such dry, hot conditions exacerbate droughts during periods of low precipitation.

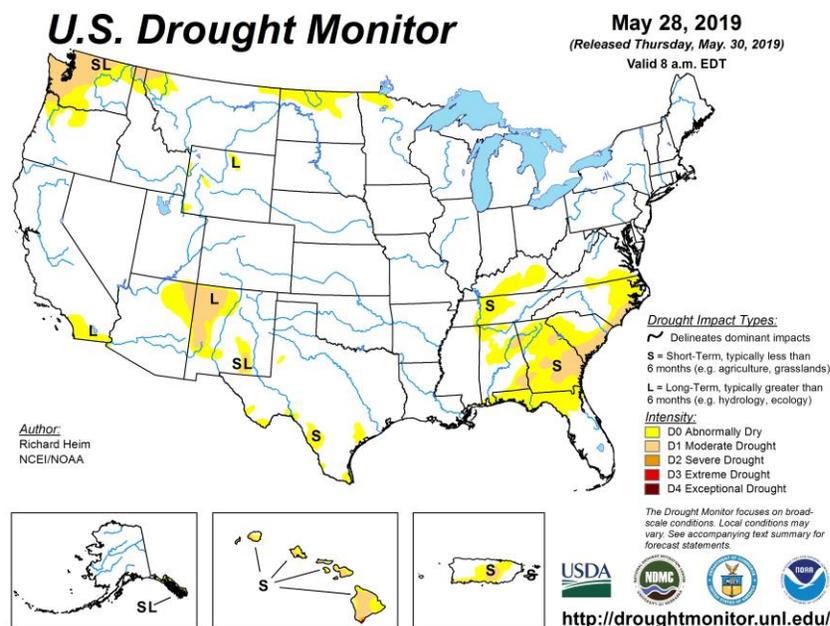


Figure 4-6. US Drought Monitor Map [US Drought Monitor, 2019]

4.7.1 HISTORY

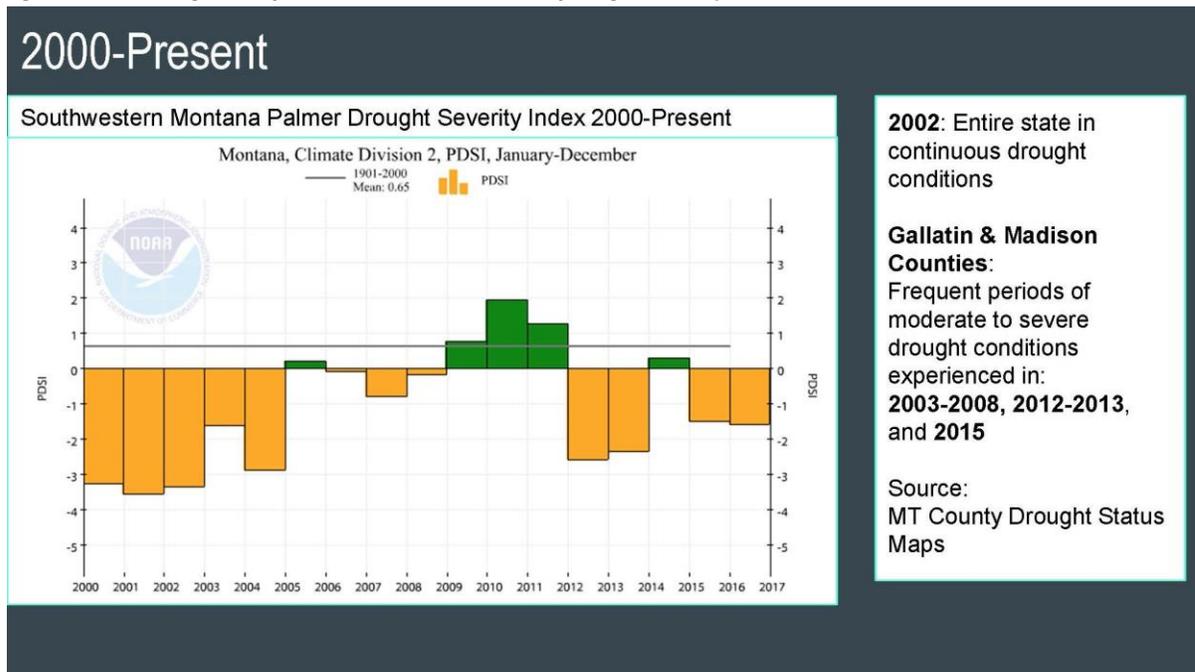
Drought has a long history in Gallatin County and all of Montana. Paleoclimate studies show extreme periods of drought hundreds of years ago. The periods of 200-370 A.D., 700-850 A.D., and 1000-1200 A.D. are identified as long-term periods of drought in the Northern Great Plains. With the development of a more detailed weather monitoring network, climate records generally date back 100 years in Montana.

Based on data from USDA and NOAA, Gallatin County has been in drought several times over the past decade. **Table 4-6** identifies and describes these periods. **Figure 4-7** shows the Palmer Drought Severity Index for the United States between 1895 and 1995.

Table 4-6. Gallatin County Drought Periods since 1900 [National Oceanic & Atmospheric Administration (NOAA), 2018]

Time Period	Description
1930's	The Dust Bowl created erosion problems and dust storms throughout the state.
Mid 1950's	Extended period of reduced rainfall in Eastern and Central Montana.
1960's	Entire state affected, although the impact of this drought was lessened through better conservation practices such as strip cropping.
1970's	By May 1977, over 250,000 acres of Montana farmland was damaged by wind. The State of Montana began taking protective measures due to critically low hydroelectric power supplies.
1985	USDA drought disaster declaration. A typical 2,500-acre farm lost more than \$100,000 in equity. The state agriculture industry lost nearly \$3 billion in equity.
2000's	Statewide drought disaster designations in 2000, 2001, and 2002. In 2004, Gallatin County was given a USDA Secretarial Disaster Designation. Most protective measures were conducted at the county level.
2010's	Gallatin County received a USDA Secretarial Disaster Designation for drought in 2012 through 2017.

Figure 4-7. Palmer Drought Severity Index (2000-2017) [Montana County Drought Status Maps, 2018]



4.7.2 PROBABILITY

The National Oceanic and Atmospheric Administration Paleoclimatology Program studies drought by analyzing records from tree rings, lake and dune sediments, archaeological remains, historical documents, and other environmental indicators to obtain a broader picture of the frequency of droughts in the United States. According to their research, "...paleoclimatic data suggest that droughts as severe as the 1950's drought have occurred in central North America several times a century over the past 300-400 years, and thus we should expect (and plan for) similar droughts in the future. The paleoclimatic record also indicates that droughts of a much greater duration than any in the 20th century have occurred in parts of North America as recently as 500 years ago." (National Climatic Data Center, Paleoclimatology Branch, <http://www.ngdc.noaa.gov/paleo/paleo.html>). Based on this research, the 1950s drought situation could be expected approximately once every 50 years, or a 20% chance, every 10 years. An extreme

drought, worse than the 1930s Dust Bowl, has an approximate probability of occurring once every 500 years or a 2% chance of occurring each decade. It should be noted the probability of a major disaster in Big Sky and West Yellowstone is somewhat reduced, as the communities have little to no agriculture and thus significantly reduced water needs.

4.7.3 MAPPING

Drought is regional hazard, and therefore, mapping at the county level is not appropriate here. The risk is assumed to be the same countywide. Mapping of current drought status is published by the US Drought Monitor weekly and the Montana Drought Advisory Committee monthly from March through October.

4.7.4 ASSOCIATED HAZARDS AND OTHER FACTORS

Drought is most commonly associated with wildfire in Gallatin County. Dry conditions contribute to lower moisture content in the trees and plants that provide fuel for wildfires. An initial look at the driest years show that they do not directly coincide with severe wildfire seasons, however, the effects of drought can carry into the long term. One season of severely low precipitation may not be enough for extreme fire behavior; however, followed by several seasons of below normal precipitation, the conditions can contribute to an increased probability for significant wildfires. Drought often kills trees and plants that then become very dry fuels for wildfires years later. Short-term drought conditions can prime grasses on non-irrigated lands for grass fires and long-term drought conditions can additionally impact the heavier timber fuels for forest fires.

Counterintuitively, in mountainous areas, such as those found in Gallatin County, drought can quickly be followed by flash flooding. Dry soils are not as permeable to water, particularly if the vegetation has been killed, and therefore, heavy rains run off faster than on moist soils with green vegetation and can more easily lead to flash flooding.

Impacts to water supplies for both irrigation of crops and potable domestic use can be severe during periods of drought. In extreme cases, water may not be available for agricultural uses as determined by water right priority and/or physical availability. Municipal or other local water suppliers may need to ration potable water available for domestic uses.

Blight and grasshopper infestations have a greater probability of occurring in drought conditions. Besides the hydrologic and agricultural impacts, drought can lead to severe dust storms and soil erosion affecting populations in non-agriculture settings. Other concerns include water temperatures for fish populations, wildlife health, plant ecology changes, hydroelectric power supplies, and public water sources.

4.7.5 VULNERABILITY

4.7.5.1 PROPERTY

Generally, critical facilities are not affected directly by drought. Infrastructure relying on the water supply is the primary exception. If the water supply for public drinking water and sewer systems was threatened, those losses could total millions of dollars should equipment be damaged or outside water need to be shipped into the county. The probability of a drought of that significance is considered low.

The most probable losses from drought are to the economy. Drought significantly impacts the agricultural economy and can additionally impact tourism. Gallatin County totaled over \$91.8 million in crop sales in

2015 [MT Dept. of Agriculture/USDA, 2017]. Crops are directly affected by drought and this economy could potentially be lost if drought conditions persist for a period of time.

Crops aren't the only aspect of agriculture affected by drought. Livestock can also be impacted. The pasture and food supply available to the animals is directly related to drought conditions. With over \$48 million in livestock sales in 2015 (MT Dept. of Agriculture/USDA, 2017), this represents a substantial portion of the overall agricultural economy that is threatened by drought.

Natural resources, and therefore tourism, are influenced by drought as well. As river and stream levels drop, fish populations and other natural resources are impacted. With fishing and river recreational activities a very important part of the tourism industry in Gallatin County, those aspects of the economy can be threatened during extended periods of drought.

4.7.5.2 POPULATION

Since drought evolves slowly over time, the population has ample time to prepare for its effects and is warned accordingly. The greatest direct threat to the population from drought is through the drinking water supply. Should a drought affect the water available for public water systems or individual wells, the availability of clean drinking water could be compromised. This situation would require emergency actions and could possibly overwhelm the local government and financial resources. The more urbanized areas such as Bozeman and Belgrade are at increased risk, due to concentrated water demand.

4.7.5.3 ECONOMY

Agriculture is a significant part of the Gallatin County economy and culture. Drought severely threatens the agriculture industry when it causes a loss of forage, feed, or water supplies. These losses often impact other industries, such as farm supply and transportation services, which depend on local agriculture.

The economy can be further impacted by drought through reduced tourism. As drought reduces natural water supplies, fish populations and other natural resources are impacted, which play a large part in drawing tourists and recreationalists to the area.

4.7.5.4 IMPACT OF FUTURE DEVELOPMENT

Future development's greatest impact on the drought hazard would be through possibly limiting ground water resources. Fortunately, public systems, individual wells, and septic systems are carefully monitored and regulated by Montana Department of Environmental Quality. Therefore, the impact of future development with respect to drought is considered low.

4.7.6 DATA LIMITATIONS

The greatest data limitation with drought is the inability to pinpoint the start and end of drought periods and the associated correlation with economic losses. An online database of historical USDA drought declarations and the associated losses would prove beneficial in documenting the effects of drought and directing mitigation activities.

4.7.7 OVERALL HAZARD PROFILE

District / Jurisdiction	Probability of Occurrence	Property Impact	Population Impact	Economic Impact	Overall Risk ¹ (Relative Score) (Range)
Gallatin County	High	Moderate	Moderate	Moderate	High (34) (13-39)
Belgrade	High	Moderate	High	Moderate	High (38) (6-38)
Big Sky	Moderate	Moderate	Moderate	Moderate	Moderate (29) (7-52)
Bozeman	High	Moderate	High	Moderate	High (42) (10-42)

District / Jurisdiction	Probability of Occurrence	Property Impact	Population Impact	Economic Impact	Overall Risk ¹ (Relative Score) (Range)
Manhattan/Three Forks	High	Moderate	Moderate	Moderate	High (37) (6-37)
West Yellowstone	Moderate	Low	Moderate	Moderate	Moderate (19) (6-49)

¹ Each jurisdiction (district) determined the hazard's overall risk score by assigning values to ranking metrics that included: 1) probability that the hazard occurs, and 2) potential impacts to property, population and the economy. Criteria for assigning values to the probability and impact metrics and applying weighting factors to the different impact categories can be found in **Section 4.20, Risk Assessment Summary**.

The hazard risk scores for each jurisdiction were consolidated and then averaged to determine an overall risk score at the county level. The countywide risk scores were assigned a risk descriptor (Low, Moderate, High) based on their composite score ranking among all 19 identified hazards and by applying judgment to the final hazard rankings.

4.8 EARTHQUAKE

4.8.1 DESCRIPTION

One of the most frightening and destructive phenomena of nature is a severe earthquake and its terrible aftereffects. An earthquake is a sudden movement of the Earth, caused by the abrupt release of strain that has accumulated over a long time. For hundreds of millions of years, the forces of plate tectonics have shaped the Earth as the huge plates that form the Earth's surface slowly move over, under, and past each other. Sometimes the movement is gradual. At other times, the plates are locked together, unable to release accumulating energy. When the accumulated energy grows strong enough, the plates break free. Montana is ranked fourth in the United States for seismicity and has many faults, primarily in the mountainous parts of the state. Yellowstone National Park, within and to the south of Gallatin County, is an active geothermal area with approximately 2,000 earthquakes each year. Gallatin County lies in the middle of the most active areas and has experienced significant earthquakes over the last century. Earthquakes can damage property and infrastructure very rapidly and significantly with little warning, severely impacting those close to the epicenter and being felt for hundreds of miles.

4.8.2 HISTORY

Since 1900, 17 earthquakes of magnitude 5.5 or greater have occurred within 100 miles of Gallatin County, as shown in **Table 4-7**, although several of these events can be considered foreshocks or aftershocks to a single main earthquake (e.g., the Hebgen Lake earthquakes that occurred on August 18-19, 1959). The closest earthquakes to southern Gallatin County were the Hebgen Lake and Yellowstone Park earthquakes, and to northern Gallatin County, the Clarkston and Lombard earthquakes.

Table 4-7. Earthquakes Magnitude 5.5 or greater within 100 miles of Gallatin County, Montana [US Geological Survey (USGS), 2017]

Date	Approximate Location	Magnitude
7/06/2017	Lincoln	5.8
7/25/2005	Dillon	5.6
12/8/1976	Yellowstone, Gallatin Co.	5.5
6/30/1975	Yellowstone, Gallatin Co.	5.9
10/21/1964	Hebgen Lake	5.6
8/19/1959	Hebgen Lake	6.0
8/18/1959	Hebgen Lake	7.5
8/18/1959	Hebgen Lake	6.5
8/18/1959	Hebgen Lake	6.0

Date	Approximate Location	Magnitude
8/18/1959	Hebgen Lake	5.6
8/18/1959	Hebgen Lake	6.3
11/23/1947	Virginia City	6.1
10/31/1935	Helena	6.0
10/19/1935	Helena	6.3
10/12/1935	Helena	5.9
2/16/1929	Lombard	5.6
6/28/1925	Clarkston	6.6

The Clarkston earthquake caused relatively light damages due to the rural nature of the area at that time. Most of the damages were confined to Manhattan, Logan, Three Forks, and Lombard in Gallatin and Broadwater Counties. The earthquake was felt from the North Dakota line to Washington and from the Canadian border to central Wyoming. Un-reinforced brick structures suffered the greatest damages. Bozeman felt five distinct shocks. Pavement and buildings sustained cracks up to an inch wide. Mines in Jardine in neighboring Park County were feared to have been damaged. Bozeman police reported the tower of a high building swaying with many people fainting and rushing to the streets. A train from Livingston was sent to rescue passengers from trains trapped by landslides near Lombard. In Clyde Park in Park County, the stock of tinware at Jack O'Leary's store fell off the shelves.



Three Forks church, following 6.6 magnitude Clarkston earthquake, June 1925. Photo by J.T. Pardee (courtesy USGS).

The initial Hebgen Lake earthquake on August 18, 1959 is the most significant earthquake to have occurred in the region over the past 100 years. This magnitude 7.5 earthquake occurred about 30 miles from Gardiner and about 70 miles from Bozeman. This surface rupturing earthquake changed the geology of the Hebgen Lake area and triggered a major landslide (80 million tons of rock). The result was the creation of a new lake, Earthquake Lake, on the Madison River and State Highway 287 was buried. Twenty-eight people perished and roadway and timber damages totaled over \$11 million. The quake was felt in 8 states and 3 Canadian provinces [USGS, 1976]. The North Entrance to Yellowstone National Park did have some landslides blocking roadways, but all were cleared within 2 days. Also damaged was the Golden Gate above Mammoth Hot Springs near Gallatin County. Estimated damages in the Park were about \$2 million.



1959 Hebgen Lake earthquake. Photo courtesy USGS, Idaho (Hadley, J.B.)

4.8.3 PROBABILITY

Large and damaging earthquakes are infrequent events. Gallatin County experiences many small earthquakes every month, but they are not detectable by humans and only by instrumentation. The geography of Gallatin County is such that it lies within several categories of seismic source zones. The most active is the Northern Intermountain Seismic Belt to the north and west. This region is estimated to have a recurrence rate of 3.84 years for a magnitude 5 or greater earthquake, 22.6 years for a magnitude 6 or greater earthquake, and 133 years for a magnitude 7 or greater earthquake [Wong et. al., 2005].

4.8.4 MAPPING

Research through the USGS National Seismic Hazard Mapping Project has resulted in peak ground acceleration (PGA) maps related to the probability of seismic shaking. The map for Gallatin County (**Figure 4-88**) shows the strength of seismic shaking that has a 2% probability of being exceeded in a 50-year period. The strength of shaking is measured as a percentage of the acceleration of gravity (%g). Generally, a PGA of above 20%g would result in major damage. As **Figure 4-88** shows, the entire county is at risk of experiencing an earthquake resulting in major damage, though the area surrounding West Yellowstone is particularly at risk.

History has shown that significant earthquakes (up to magnitude 6.5) may occur anywhere throughout the Intermountain Seismic Belt, even in areas where young faults are not recognized. Examples of damaging earthquakes for which no known surface fault was recognized include the 1925 Clarkston earthquake (magnitude 6.6) and the 1935 Helena earthquakes (magnitude 5.9-6.3).

4.8.5 ASSOCIATED HAZARDS AND OTHER FACTORS

The seismic action of earthquakes often triggers other events. Landslides are quite common in Montana with large earthquakes. During the winter, avalanches can also be triggered. Dam breaks and landslides on waterways may cause flooding. The rupture of gas lines can result in large-scale urban fires, particularly if power outages or broken water mains disrupt water supplies. Any number of additional incidents may occur due to the failure of infrastructure such as hazardous material spills and large-scale transportation accidents. All these associated factors contribute to the severity of the earthquake event.

4.8.6 VULNERABILITY

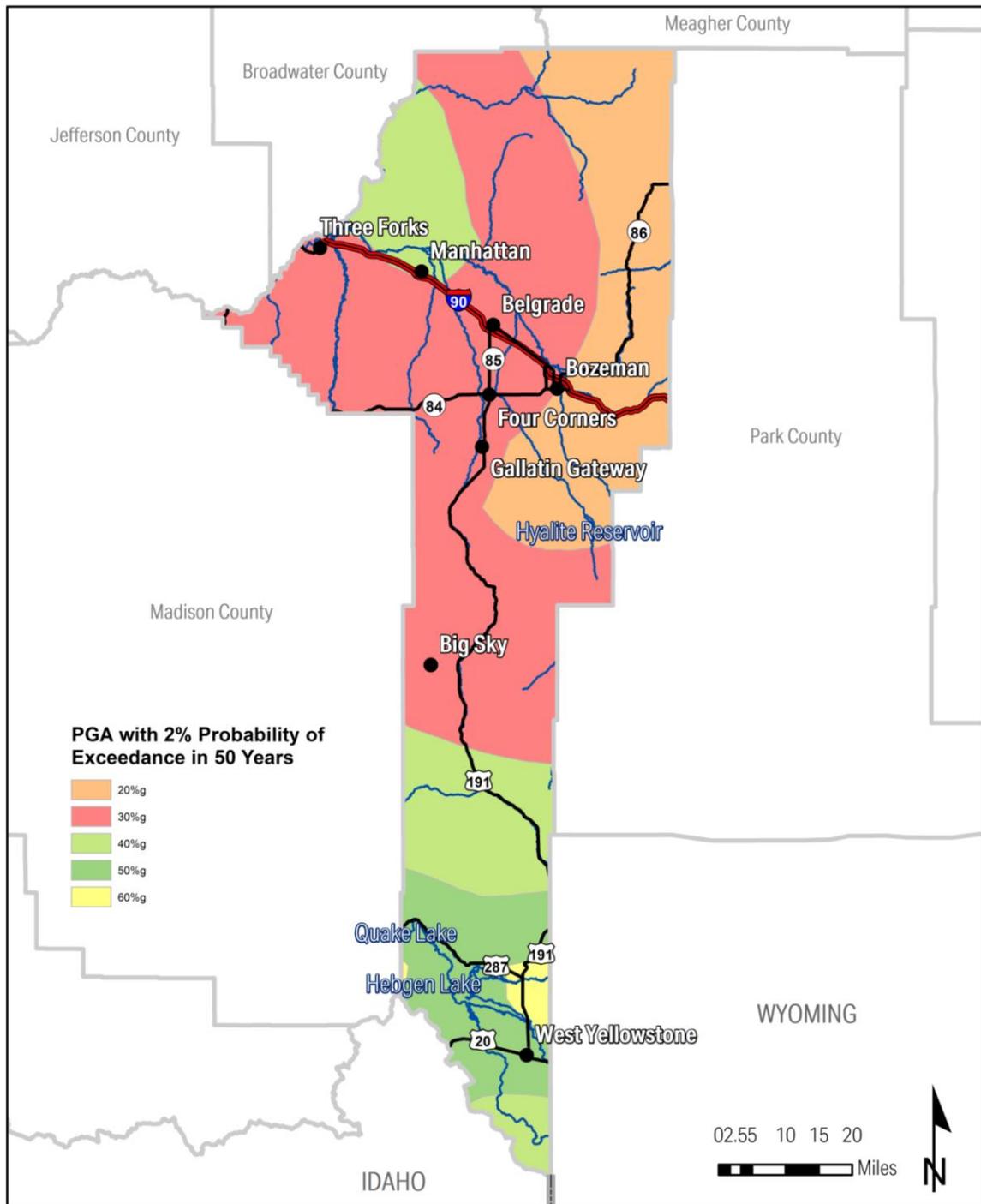
4.8.6.1 PROPERTY

Since the probability and likely strength of an earthquake varies across the county, the threat to critical facilities can be assessed based on their respective geographic locations. Structural assessments of the individual facilities would further determine the seismic stability of that structure. Based on geography, the critical facilities near the fault lines can be considered the most vulnerable. All critical facilities are at risk from earthquakes in Gallatin County. In addition, un-reinforced masonry construction is particularly vulnerable to seismic shaking. Therefore, any critical facilities with, or within close proximity to un-reinforced masonry can be considered at greatest risk.

Two HAZUS-MH earthquake models were used to estimate the extent of damage caused by an earthquake in Gallatin County. The first scenario considered a magnitude 6.5 earthquake on the Bridger Fault, which runs along the base of the Bridger Mountains. The second scenario considered a magnitude 7.5 earthquake on the Madison Fault, which is located west of Hebgen Lake. The difference in earthquake magnitudes modeled (6.5 and 7.5) reflects the mapped differences in PGA that could result from an earthquake having a 2% exceedance probability in a 50-year period on each of the faults (30%g on the Bridger Fault and 50%g on the Madison Fault, **Figure 4-8**). Based on the HAZUS-MH run results, **Table 4-8** shows the functionality of critical facilities included in the inventory following an earthquake event.

Earthquake Hazard

Gallatin County, Montana



Data Source: Montana NRIS, USGS
 Data Date: August 2017
 Mapp Coordinates: NAD 1983, State Plane Montana

Figure 4-8. Earthquake Hazard in Gallatin County

These results highlight how a larger earthquake (a magnitude 7.5 earthquake is 10 times larger than a magnitude 6.5 earthquake, *however* it is nearly 32 times stronger in energy release, USGS - https://earthquake.usgs.gov/learn/topics/how_much_bigger.php) does not necessarily result in greater impacts to critical facilities (structures) due to the considerable difference in distance of the two faults from population centers in Gallatin County. Nonetheless, an earthquake occurring on the Madison Fault would be expected to have substantially greater impacts in the southern portion of the county (West Yellowstone area) versus the more populated Gallatin Valley simply due to its closer proximity to the fault.

Table 4-8. Critical Facility Functionality¹ Following an Earthquake

Critical Facility Type	6.5 Earthquake – Bridger Fault	7.5 Earthquake – Madison Fault
Hospital	64% on Day 1	93% on Day 1
	90% on Day 7	98% on Day 7
	99% on Day 90	99% on Day 90
Fire Stations	82% on Day 1	84% on Day 1
Law Enforcement Stations	70% on Day 1	81% on Day 1
Schools	73% (avg.) on Day 1	86% (avg.) on Day 1
	Range: 37-99%	Range: 51-99%

¹ In this table functionality is defined as a percentage of full (100%) functionality of the facility at the specified time interval (number of days) following the earthquake event. Day 1 is considered the same day that the earthquake occurs.

The HAZUS-MH 4.2 database for Gallatin County includes infrastructure assets (highways, bridges, airports, pipelines, etc.) valued at over \$2.7 billion. The estimated infrastructure losses that would occur for the modeled earthquake scenarios are shown in **Table 4-9**.

Table 4-9. Estimated Infrastructure Losses Following an Earthquake (6.5 magnitude Bridger Fault, 7.5 magnitude Madison Fault)

Infrastructure System	Bridger Fault Economic Losses	Bridger Fault Damages	Madison Fault Economic Losses	Madison Fault Damages
Highway	\$2,847,000		\$1,461,000	
Bus	\$3,500		\$214,000	
Airport	\$7,480,000		\$5,160,000	
Potable Water	\$6,121,000	849 leaks 212 breaks 600 households without service on Day 1	\$1,550,000	284 leaks 71 breaks 6 households without service on Day 1
Wastewater	\$37,805,000	426 leaks 107 breaks	\$8,213,000	143 leaks 36 breaks
Natural Gas	\$657,000	146 leaks 37 breaks	\$220,000	49 leaks 12 breaks
Total	\$54,913,500		\$16,818,000	

Many structures, including critical facilities, within Gallatin County have not been seismically assessed. Depending on the construction, those homes, businesses, and critical facilities may not be structured to withstand seismic shaking. Downtown Bozeman also has many non-reinforced, masonry buildings that house businesses. Estimates of building damages generated by HAZUS-MH are outlined in **Table 4-10** and **Table 4-11**.

Table 4-10. Expected Building Damage by Occupancy during 6.5 Magnitude Earthquake on Bridger Fault

Type	Slight Damage	Moderate	Extensive	Complete
Agriculture	63	41	15	6
Commercial	518	440	179	66
Industrial	167	156	67	25
Other Residential	1,397	1,315	680	188
Religion	42	28	10	3
Single Family	7,198	1,834	115	27
Total	9,385	3,814	1,066	315

Table 4-11. Expected Building Damage by Occupancy during 7.5 Magnitude Earthquake on Madison Fault

Type	Slight Damage	Moderate	Extensive	Complete
Agriculture	30	13	2	1
Commercial	274	135	28	3
Industrial	94	50	10	1
Other Residential	920	537	87	6
Religion	21	9	2	1
Single Family	2,600	266	8	2
Total	3,939	1,010	137	14

4.8.6.2 POPULATION

The population would have little or, most likely, no warning prior to an earthquake. Most casualties in a large earthquake in Gallatin County would be anticipated with building collapse, roadway failures, falling objects, and landslides. The number of actual casualties will be dependent on a variety of factors including proximity to the epicenter, time of day, and magnitude, among others. The HAZUS-MH runs estimate up to 340 people injured and 20 casualties in the magnitude 6.5 earthquake event on Bridger Fault depending on time of day, and up to 30 people injured and 5 casualties in a magnitude 7.5 earthquake event on Madison Fault.

4.8.6.3 ECONOMY

The impacts of a strong earthquake in Gallatin County could be far reaching. Economic, physical and functional damages to businesses, particularly downtown businesses in non-reinforced masonry structures, could be substantial. Industries such as construction, however, may see a recovery related boom following an earthquake. The HAZUS-MH runs estimate the losses from capital stock, including inventory, lost wages, and lost rental income would total \$584,560,000 after a magnitude 6.5 earthquake along the Bridger fault, and \$105,490,000 after a magnitude 7.5 earthquake along the Madison fault.

4.8.6.4 FUTURE DEVELOPMENT

Any future development in Gallatin County is at risk for earthquake damages. Fortunately, construction standards for seismic stability have improved over the past 100 years. Bozeman, Belgrade, Manhattan, Three Forks, and West Yellowstone are the only jurisdictions within Gallatin County that have a building code and inspection program. Other areas of the county are under the state building code that for most single-family homes is only subject to electrical, plumbing, and septic inspections. Much of the new Gallatin County construction is taking place in the areas near the identified and active faults. Should an earthquake occur on these faults, the future development that occurs will be in the highest hazard area.

4.8.7 DATA LIMITATIONS

Since earthquakes are a relatively rare event, perhaps the greatest challenge is understanding the true probability and damages possible. More research is needed to identify fault areas and develop digital data for use in the HAZUS-MH modules. Improving the modeling and assessing individual facilities will allow for a more accurate vulnerability assessment.

4.8.8 OVERALL HAZARD PROFILE

District / Jurisdiction	Probability of Occurrence	Property Impact	Population Impact	Economic Impact	Overall Risk ¹ (Relative Score) (Range)
Gallatin County	Moderate	Moderate	High	Moderate	High (32) (13-39)
Belgrade	Moderate	High	High	High	High (33) (6-38)
Big Sky	Moderate	Moderate	Moderate	Moderate	Moderate (28) (7-52)
Bozeman	Moderate	High	High	High	High (34) (10-42)
Manhattan/Three Forks	Moderate	Moderate	High	Moderate	Moderate (28) (6-37)
West Yellowstone	High	High	High	High	High (48) (6-49)

¹ Each jurisdiction (district) determined the hazard's overall risk score by assigning values to ranking metrics that included: 1) probability that the hazard occurs, and 2) potential impacts to property, population and the economy. Criteria for assigning values to the probability and impact metrics and applying weighting factors to the different impact categories can be found in **Section 4.20, Risk Assessment Summary**.

The hazard risk scores for each jurisdiction were consolidated and then averaged to determine an overall risk score at the county level. The countywide risk scores were assigned a risk descriptor (Low, Moderate, High) based on their composite score ranking among all 19 identified hazards and by applying judgment to the final hazard rankings.

4.9 ENVIRONMENTAL HAZARDS

4.9.1 DESCRIPTION

As it relates to this plan, an environmental hazard can be classified as any substance which once released to or from the natural environment has the potential to adversely impact human health. The hazard can be human-caused, as in the case where raw sewage from a damaged septic system contaminates groundwater, or occur as part of a natural process, such as when wildfires reduce ambient air quality.

4.9.2 HISTORY

Increased incidences of large wildfires across the western U.S. over the last 20 years has resulted in an increased frequency of poor air quality days in Gallatin County. The effects of wildfire smoke on air quality tend to occur during the peak wildfire season of July – October.

Another phenomenon that significantly affected air quality across the county was the 1980 volcanic eruption of Mount St. Helens in Washington. Up to 1 cm of ash fell over portions of the county.

4.9.3 PROBABILITY AND MAGNITUDE

The probability of an environmental hazard occurring is difficult to quantify, however one can occur almost anywhere at any time. Similarly, the magnitude and intensity of an environmental hazard will largely be driven by the scale of the event that caused the hazard. For example, a small wildfire could cause poor air quality for a short duration over a relatively small area. Conversely, a massive wildfire or volcanic eruption may cause widespread air quality impacts that affect the entire county and beyond.



NASA satellite image from September 3, 2017 showing smoke across western Montana and much of the country.



Screenshot from NOAA satellite video, September 3, 2017. Smoke affecting air quality across all of Gallatin County.

4.9.4 MAPPING

Environmental hazards can occur anywhere humans are able to interact with the environment. Thus, the potential is considered present throughout the entire county.

4.9.5 ASSOCIATED HAZARDS AND OTHER FACTORS

Environmental hazards can occur as a result of almost any hazard imaginable. Earthquakes or severe weather may cause infrastructure to fail, which releases contamination into the environment. A wildfire or volcano could contaminate air or water resources. Similarly, an aviation, ground transportation, or railroad accident could cause a hazardous materials release which poses an environmental hazard.

4.9.6 VULNERABILITY

4.9.6.1 PROPERTY

Critical facilities and infrastructure are not expected to be physically impacted by environmental hazards, though the functionality could certainly be impacted. Erosion following a wildfire can result in large sediment loads in drinking water sources, which could quickly overwhelm the ability of drinking water treatment plants to treat the water to meet drinking water standards.

4.9.6.2 POPULATION

The general population can be easily and almost entirely affected by poor air quality due to its necessity for life function. Large portions of the population can also be affected by poor water quality, particularly if large-scale water distribution systems are impacted.

4.9.6.3 ECONOMY

Poor air and water quality can affect almost all commercial activities, potentially having a substantial economic impact.

4.9.6.4 FUTURE DEVELOPMENT

Future development can be impacted by impacts to air and water quality.

4.9.7 DATA LIMITATIONS

Data limitations include a lack of historical data, and inability to track environmental hazards such as a septic contamination.

4.9.8 OVERALL HAZARD PROFILE

District / Jurisdiction	Probability of Occurrence	Property Impact	Population Impact	Economic Impact	Overall Risk ¹ (Relative Score) (Range)
Gallatin County	Moderate	Moderate	Moderate	Moderate	Moderate (26) (13-39)
Belgrade	High	Moderate	Moderate	Moderate	High (33) (6-38)
Big Sky	Moderate	Moderate	Moderate	Moderate	Moderate (21) (7-52)
Bozeman	High	Moderate	High	Moderate	High (34) (10-42)
Manhattan/Three Forks	High	Moderate	Moderate	Moderate	Moderate (28) (6-37)
West Yellowstone	Moderate	Moderate	Moderate	Moderate	Moderate (20) (6-49)

¹ Each jurisdiction (district) determined the hazard's overall risk score by assigning values to ranking metrics that included: 1) probability that the hazard occurs, and 2) potential impacts to property, population and the economy. Criteria for assigning values to the probability and impact metrics and applying weighting factors to the different impact categories can be found in **Section 4.20, Risk Assessment Summary**.

The hazard risk scores for each jurisdiction were consolidated and then averaged to determine an overall risk score at the county level. The countywide risk scores were assigned a risk descriptor (Low, Moderate, High) based on their composite score ranking among all 19 identified hazards and by applying judgment to the final hazard rankings.

4.10 FLOODING

4.10.1 DESCRIPTION

Flooding is the inundation of a normally dry area with water. Riverine flooding occurs on rivers, creeks, and streams as water levels rise be it from excessive precipitation, rapid snowmelt, dam failure, or ice jams. Unlike riverine flooding, flash flooding can happen anywhere. As the name implies, flash flooding happens quickly after intense rains, dam or ice jam breaks, or rapid runoff in mountainous or recently burned areas. Urban flooding is the result of development and the ground's decreased ability to absorb the rainfall. Flooding from groundwater does not typically result in floodwaters at the surface, but occasionally basements and crawlspaces can be flooded by excessive groundwater.

Flooding in Gallatin County normally occurs during periods of excessive rainfall or snowmelt. The mountainous terrain in Gallatin County is a contributing factor to rapid flood development and snowmelt problems. The most recent, widespread flooding event across the county occurred in 2011. Since then there has been a steady increase in the amount of development near streams and rivers. Associated with this development are concerns for public health and safety when the next flooding event occurs.

4.10.1.1 FLOODPLAIN MANAGEMENT

The Montana Floodplain and Floodway Management Act [Montana Code Annotated, Title 76, Chapter 5] requires political subdivisions to adopt land use regulations that regulate the use and development of property within the regulated floodways and floodplains. Gallatin County Floodplain Regulations were first adopted in 1984 and most recently updated in December 2017. The regulations are administered through the Gallatin County Planning Department.

Within the City of Bozeman, FEMA designated floodplains and floodways are managed by the City's Floodplain Administrator within the Engineering Dept. The City's Unified Development Code (UDO),

Chapter 38, Division 38.600, provides guidance on administration of the Floodplain Regulations and provides land use and permitting requirements.

The City of Three Forks also manages floodplains within its jurisdiction. The City's Flood Damage Prevention Ordinance provides direction on floodplain management and permitting requirements.

Riverine flooding problems are managed through a national insurance system called the National Flood Insurance Program (NFIP) administered by FEMA. Gallatin County and the Cities of Bozeman, Belgrade, and Three Forks, as well as the Town of Manhattan are all NFIP participants. FEMA conducts a Flood Insurance Study (FIS) of a region to identify the community's risk levels. The FIS includes statistical data for river flow, rainfall, topographic surveys, as well as hydrologic and hydraulic analyses. After examining the FIS data, FEMA creates Flood Insurance Rate Maps (FIRMs) delineating the different areas of flood risk. Land areas that are at high risk for flooding are called Special Flood Hazard Areas (SFHAs), or floodplains. These maps are certainly not all inclusive and other flood prone areas may exist. The FIRM maps in Gallatin County were recently digitized and the new digital FIRMs went into effect on September 2, 2011.

In 2012, FEMA, DNRC, and Gallatin County began a floodplain mapping update project for the West Gallatin River and Bozeman Creek and its tributaries to more accurately model these areas and show flood risks. The project's draft floodplain maps will eventually replace existing floodplain maps for the West Gallatin River, Bozeman Creek, Mathew Bird Creek, Nash Spring Creek, Flat Creek, Figgins Creek and the Mill Ditch Diversion. The project utilized high-accuracy topographic information, updated hydrologic data and modern engineering methods to ensure the communities have the best available data. Technical data for the West Gallatin and Bozeman Creek and tributaries floodplain mapping project is available for download on the [City of Bozeman's file share site](#). Data including hydrologic analyses, flood profiles, floodway data tables, and HEC-RAS modeling files are available. New FIRM maps from this project are expected to be finalized in late 2019 after a technical and public review process.

Residents of Gallatin County, Bozeman, Belgrade, Three Forks, or Manhattan have the option to purchase flood insurance through the NFIP. As of February 2018, there are 172 policies in force covering over \$47 million in property in unincorporated areas of Gallatin County. The City of Bozeman has 99 policies in force, covering over \$24 million in property. The City of Three Forks has 76 policies in force, covering over \$14 million in property. No policies were in force in the City of Belgrade or Town of Manhattan. Any NFIP-insured structure that has had at least two paid flood losses of more than \$1,000 each in any 10-year period since 1987 is classified as a repetitive loss structure [FEMA, 2018c]. FEMA currently lists one structure in Gallatin County as being a repetitive loss property for flooding. This is a residential structure located within an unincorporated area of the county.

4.10.2 HISTORY

Gallatin County has not had a large history of significant flooding. The most recent, widespread flooding event occurred in late-May 2011 as a result of heavy rainfall and rapid melting of snowpack. **Table 4-12** lists some of the historical flooding events in the county; this data is gathered from the Flood Insurance Studies for the unincorporated areas of Gallatin County, the City of Bozeman, and the City of Three Forks, and media reports for the more recent events (2011, 2014). Flood flows on the streams studied in detail were

caused primarily by snowmelt or snowmelt and rain during April, May, and June. Flooding can also be caused by ice jams forming in the winter. This problem is especially prevalent on the lower Gallatin and Madison Rivers near Three Forks.



Street flooding in Bozeman.

Photo courtesy Gallatin County
Emergency Management

Table 4-12. Gallatin County Historical Flood Events.

Date	Location	Cause
April 1893	Bozeman Creek	Rainfall/Warm Temps
April 1937	Bozeman Creek	Rainfall/Warm Temps
April 1947	Bozeman Creek	Chinook Wind
April 1948	Bozeman Creek	Heavy Snow/Warm Temps
July 1958	Bozeman Creek	Rain Event
August 1958	Bozeman Creek	Rain Event
March 1960	Bozeman Creek	Warm Winds/ Rapid Snow Melt
June 1969	Bozeman Creek	Rain Event
May 1970	Bozeman Creek	Warm Winds/ Rapid Snow Melt
January 1974	Bozeman Creek	Warm Winds/ Rapid Snow Melt
June 1975	Bozeman Creek	Warm Winds/ Rapid Snow Melt
April 1977	Bozeman Creek	Warm Winds/ Rapid Snow Melt
Mar-Apr 1952	West Gallatin River	Rapid Snow Melt
June 1959	West Gallatin River	Rapid Snow Melt
February 1963	West Gallatin River	Warm Temps/Ice Jams
May – June 1970	West Gallatin River	High Water
June – July 1971	West Gallatin River	High Water
June 1974	West Gallatin River	Rapid Snow Melt
1899	Jefferson River	Rapid Snow Melt
1908	Jefferson River	Rapid Snow Melt
1927	Jefferson River	Rapid Snow Melt
1948	Jefferson River	Rapid Snow Melt
1949	Madison River	Ice Jam
January 1997	West Gallatin / Bozeman Creek	Rapid Snow Melt / Warm Temps
May 2008	Flooding along Gallatin River tributaries	Rapid Snow Melt with rain
May 2011	Flooding along Bozeman and Bridger Creeks and East Gallatin River	Rapid Snow Melt with rain
March 2014	Town of Manhattan	Rapid Snow Melt / Warm Temps

4.10.4 PROBABILITY

Flooding probabilities are represented spatially via floodplain maps. The 100-year floodplain has a 1% probability of being exceeded in any given year. Probabilities are typically presented as exceedance probabilities using discharges (in cubic feet per second) at various locations. **Table 4-13** shows the discharges for the stream gauges in and around Gallatin County.

2008 flooding in Outlaw Subdivision north of
Bozeman.
Photo courtesy Gallatin County Emergency Mgmt.



Table 4-13. Peak Discharges and Exceedance Probabilities for Streams in Gallatin County

Location	Probability of Exceedance		
	1%	2%	10%
	100-year event	50-year event	10-year event
Bozeman Creek at Nash Rd.	765 cfs	642 cfs	405 cfs
Bridger Creek	1260 cfs	1090 cfs	725 cfs
East Gallatin River	3300 cfs	2950 cfs	2190 cfs
West Gallatin River at Shed's Bridge	12150 cfs	11200 cfs	8700 cfs
West Gallatin River at Interstate 90	12350 cfs	11400 cfs	8850 cfs
Jefferson River at Three Forks	27600 cfs	25000 cfs	18300 cfs
Madison River at Three Forks	12000 cfs	10800 cfs	8000 cfs

4.10.5 MAPPING

Digital floodplain maps for the county were completed in September 2011 and can be downloaded at: http://gallatincomt.virtualltownhall.net/Public_Documents/gallatincomt_plandept/1FLOODPLAIN/FEMAnew/FEMAmapsNew. These maps cover many of the larger waterways across the county. Older, paper maps exist showing the 100-year floodplain in other parts of the county. Preliminary maps for the West Gallatin and Bozeman Creek mapping re-studies (described above in Section 4.10.1.1) can be accessed at: <http://dnrc.mt.gov/divisions/water/operations/floodplain-management/gallatin/maps>

When all comments and appeals are resolved, the maps are expected to be finalized and become effective in late 2019.

4.10.6 ASSOCIATED HAZARDS AND OTHER FACTORS

Excessive rainfall and heavy snows associated with flooding can be related to other hazards. Landslides and mudslides are often attributed to saturated soils and flooding. Flood conditions in and around dams can also be a factor in causing dam failures. During the summer, severe thunderstorms can bring heavy rain, especially if they are slow-moving, as well as wind, hail, and tornadoes. The runoff can cause sediment problems in addition to the flooding. These additional hazards can be factors during flood events.

4.10.7 VULNERABILITY

4.10.7.1 PROPERTY

Between Gallatin County, Bozeman and Three Forks, 863 structures are in mapped floodplains.



Winter flooding near Gallatin Gateway due to ice jam in Gallatin River. Photo courtesy Gallatin County Emergency Management.

4.10.7.2 POPULATION

Due to the terrain and hazard areas in Gallatin County, the population is considered at moderate risk for riverine flooding. Some warning does exist, particularly with riverine flooding, but rapidly occurring events may leave the population unprepared and in a dangerous situation. The impacts from flooding could be even greater in areas downstream of wildfire burn areas.

4.10.7.3 ECONOMY

Flooding can have a significant impact on the local economy. Agricultural losses may occur due to damaged crops, planting or harvesting delays, and injured livestock. Additionally, flooding can damage local businesses and cause closures. Flooding which impacts roads may slow commerce or deter tourism.

4.10.7.4 FUTURE DEVELOPMENT

Gallatin County, Bozeman, Belgrade and Three Forks have stringent floodplain regulations that are enforced. The floodplain regulations are in place to promote the public health, safety and general welfare, to minimize flood losses in areas subject to flood hazards and to promote wise use of the floodplain. These regulations are updated regularly (Gallatin County Ordinance No. 2017-011 (2017), Bozeman Ordinance 38.600(2020), Belgrade City Code 10, Three Forks City Code 12).

4.10.8 DATA LIMITATIONS

Using the default HAZUS-MH building inventory provides general estimates of risk. A more refined analysis, using local building inventory, would produce more accurate results; this was partially accounted for by using a modified dasymetric dataset, however site-specific data will always be best. An additional limitation lies in the HAZUS-MH flood model itself. It is a generalized model designed to work across the county. As a result of this, local characteristics such as updated gage data, channelization or bridge and culvert construction is not accounted for in the model. Small dams are also likely to be missed in the HAZUS-MH model depending on the resolution of the Digital Elevation Model (DEM) used.

4.10.9 OVERALL HAZARD PROFILE

District / Jurisdiction	Probability of Occurrence	Property Impact	Population Impact	Economic Impact	Overall Risk ¹ (Relative Score) (Range)
Gallatin County	Moderate	Moderate	Moderate	Moderate	Moderate (25) (13-39)
Belgrade	High	Moderate	Moderate	Moderate	High (30) (6-38)
Big Sky	Moderate	Low	Moderate	Moderate	Moderate (20) (7-52)
Bozeman	High	Moderate	Moderate	Moderate	High (33) (10-42)
Manhattan/Three Forks	High	Moderate	Moderate	Moderate	High (33) (6-37)
West Yellowstone	Low	Low	Low	Low	Low (6) (6-49)

¹ Each jurisdiction (district) determined the hazard's overall risk score by assigning values to ranking metrics that included: 1) probability that the hazard occurs, and 2) potential impacts to property, population and the economy. Criteria for assigning values to the probability and impact metrics and applying weighting factors to the different impact categories can be found in **Section 4.20, Risk Assessment Summary**.

The hazard risk scores for each jurisdiction were consolidated and then averaged to determine an overall risk score at the county level. The countywide risk scores were assigned a risk descriptor (Low, Moderate, High) based on their composite score ranking among all 19 identified hazards and by applying judgment to the final hazard rankings.

4.11 GROUND TRANSPORTATION ACCIDENT

Interstate 90 at Manhattan, MT
Photo courtesy M. Rotar.



4.11.1 DESCRIPTION

In Gallatin County, a ground transportation accident, for the purposes of this plan, includes any large-scale vehicular accident. The most likely locations for an incident of this magnitude would be on Interstate 90 or on Highway 191. Interstate 90 crosses northern Gallatin County in an east-west direction. This Interstate is widely used by large trucks, area residents, and distance travelers. Highway 191, south of the Interstate, connects Interstate 90 to West Yellowstone and Yellowstone National Park and is used by tourists visiting the park, local residents, and as a shipping route to the park and points south into Wyoming and Idaho.

4.11.2 HISTORY

Many motor vehicle accidents occur each year in Gallatin County and invariably fatalities do occur, however, a major (mass casualty) incident requiring a significant emergency response only occurs on occasion. Between 2008 and 2017, the Montana Dept. of Transportation (MDT) reported 98 roadway fatalities in Gallatin County, or an average of 9.8 deaths per year over this period. During this same 10-year period, 505 serious injuries were reported [MDT, 2018] involving motor vehicle accidents in the county. Several vehicle accidents involving three or more fatalities were recorded in Gallatin County during the period 2000-2016. These have included multiple accidents on Highway 191 in Gallatin Canyon, and an accident on Amsterdam Road west of Belgrade in 2003 that killed four occupants of a driver's education vehicle (3 students, 1 adult instructor).

4.11.3 PROBABILITY

The probability of a major ground transportation accident is considered moderate based on the historical occurrence and recent call increases. Fire departments in Gallatin County have seen a significant jump in the number of motor vehicle responses in the 1980's to where we are today. Therefore, despite a relatively low history of major ground transportation accidents, the increase in motor vehicle accident responses by the local fire departments leads to the assumption that the probability of a major ground transportation accident is increasing. The probability of a significant accident is further increased during frequent snowstorms, periods of poor visibility with blowing snow or smoke, or during times of heavy tourist traffic.

4.11.4 ASSOCIATED HAZARDS AND OTHER FACTORS

The additional hazards associated with a ground transportation accident are the obvious concerns for hazardous material releases. Any ground transportation accident involving the transport of hazardous materials increases the complexity and potential damages from that accident. Some hazards may even cause the accident such as winter storms, wildfires, earthquakes, and strong winds. Almost any hazard can cause or magnify a ground transportation mass casualty incident.

4.11.5 VULNERABILITY

4.11.5.1 PROPERTY

The critical facilities are not anticipated to be impacted by a ground transportation accident. A critical facility could be damaged or made inaccessible from the impact of an accident, but the likelihood is considered low and uniform throughout the county. Potential losses from a ground transportation accident include vehicular losses, property damages, and roadway damage. Should vehicle fluids or hazardous materials seep into a water supply, that water body would also be threatened. Typically, most losses from a ground transportation accident are covered by insurance. For a large incident, the greatest expenditures would likely be in responding agency costs.

4.11.5.2 POPULATION

Population losses are highly likely in ground transportation accidents. A ground transportation accident has the potential to kill and injure large numbers of people. Any accident involving a bus, or many vehicles has the potential for casualties numbering from 10 to 100. Therefore, the potential for large population losses is considered moderate. Indirect population impacts could occur in the Big Sky area due to limited accessibility or inability to rapidly evacuate the area as a result of a ground transportation accident.

4.11.5.3 ECONOMY

The local economy in certain portions of the county could be significantly impacted by a ground transportation accident. The Big Sky area would experience more economic disruption than other areas, as the community is accessible only via US Highway 191 and State Highway 64. Any ground transportation accident on either of these highways can temporarily isolate Big Sky from regular vehicular access. Ground transportation accidents frequently occur in the section of highway (US 191) extending from Gallatin Gateway to West Yellowstone. A minor accident in this stretch can cause road closures for up to several hours, while a major accident could potentially cause a closure for several days. Any closure has the potential to reduce traffic to and through Big Sky, which could reduce commerce activity.

4.11.5.4 FUTURE DEVELOPMENT

Future development, except for the associated increase in vehicles in the area, will not impact or will just slightly increase the probability of a large ground transportation accident. Otherwise, the specific locations of where development occurs should not significantly affect the vulnerabilities from this hazard.

4.11.6 DATA LIMITATIONS

Without much history of ground transportation accidents with mass casualties in Gallatin County, the ability to assign a probability and possible losses to this hazard is difficult. This hazard profile will always remain somewhat general unless a detailed transportation study is conducted countywide.

4.11.7 OVERALL HAZARD PROFILE

District / Jurisdiction	Probability of Occurrence	Property Impact	Population Impact	Economic Impact	Overall Risk ¹ (Relative Score) (Range)
Gallatin County	High	Low	Low	Low	Moderate (23) (13-39)
Belgrade	Moderate	Low	Low	Low	Moderate (16) (6-38)
Big Sky	High	Low	Moderate	Moderate	High (32) (7-52)
Bozeman	High	Low	Low	Low	Moderate (20) (10-42)
Manhattan/Three Forks	High	Low	Low	Low	Moderate (21) (6-37)
West Yellowstone	High	Low	Moderate	Moderate	Moderate (30) (6-49)

¹ Each jurisdiction (district) determined the hazard's overall risk score by assigning values to ranking metrics that included: 1) probability that the hazard occurs, and 2) potential impacts to property, population and the economy. Criteria for assigning values to the probability and impact metrics and applying weighting factors to the different impact categories can be found in **Section 4.20, Risk Assessment Summary**.

The hazard risk scores for each jurisdiction were consolidated and then averaged to determine an overall risk score at the county level. The countywide risk scores were assigned a risk descriptor (Low, Moderate, High) based on their composite score ranking among all 19 identified hazards and by applying judgment to the final hazard rankings.

4.12 HAZARDOUS MATERIALS RELEASE

4.12.1 DESCRIPTION

A hazardous material release is the contamination of the environment (i.e. air, water, soil) by any material that because of its quantity, concentration, or physical or chemical characteristics threatens human health, the environment, or property. An accidental or intentional release of materials could produce a health hazard to those in the immediate area, downwind, and/or downstream. A hazardous material release can come from a fixed facility or via its transportation through the area.

A major fuel pipeline, the Yellowstone Pipeline, runs through northern Gallatin County, just north of Bozeman and Interstate 90 (refer to **Figure 3-9** in Section 3, page 3-21). This pipeline transports refined petroleum products between Billings, MT and Spokane, WA. Should an explosion or leak occur on this pipeline, a large hazardous material release of the fuel and/or fumes could result and threaten the population and property.



Pipeline demarcation warning sign.

The most likely locations for a transportation-related hazardous materials release are on Interstate 90, Highway 191, or the active railways. Interstate 90 crosses northern Gallatin County in an east-west direction. This Interstate is widely used by vehicles transporting hazardous materials. Highway 191, south of the Interstate, connects Interstate 90 to Yellowstone National Park and is used as a shipping route to the park and points south into Wyoming and Idaho. In September 2006 a semi-tanker hauling propane overturned near the Lava Lake trailhead on Highway 191, forcing closure of the road for nearly 8 hours.

For the most part, the railroad parallels Interstate 90, except for short segments through Bozeman, Belgrade and Manhattan. In the western part of the county the railroad bifurcates at Logan; one line continues to the northwest past Trident and Clarkston, along the Missouri River, before exiting into Broadwater County, the other line goes through Three Forks and continues southwest to Willow Creek and Sappington Junction. The railroad is owned and operated by Montana Rail Link. If a transportation-related release occurred near populated areas or water supplies, serious human impacts could result.

4.12.2 PROBABILITY

The probability of a hazardous materials release can only be realistically assessed qualitatively. The history of events in Gallatin County is moderate with sporadic events over the past 20 years, none of which have resulted in a disaster declaration. The exposure, however, is high with Interstate 90 and an active railroad passing within close proximity to critical facilities and concentrated population in Bozeman, Belgrade, Manhattan and Three Forks.

4.12.3 MAPPING

As with many hazards, the degree of risk to a specific area is hard to quantify, however, data layers from the 2018 HAZUS-MH model runs were used to visually show the areas that have concentrations of

hazardous materials and areas that would most likely be affected in a hazardous materials incident. Of course, the entire county is at some risk for a hazardous material release.

4.12.4 ASSOCIATED HAZARDS AND OTHER FACTORS

Hazardous material releases can be accidental or intentional. Accidental causes can be due to a ground, air, or railroad accident. Almost any other hazard event may also lead to a hazardous material release. Destruction of a facility or transportation infrastructure may lead to a hazardous material release. Examples include earthquake, flooding, wildfire, avalanche, landslide, dam failure, severe thunderstorm, tornado, wind, structure fire, or even a volcano. Intentional releases may be related to terrorism or a domestic disturbance. A hazardous material release, if severe enough, could lead to civil unrest, a fiery explosion, or utility failure. Hazardous material releases could likely aggravate almost any other hazard.



Hazardous Materials incident training.



Semi-truck rollover and fuel spill.

Photos courtesy Gallatin County Emergency Management

4.12.5 VULNERABILITY

4.12.5.1 PROPERTY

The buffers around the highways and railways represent the areas that have an enhanced risk for a hazardous materials release. Two buffer zones were established, 0.25 miles and 0.50 miles from the route. These buffer zones were chosen based on a minimum evacuation radius that would be established for a typical hazardous substance release. Of course, the actual evacuation zone for an event is highly dependent on many factors including wind speed, wind direction, material released, and quantity released. Like many of the other hazards, the hazard area in an actual event will not involve the entire area at risk, but more likely only a small section of the identified area, and therefore, a small percentage of the critical facilities. Based on these buffer zones, it was determined that a good portion of the Gallatin County critical infrastructure is at greatest risk.

Since the Interstate 90 and the Montana Rail Link corridor hauls more hazardous materials than the other transportation routes, the highest risk can be assumed to be in that area. Generally, the only structures affected by a hazardous materials release are the structures that house the material on a daily basis. Fortunately, unless an explosion is present with the release, structures are typically not damaged in a hazardous materials release. A large-scale release in an area with numerous structures will put those structures and contents at risk, however the structure itself will generally withstand the event unharmed.

4.12.5.2 POPULATION

The population impacts from a hazardous materials release are more significant than the potential structure losses. Depending on the material, the health impacts to the public can be long and short term.

Should a release occur in Bozeman, the population impacts would be much greater than if one occurred in a more rural area. In a hazardous materials release, those in the immediate area would have little to no warning, whereas, the population in the dispersion path may have some time to evacuate, depending on the weather conditions and material released.

Many factors will determine the true hazard area in a transportation related hazardous material release. The worst-case scenario would be a release along the railroad near any of the populated areas. Given this scenario, a conservative estimate of 1,000 structures could be directly affected and/or evacuated. With an estimated 2.5 people per structures (and possibly higher for downtown Bozeman, Belgrade, Manhattan or Three Forks), up to 2,500 people could be at risk in such an event.

4.12.5.3 ECONOMY

Temporary business closures may occur with hazardous material releases. In cases where the release causes an explosion or fire, the closure period may be considerable. Any hazardous materials release which impacts surface water has the potential to impact the tourism economy.

4.12.5.4 FUTURE DEVELOPMENT

Much of the future development expected to occur is off the major road and rail networks in the county. The potential, however, does exist for development of agricultural lands bordering the highways and railroad, particularly in the unincorporated parts of Gallatin County. Very few restrictions are in place to prevent development in these areas.

4.12.6 DATA LIMITATIONS

Understanding when, where, and what substances are mostly likely to be released in a hazardous materials incident is the greatest limitation in analyzing this hazard. Hazardous substances pass through Gallatin County with such regularity and without incident that fully describing how a release may occur and what population and structures may be affected is not possible. A study of the number and types of hazardous materials passing through Gallatin County would help better frame this profile. A complete database of hazardous materials sites would also allow for more accurate estimates of potential losses and population impacts. Digital mapping of the fixed facilities would allow for a more detailed analysis of vulnerabilities from a release at those facilities.

4.12.7 OVERALL HAZARD PROFILE

District / Jurisdiction	Probability of Occurrence	Property Impact	Population Impact	Economic Impact	Overall Risk ¹ (Relative Score) (Range)
Gallatin County	Moderate	Low	Moderate	Moderate	Moderate (23) (13-39)
Belgrade	Moderate	Low	Moderate	Moderate	Moderate (18) (6-38)
Big Sky	High	Low	Moderate	Moderate	Moderate (26) (7-52)
Bozeman	Moderate	Low	Moderate	Moderate	Moderate (22) (10-42)
Manhattan/Three Forks	Moderate	Moderate	Moderate	Moderate	Moderate (23) (6-37)
West Yellowstone	Moderate	Moderate	Moderate	Moderate	Moderate (24) (6-49)

¹ Each jurisdiction (district) determined the hazard's overall risk score by assigning values to ranking metrics that included: 1) probability that the hazard occurs, and 2) potential impacts to property, population and the economy. Criteria for assigning values to the probability and impact metrics and applying weighting factors to the different impact categories can be found in **Section 4.20, Risk Assessment Summary**.

The hazard risk scores for each jurisdiction were consolidated and then averaged to determine an overall risk score at the county level. The countywide risk scores were assigned a risk descriptor (Low, Moderate, High) based on their composite score ranking among all 19 identified hazards and by applying judgment to the final hazard rankings.

4.13 RAILROAD ACCIDENT

4.13.1 DESCRIPTION

Montana Rail Link (MRL) operates on a railroad that crosses Gallatin County in an east-west direction, roughly parallel to Interstate 90, and passing through the Cities of Bozeman, Belgrade, and Three Forks and the Town of Manhattan. MRL is a Federal Railroad Administration (FRA) Class II regional railroad with 937 route miles serving over 125 local businesses in the states of Montana, Idaho and Washington, and employs nearly 1,200 people [MRL, 2018]. MRL connects with Spokane, Washington, the Burlington Northern & Santa Fe Railway (BNSF) at Laurel and Helena, Montana, the Montana Western Railway at Garrison, Montana, and the Union Pacific Railroad at Sandpoint, Idaho.



2011 train derailment in Bozeman (photo courtesy of Travis Munter)

Table 4-14 provides a list of documented rail accidents in Gallatin County since 1981.

Table 4-14. Railroad Accidents in Gallatin County, Montana [Federal Railroad Administration, 2018]¹

Date	Reportable Damage (\$)	Casualties
12-10-2018	not available	1 injury
09-20-2016	16,700	0
02-20-2013	15,000	0
05-08-2012	10,500	0
02-20-2011	850,000	0
03-15-2008	1,838,552	0
11-22-2006	25,000	1 Injury
09-26-2006	20,000	0

Date	Reportable Damage (\$)	Casualties
06-02-2005	35,000	1 Injury
02-13-2005	153,000	0
10-12-2004	10,000	0
08-15-2002	450,000	0
11-08-2002	262,000	2 Injuries
02-27-2001	18,000	0
03-31-2001	23,000	0
10-25-2001	24,227	0
07-09-1998	30,000	2 Injuries
12-05-1997	25,500	0
09-02-1996	11,600	0
10-29-1996	52,000	0
02-08-1993	170,000	0
06-28-1993	22,500	0
10-08-1992	15,000	0
01-09-1991	23,000	0
03-16-1991	288,000	0
07-05-1991	155,000	0
12-29-1991	7,300	0
01-26-1989	8,000	0
03-09-1989	79,500	0
05-26-1989	18,000	0
11-08-1989	202,000	0
05-22-1988	12,500	0
05-25-1988	56,000	0
07-19-1988	11,000	0
10-05-1988	35,500	0
12-19-1988	251,700	0
09-01-1987	743,970	2 Injuries
05-09-1986	70,000	0
04-13-1985	58,500	0
11-24-1985	25,500	0
11-30-1985	162,000	0
12-14-1985	191,800	0
06-10-1984	5,400	0
08-05-1984	97,200	0
10-24-1984	34,000	0

Date	Reportable Damage (\$)	Casualties
12-04-1984	25,300	0
11-02-1983	13,200	0
09-01-1982	72,000	0
01-28-1981	5,720	0

4.13.2 HISTORY

The railroads in Gallatin County were operated by Burlington Northern Railroad from 1970 to 1987 until Montana Rail Link assumed control of the route through southern Montana.

4.13.3 PROBABILITY

Since 1981, 49 railroad accidents have occurred resulting in \$6,719,669 in track and equipment damages and 9 injuries. Using this historical record, on average, a railroad accident occurs 1.29 times per year (49 accidents / 38 years) in Gallatin County. The average accident causes \$137,136 (\$6,719,669 / 49 accidents) in damage. Obviously, incidents do not follow averages, and therefore, the maximum and minimum damages over the past 38 years should be noted. Another important consideration in a railroad accident is the release of hazardous materials. The historical record shows this has only occurred twice in the past thirty years, but the potential certainly exists as demonstrated by the number of hazardous material cars involved, but not damaged, in railroad accidents.

4.13.4 MAPPING

The locations and routes of active rail lines in Gallatin County are well known and mapped appropriately.

4.13.5 ASSOCIATED HAZARDS AND OTHER FACTORS

A railroad accident is hazardous to those in close proximity to, and operating, the train due to physical impacts, but others may be threatened by associated hazards. A hazardous material release is the most probable associated hazard. Those effects are described in detail in the hazardous materials hazard profile. Almost any other hazard could also cause a railroad accident. Weather conditions can damage tracks or affect the locomotives and cars. For example, strong winds can blow cars from the tracks; winter storms, cold weather, and hot weather can warp tracks; avalanches, landslides, and flooding can cover rail routes; hail and tornadoes can damage cars; and fog and smoke can limit visibility. An earthquake or volcano could also damage tracks or equipment. The possibility that a train could be used in a terrorist attack cannot be ruled out. All associated hazards increase the probability of a railroad accident occurring.

4.13.6 VULNERABILITY

4.13.6.1 PROPERTY

Gallatin County critical facilities are not considered at increased risk from a railroad accident. Associated hazards may threaten facilities, but the accident itself should not directly impact the critical facilities.

Most of the losses from a railroad accident are paid for by Montana Rail Link or their insurance. Potential community losses are most probable to infrastructure such as roadways. Should a derailment occur on a state, county, or city road, that road could be unusable for several days or weeks. Staff time in coordinating

the clean up or response could be considered additional railroad accident losses. In terms of structures that could be impacted by a derailment, a limited number are located within 250 feet of the railroad. Most accidents would probably only impact one or two structures. Damages could vary in the hundreds of thousands of dollars depending on the structure or structures impacted.

4.13.6.2 POPULATION

Since the active railroad in Gallatin County no longer serves passengers, the potential for high casualties from the impact of a railroad accident is low. The potential certainly exists, however, for casualties to railroad workers and those in the general vicinity, especially since the trains pass through the center of three towns. The potential for large population impacts is considered low, however, particularly when considering the historical record of only 9 injuries over the past 38 years and 49 accidents.

4.13.6.3 ECONOMY

Economic losses due to a train derailment are possible, though likely limited.

4.13.6.4 FUTURE DEVELOPMENT

Future development should have little impact on railroad accident hazard. Most development is occurring away from the railroad's immediate impact area, but few restrictions exist to prevent such development.

4.13.7 DATA LIMITATIONS

The data on the railroad hazard in Gallatin County is based on FRA records. This data is sufficient to calculate the occurrence likelihood over the past 30 years. Where the data is not useful is in determining the probability of a large-scale accident involving hazardous materials. An analysis of the current railroads, numbers/types of materials transported, and areas with the greatest potential for derailment would enhance this profile. Such information would not necessarily be included in a public plan.

4.13.8 OVERALL HAZARD PROFILE

District / Jurisdiction	Probability of Occurrence	Property Impact	Population Impact	Economic Impact	Overall Risk ¹ (Relative Score) (Range)
Gallatin County	Moderate	Low	Low	Low	Low (13) (13-39)
Belgrade	Moderate	Low	Moderate	Low	Moderate (18) (6-38)
Big Sky ²	N/A	N/A	N/A	N/A	N/A
Bozeman	Moderate	Low	Low	Low	Moderate (16) (10-42)
Manhattan/Three Forks	Moderate	Low	Low	Low	Low (14) (6-37)
West Yellowstone ²	N/A	N/A	N/A	N/A	N/A

¹ Each jurisdiction (district) determined the hazard's overall risk score by assigning values to ranking metrics that included: 1) probability that the hazard occurs, and 2) potential impacts to property, population and the economy. Criteria for assigning values to the probability and impact metrics and applying weighting factors to the different impact categories can be found in **Section 4.20, Risk Assessment Summary**.

The hazard risk scores for each jurisdiction were consolidated and then averaged to determine an overall risk score at the county level. The countywide risk scores were assigned a risk descriptor (Low, Moderate, High) based on their composite score ranking among all 19 identified hazards and by applying judgment to the final hazard rankings.

² There are no active railroads in this district.

4.14 SEVERE WEATHER

4.14.1 DESCRIPTION

Thunderstorms in Montana develop when moisture in the air rises, often from daytime ground heating, an unstable atmospheric condition, synoptic front, or by terrain uplift, and cools higher in the atmosphere, condensing into rain droplets or ice crystals. The cloud grows as these conditions continue and the atmospheric instability allows. Lightning can be produced, with or without rain, as a charge builds up in the cloud. With the right atmospheric conditions, updrafts and downdrafts form in the thunderstorm structure. These strong updrafts and downdrafts can produce hail, strong straight-line winds, and even tornadoes.

Hail is produced when a super cooled droplet collects a layer of ice and continues to grow, sustained by the updraft. Once the hail stone cannot be held up any longer by the updraft, it falls to the ground. Gallatin County regularly has small, pea-sized hail, but larger stones to the size of quarters or larger are possible.

Strong straight-line winds, sometimes stronger than tornadoes at over 100 mph, occur when air is carried into a storm updraft, cools rapidly, and comes rushing to the ground. Cold air is denser than warm air, and therefore, wants to fall to the surface. On warm summer days, when the cold air can no longer be supported up by the storm's updraft, the air crashes to the ground in the form of strong winds. These winds are forced horizontally when they reach the ground and can cause significant damage.

Tornadoes form when the right amount of shear is present in the atmosphere and causes the updraft and downdraft to rotate. A funnel cloud is the rotating column of air extending out of a cloud base, but not yet touching the ground. The funnel cloud does not become a tornado until it touches the ground. Once in contact with the surface, it can create great damage over a small area. Although rare, they can and do occur in south central Montana.

A severe thunderstorm is defined by the National Weather Service (NWS) as a thunderstorm that produces wind gusts at or greater than 58 mph (50 knots), hail $\frac{3}{4}$ " or larger, and/or tornadoes. Although not considered severe by definition, lightning and heavy rain can also accompany thunderstorms. The severe conditions are often the events that can directly cause widespread damage. Strong winds, hail, and tornadoes have capability to damage structures, infrastructure, crops, livestock, and vehicles.



Summer thunderstorm over Bozeman.

Photo courtesy Jason Shrauger



2008 Summer hailstorm at Montana State University

Photo courtesy Patrick Lonergan

4.14.2 HISTORY

Hail and strong winds frequently occur in thunderstorms in Gallatin County as documented in **Table 4-15** [USDA-NRCS, National Water & Climate Center (NWCC), 2017]

Table 4-15. Severe Weather Events in Gallatin County since 2000 [NRCS-NWCC, 2017]

Location or County	Date	Time	Type	Magnitude	Deaths	Injuries	Prop. Damage	Crop Damage
MTZ055	1/4/2010	20:00	Winter Storm	N/A	0	0	OK	OK
MTZ055	1/22/2010	8:00	Winter Storm	N/A	0	0	OK	OK
MTZ055	3/18/2010	18:00	Heavy Snow	N/A	0	0	OK	OK
MTZ055	3/30/2010	17:00	Winter Storm	N/A	0	0	OK	OK
MTZ055	4/6/2010	12:00	Winter Storm	N/A	0	0	OK	OK
MTZ055	4/8/2010	13:35	High Wind	55 kts.	0	0	OK	OK
MTZ055	4/28/2010	6:00	Winter Storm	N/A	0	0	OK	OK
MTZ055	5/3/2010	13:15	High Wind	51 kts.	0	0	OK	OK
MTZ008	5/5/2010	14:00	Winter Storm	N/A	0	0	OK	OK
Bozeman	6/30/2010	13:41	Hail	1.00	0	0	OK	OK
Bozeman	6/30/2010	13:47	Hail	1.75	0	0	OK	OK
Belgrade	6/30/2010	14:12	Hail	2.75	0	0	OK	OK
Bozeman	6/30/2010	15:00	Hail	1.50	0	0	OK	OK
Bozeman	6/30/2010	15:00	Hail	2.00	0	0	OK	OK
Gallatin Gateway	6/30/2010	15:00	Hail	1.25	0	0	OK	OK
Bozeman	6/30/2010	15:03	Hail	1.00	0	0	60.0 M	OK
Bozeman	6/30/2010	15:05	Hail	1.75	0	0	OK	OK
Three Forks	7/27/2010	15:05	Hail	1.00	0	0	OK	OK
Gallatin Gateway	7/31/2010	17:00	Hail	1.50	0	0	OK	OK
Bozeman	8/1/2010	16:35	T-storm	52 kts.	0	0	OK	OK
MTZ055	10/26/2010	13:07	Winter Storm	N/A	0	0	OK	OK

Location or County	Date	Time	Type	Magnitude	Deaths	Injuries	Prop. Damage	Crop Damage
MTZ055	11/18/2010	6:15	High Wind	52 kts.	0	0	OK	OK
MTZ055	11/18/2010	8:35	High Wind	51 kts.	0	0	OK	OK
MTZ055	11/18/2010	9:35	High Wind	55 kts.	0	0	OK	OK
MTZ015 - 055	11/18/2010	12:00	Winter Storm	N/A	0	0	OK	OK
MTZ055	11/18/2010	21:24	Winter Storm	N/A	0	0	OK	OK
MTZ008	11/22/2010	6:00	Winter Storm	N/A	0	0	OK	OK
MTZ008-015- 055	11/23/2010	6:59	Blizzard	N/A	0	0	OK	OK
MTZ009	2/6/2011	19:00	Winter Storm	N/A	0	0	OK	OK
MTZ009-048- 055	2/16/2011	4:00	Winter Storm	N/A	0	0	OK	OK
MTZ009 - 055	2/22/2011	3:00	Winter Storm	N/A	0	0	OK	OK
MTZ055	3/10/2011	16:04	High Wind	65 kts.	0	0	OK	OK
MTZ011	3/21/2011	8:00	Winter Storm	N/A	0	0	OK	OK
MTZ051 - 055	4/18/2011	17:00	Winter Storm	N/A	0	0	OK	OK
MTZ009	4/29/2011	4:00	Winter Storm	N/A	0	0	OK	OK
MTZ008-05 - 055	5/9/2011	3:00	Winter Storm	N/A	0	0	OK	OK
MTZ055	5/14/2011	19:36	High Wind	54 kts.	0	0	OK	OK
MTZ008	5/29/2011	3:24	Winter Storm	N/A	0	0	OK	OK
Logan	6/6/2011	15:55	Hail	1.50	0	0	OK	OK
Bozeman	6/12/2011	19:05	Hail	1.00	0	0	OK	OK
Big Sky	6/23/2011	16:04	T-storm	51 kts.	0	0	OK	OK
Bozeman	7/25/2011	17:35	T-storm	50 kts.	0	0	OK	OK
Gallatin	11/12/2011	3:57	Winter Storm	N/A	0	0	OK	OK
Gallatin	11/17/2011	12:00	Winter Storm	N/A	0	0	OK	OK
Gallatin	12/20/2011	20:00	Winter Storm	N/A	0	0	OK	OK
Gallatin	12/28/2011	10:30	High Wind	52 kts.	0	0	OK	OK
Gallatin	01/18/2012	01:07	High Wind	55 kts.	0	0	OK	OK
Gallatin	01/25/2012	02:15	High Wind	52 kts.	0	0	OK	OK
Gallatin	03/06/2012	05:00	Winter Storm	N/A	0	0	OK	OK
Gallatin	03/13/2012	11:15	High Wind	54 kts.	0	0	OK	OK
Gallatin	03/19/2012	05:00	Winter Storm	N/A	0	0	OK	OK
Gallatin	03/30/2012	11:35	High Wind	51 kts.	0	0	OK	OK
Gallatin	04/05/2012	05:00	Winter Storm	N/A	0	0	OK	OK
Bozeman	04/23/2012	15:20	T-storm	57 kts.	0	0	OK	OK
Gallatin	04/26/2012	19:00	Winter Storm	N/A	0	0	OK	OK
Gallatin	06/09/2012	12:00	Heavy Snow	N/A	0	0	OK	OK
Gallatin	06/26/2012	10:00	High Wind	60 kts.	0	0	OK	OK
Bozeman	07/10/2012	17:50	T-storm	51 kts.	0	0	OK	OK
Chestnut	09/01/2012	16:12	T-storm	52 kts.	0	0	OK	OK

Location or County	Date	Time	Type	Magnitude	Deaths	Injuries	Prop. Damage	Crop Damage
Gallatin	10/16/2012	14:45	High Wind	54 kts.	0	0	OK	OK
Gallatin	11/08/2012	02:00	Heavy Snow	N/A	0	0	OK	OK
Gallatin	11/30/2012	00:00	Heavy Snow	N/A	0	0	OK	OK
Gallatin	12/01/2012	00:00	Heavy Snow	N/A	0	0	OK	OK
Gallatin	12/02/2012	08:00	High Wind	51 kts.	0	0	OK	OK
Gallatin	12/09/2012	23:00	Heavy Snow	N/A	0	0	OK	OK
Gallatin	01/09/2013	04:35	High Wind	52 kts.	0	0	OK	OK
Gallatin	01/10/2013	07:30	Heavy Snow	N/A	0	0	OK	OK
Gallatin	01/28/2013	06:00	Heavy Snow	N/A	0	0	OK	OK
Gallatin	01/31/2013	05:00	Heavy Snow	N/A	0	0	OK	OK
Gallatin	02/09/2013	18:00	Heavy Snow	N/A	0	0	OK	OK
Gallatin	02/17/2013	02:00	Heavy Snow	N/A	0	0	OK	OK
Gallatin	02/22/2013	15:00	Heavy Snow	N/A	0	0	OK	OK
Gallatin	03/07/2013	09:00	Heavy Snow	N/A	0	0	OK	OK
Gallatin	03/17/2013	04:00	Heavy Snow	N/A	0	0	OK	OK
Gallatin	03/20/2013	08:00	High Wind	51 kts.	0	0	OK	OK
Gallatin	06/19/2013	18:27	High Wind	52 kts.	0	0	OK	OK
Big Sky	07/17/2013	18:15	T-storm	60 kts.	0	0	OK	OK
Amsterdam	08/01/2013	17:04	T-storm	68 kts.	0	0	OK	OK
Manhattan	08/01/2013	17:07	T-storm	77 kts.	0	0	OK	OK
Bozeman	08/01/2013	17:10	T-storm	53 kts.	0	0	OK	OK
Manhattan	08/01/2013	17:14	Hail	1.5 in.	0	0	OK	OK
Belgrade	08/01/2013	17:15	Hail	1.75 in.	0	0	OK	OK
Bozeman	08/01/2013	17:37	Hail	1.5 in.	0	0	OK	OK
Bozeman	08/23/2013	15:50	T-storm	50 kts.	0	0	OK	OK
Bozeman	09/16/2013	13:28	T-storm	50 kts.	0	0	OK	OK
Chestnut	09/24/2013	19:25	T-storm	51 kts.	0	0	OK	OK
Gallatin	09/30/2013	11:50	High Wind	52 kts.	0	0	OK	OK
Gallatin	10/03/2013	00:00	Heavy Snow	N/A	0	0	OK	OK
Gallatin	11/02/2013	19:30	Heavy Snow	N/A	0	0	OK	OK
Gallatin	11/04/2013	01:00	Heavy Snow	N/A	0	0	OK	OK
Gallatin	11/07/2013	22:40	High Wind	50 kts.	0	0	OK	OK
Gallatin	11/16/2013	00:00	Heavy Snow	N/A	0	0	OK	OK
Gallatin	11/20/2013	04:00	Heavy Snow	N/A	0	0	OK	OK
Gallatin	12/02/2013	07:00	Heavy Snow	N/A	0	0	OK	OK
Gallatin	12/18/2013	13:00	Heavy Snow	N/A	0	0	OK	OK
Gallatin	12/23/2013	22:25	High Wind	59 kts.	0	0	OK	OK
Gallatin	01/03/2014	09:55	High Wind	52 kts.	0	0	OK	OK

Location or County	Date	Time	Type	Magnitude	Deaths	Injuries	Prop. Damage	Crop Damage
Gallatin	01/11/2014	12:55	High Wind	54 kts.	0	0	OK	OK
Gallatin	01/29/2014	06:00	Heavy Snow	N/A	0	0	OK	OK
Gallatin	02/12/2014	11:15	High Wind	53 kts.	0	0	OK	OK
Gallatin	02/17/2014	13:48	High Wind	51 kts.	0	0	OK	OK
Gallatin	02/27/2014	18:30	Heavy Snow	N/A	0	0	OK	OK
Gallatin	03/10/2014	14:00	Heavy Snow	N/A	0	0	OK	OK
Gallatin	03/17/2014	05:00	Heavy Snow	N/A	0	0	OK	OK
Gallatin	03/29/2014	22:00	Heavy Snow	N/A	0	0	OK	OK
Gallatin	04/18/201	17:12	High Wind	50 kts.	0	0	OK	OK
Gallatin	04/22/2014	19:40	Heavy Snow	N/A	0	0	OK	OK
Gallatin	04/27/2014	21:00	Heavy Snow	N/A	0	0	OK	OK
Gallatin	10/15/2014	17:30	High Wind	51 kts.	0	0	OK	OK
Gallatin	11/09/2014	14:36	High Wind	50 kts.	0	0	OK	OK
Gallatin	11/13/2014	20:00	Heavy Snow	N/A	0	0	OK	OK
Gallatin	11/24/2014	16:00	Heavy Snow	N/A	0	0	OK	OK
Gallatin	11/29/2014	10:00	Heavy Snow	N/A	0	0	OK	OK
Gallatin	12/13/2014	09:00	Heavy Snow	N/A	0	0	OK	OK
Gallatin	03/28/2015	10:54	High Wind	59 kts.	0	0	OK	OK
Church Hill	06/01/2015	15:06	Hail	1 in.	0	0	OK	OK
Gallatin	10/11/2015	10:56	High Wind	56 kts.	0	0	OK	OK
Gallatin	11/02/2015	17:00	Winter Storm	N/A	0	0	OK	OK
Gallatin	11/15/2015	03:41	High Wind	59 kts.	0	0	OK	OK
Gallatin	11/24/2015	11:0	Winter Storm	N/A	0	0	OK	OK
Gallatin	12/09/2015	14:45	High Wind	61 kts.	0	0	OK	OK
Gallatin	12/13/2015	14:00	Winter Storm	N/A	0	0	OK	OK
Gallatin	02/06/2016	09:15	High Wind	65 kts.	0	0	OK	OK
Gallatin	02/15/2016	06:00	High Wind	65 kts.	0	0	OK	OK
Gallatin	02/18/2016	12:42	High Wind	54 kts.	0	0	OK	OK
Bozeman	04/04/2016	18:21	T-storm	56 kts.	0	0	OK	OK
Gallatin	05/09/2016	13:20	Winter Storm	N/A	0	0	OK	OK
Gallatin	10/11/2016	04:30	Winter Storm	N/A	1	0	OK	OK
Gallatin	11/16/2016	16:30	Winter Storm	N/A	0	0	OK	OK
Gallatin	12/16/2016	13:43	Winter Storm	N/A	0	0	OK	OK
Gallatin	12/17/2016	05:00	Extreme Cold	N/A	0	0	OK	OK
Gallatin	12/18/2016	03:00	High Wind	63 kts.	0	0	OK	OK
Gallatin	12/26/2016	14:00	High Wind	50 kts.	0	0	OK	OK
Gallatin	01/31/2017	07:00	Winter Storm	N/A	0	0	OK	OK
Manhattan	04/25/2017	12:38	Funnel Cloud	N/A	0	0	OK	OK

Location or County	Date	Time	Type	Magnitude	Deaths	Injuries	Prop. Damage	Crop Damage
Logan	04/25/2017	15:48	Funnel Cloud	N/A	0	0	OK	OK
Gallatin	05/17/2017	19:00	Winter Storm	N/A	0	0	OK	OK
Gallatin	05/24/2017	14:35	High Wind	50 kts.	0	0	OK	OK
Bozeman	07/05/2017	15:56	T-storm	50 kts.	0	0	OK	OK
Matthews	07/05/2017	16:11	T-storm	52 kts.	0	0	OK	OK
Amsterdam	07/05/2017	16:11	T-storm	56 kts.	0	0	OK	OK

Despite a lack of significant tornadoes in Gallatin County’s weather records, in nearby Yellowstone National Park just to the south, an F4 tornado (207-260 mph) formed on July 21, 1987. The Teton-Yellowstone Tornado, as it was named, was 1.5 miles (2.5 km) wide and traveled for 24 miles (39.2 km). The tornado crossed the Continental Divide at an elevation of 10,072 feet (3,070 m). Tornadoes like the Teton-Yellowstone Tornado are rare but possible in places like Gallatin County, Montana. More likely in Gallatin County are smaller, shorter lived, yet damaging tornadoes.

4.14.3 PROBABILITY

The history of hail and strong thunderstorm winds in Gallatin County shows that both are frequent. The data presented in the history is based on reports received by the NWS in Great Falls, MT. Often, unless the event is noticed by a trained spotter or emergency official, the event will go unreported. Therefore, many events may not have been reported or noted by observers and the statistics represent only those events that have been documented.

4.14.4 MAPPING

Severe thunderstorms can occur anywhere in Gallatin County. Due to the sporadic population centers in Gallatin County, mapping the locations of historical events would show where events have been spotted and reported from, but would not necessarily depict the hazard level from severe thunderstorms. Infrequently traveled areas may have a larger concentration of severe thunderstorm events, but because of the low population, events have gone unreported. Therefore, the risk is assumed to be the same countywide.

4.14.5 ASSOCIATED HAZARDS AND OTHER FACTORS

Severe thunderstorms and tornadoes can be associated with other hazards. Lightning can spark wildfire or urban fires, especially when coupled with strong winds, and heavy rains can cause flash flooding. These hazards can also contribute to ground or aircraft accidents if they interfere with travel. Fortunately, most pilots are trained to recognize hazardous weather conditions such as severe thunderstorms. Particularly severe thunderstorms can also lead to widespread power and communications failures.

4.14.6 VULNERABILITY

4.14.6.1 PROPERTY

All critical facilities and vulnerable populations are considered to have the same vulnerability to severe thunderstorms, unless specific reinforcements have been made to protect them from strong winds. Infrastructure, namely power lines, are primarily vulnerable to high winds and falling trees. Power systems are the most likely infrastructure to fail during a severe thunderstorm. Communications towers may also topple under strong winds or large hail. Infrastructure at a reduced risk from severe thunderstorms and tornadoes include those utilities located underground or within reinforced structures.

With the entire county at risk from severe thunderstorms and tornadoes, estimates of damages are hard to determine. Realistically, an event involving a tornado or severe thunderstorm would most likely significantly affect only a small area. If that area, however, was in a developed part of the county, 10-20 homes could be damaged. Vehicles damaged by hail or falling debris would be additional losses. Potential losses could also include losses to agriculture. Livestock and crops can be significantly damaged by large hail and strong winds, and therefore, result in diminished profits.

4.14.6.2 POPULATION

The NWS in Great Falls, MT warns for severe thunderstorms and tornadoes when recognized on Doppler radar or by other means. The warnings are broadcast over NOAA weather radio and may be transmitted over television scrolls and cable networks such as the Weather Channel. Some events have 15-20 minutes warning time and others have little to no warning. Depending on the effectiveness of the warning reaching the population, those at greatest risk may or may not receive the warning and take precautionary measures. A NOAA weather radio transmitter is located in Bozeman, and those with specially built receivers can be alerted to weather hazards rapidly. The numerous campgrounds in the National Forests become particularly vulnerable populations if the warnings are not received. Depending on the significance of the storm, much of the population can be at risk if they do not take appropriate action.

4.14.6.3 ECONOMY

Severe thunderstorms and tornadoes can damage businesses and cause temporary closures. Often the largest losses are seen in the agriculture industry, when weather events damage crops or livestock.

4.14.6.4 FUTURE DEVELOPMENT

Future development will likely have little effect on the vulnerability to severe thunderstorms and tornadoes. The risk is assumed to be uniform countywide, and therefore, the location of development does not increase or reduce the risk necessarily. Development and population growth may in fact improve the television and radio technology available to residents, and therefore, improve the warning capabilities.

4.14.7 DATA LIMITATIONS

Severe thunderstorms and tornadoes can be such isolated events that the vulnerability to a specific area can be hard to determine. Weather data is often limited by the observations taken, and severe thunderstorm and tornado events are only recorded if reported to the NWS. An in-depth study specific to Gallatin County would need to be conducted to further develop this hazard profile. Historic lightning data may also pinpoint the areas that receive the most thunderstorms.

4.14.8 OVERALL HAZARD PROFILE

District / Jurisdiction	Probability of Occurrence	Property Impact	Population Impact	Economic Impact	Overall Risk ¹ (Relative Score) (Range)
Gallatin County	Moderate	Moderate	Moderate	Moderate	High (31) (13-39)
Belgrade ²	High	Moderate	High	Moderate	High (36) (6-38)
Big Sky ²	Moderate	Moderate	Moderate	Moderate	Moderate (28) (7-52)
Bozeman	High	Moderate	High	Moderate	High (37) (10-42)
Manhattan/Three Forks ²	High	Moderate	Moderate	Moderate	High (37) (6-37)
West Yellowstone	High	Moderate	High	Moderate	High (45) (6-49)

¹ Each jurisdiction (district) determined the hazard's overall risk score by assigning values to ranking metrics that included: 1) probability that the hazard occurs, and 2) potential impacts to property, population and the economy. Criteria for assigning values to the probability and impact metrics and applying weighting factors to the different impact categories can be found in **Section 4.20, Risk Assessment Summary**.

The hazard risk scores for each jurisdiction were consolidated and then averaged to determine an overall risk score at the county level. The countywide risk scores were assigned a risk descriptor (Low, Moderate, High) based on their composite score ranking among all 19 identified hazards and by applying judgment to the final hazard rankings.

² Each of these districts maintained a separate hazard for severe summer (thunderstorms, tornadoes, wind), and severe winter (extreme cold, winter storms) events as part of the hazards ranking exercise. The probability of occurrence and impact values included in this table represent the higher of the two values for purposes of determining overall risk for Severe Weather.

4.15 TERRORISM

4.15.1 DESCRIPTION

Terrorism is defined in the Code of Federal Regulations (28 CFR, Section 0.85) as "the unlawful use of force and violence against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political or social objectives". Terrorists look for visible targets where they can avoid detection before or after an attack such as international airports, large cities, major international events, resorts, and high-profile landmarks. Bombings involving detonated and undetonated explosive devices, tear gas, and pipe and fire-bombs have been the most frequently used terrorist method in the United States. Other possible methods include attacks on transportation routes, utilities, or other public services, or incidents involving chemical or biological agents.

Lone gunman shootings (active shooter incidents) are sometimes described as a form of terrorism. However, without a nexus to a declared terrorist organization, an extremist ideology or belief system, or specific political objective, these attacks are rarely classified officially as terrorism. In the U.S., an individual that instigates or imposes violence towards a group of people is often said to be a "lone-actor" or "lone-wolf" if they are believed to operate independently, and not as part of a larger organization. These violent acts often involve firearms but can also involve chemical or explosive devices. Most of these incidents occur at locations deliberately selected for an attack and not simply a random site of opportunity. Schools, movie theaters, and stadiums and other large venues used for sports events or concerts are common locations chosen to conduct these unlawful acts. Mass-casualty shootings have sparked a political debate in the U.S. over gun violence, whether firearms should be allowed in the classroom and whether there should be more restrictive gun control laws.



Active shooter training in Bozeman. Photo courtesy Gallatin County Emergency Management.

Chemical terrorism is the use of chemical agents to poison, kill, or incapacitate the population. Chemical agents can be broken into five different categories: nerve agents, vesicants, cyanide, pulmonary agents, and incapacitating agents. Known nerve agents include tabun, sarin, soman, GF, and VX, and can cause a variety of conditions affecting the central nervous system either through vapor or liquid form. Vesicants cause blisters on the skin and can damage eyes, airways, and other tissues and organs. Vesicant agents include sulfur mustard, Lewisite, and phosgene oxime. Cyanides can be in solid salt or volatile liquid format, or when combined with acid, a vapor or gas. Their absorption can cause everything from nausea to death, depending on the amount absorbed. Pulmonary agents such as phosgene and perfluoroisobutylene cause pulmonary edema usually hours after exposure. Incapacitating agents, such as BZ, produce reversible disturbances with the central nervous system and cognitive abilities.

Terrorism using explosive and incendiary devices includes bombs and any other technique that creates an explosive, destructive effect. Bombs can take many forms from a car bomb to a mail bomb to any suspicious package. They can be remotely detonated using a variety of devices or directly detonated in the case of a suicide bomb.

Bioterrorism is the use of biological agents to infect the population or animals with disease. The agents/diseases that the CDC consider the highest priority due to their threat to the population and national security include anthrax, botulism, plague, smallpox, tularemia, and viral hemorrhagic fevers. Bioterrorism could also be used against livestock population and agricultural plants. The following are select animal diseases identified by the USDA as a severe threat to livestock and human health: Avian Influenza, Exotic Newcastle Disease, Nipah, Hendra, Eastern Equine Encephalitis, Venezuelan Equine Encephalomyelitis, Foot and Mouth Disease, Rift Valley Fever, Rinderpest, African Swine Fever, and Classical Swine Fever. Those plant diseases identified by the USDA as a severe threat to plants are: Soybean Rust, Southern Bacteria Wilt, Plum Pox, Downy Mildew of Corn, Brown Stripe Downey Mildew of Maize, Potato Wart, Bacterial Leaf Streak of Rice, Citrus Greening, and Pierce's Disease.

Radiological terrorism involves the use of radiological dispersal devices or nuclear facilities to attack the population. Exposure to radiation can cause radiation sickness, long-term illness, and even death. Terrorism experts fear the use of explosive and radiological devices in the form of a "dirty bomb" to attack the population. As with chemical and biological events, radiological incidents present contamination challenges for first responders.

Cyber terrorism is the attack or hijack of the information technology infrastructure that is critical to the U.S. economy through financial networks, government systems, mass media, or other systems. Any cyber-attack that creates national unrest or instability would be considered cyber terrorism.

Montana has traditionally attracted activist/extremist individuals and groups because of its low population and large geographic area. Groups active in Montana vary from white supremacists to single issue groups, such as environmental extremists. These groups are attracted to the state and many of them view Montana as their "home", or safe-haven. Because of these views, they commit their illegal activities outside of the state. An example of this would be the Unabomber, Ted Kaczynski. Kaczynski advocated the destruction of technology and the protection of the environment. The Unabomber was responsible for sixteen bombings and three deaths around the United States.

Another example, The World Church of the Creator, which is a white supremacist group with a national following, advocates a "Racial Holy War" against minorities. This group has their national meeting in Superior, Montana once a year. Members of this group have been responsible for numerous homicides in the United States.

Groups such as the Phineas Priesthood of Spokane, WA have used western Montana as a place to hide. The anti-government group, the Freemen, conducted an 81-day standoff with law enforcement in eastern Montana. At the conclusion it was determined they were a "refuge" for individuals around the country involved in criminal anti-government activity. Several of these individuals had spoken about military type action against the current government. Many other organizations besides these that have the potential to use violence exist in parts of Montana and across the country.

Recently, the National Alliance, the largest neo-Nazi organization in the United States, has conducted leafleting campaigns in Southwest Montana and is trying to establish a presence in our communities. This organization has been tied to violent acts throughout the country.

Eco-terrorism is a growing domestic terrorism concern that has been noted in the western United States. The FBI defines eco-terrorism as the use or threatened use of violence of a criminal nature against innocent victims or property by an environmentally-oriented, sub national group for environmental-political reasons, or aimed at an audience beyond the target, often of a symbolic nature. Organizations identified by the FBI as having terrorist cells include the Animal Liberation Front (ALF) and the Earth Liberation Front (ELF). Although supporting organizations generally advocate peaceful demonstrations, the FBI estimates that the ALF/ELF have committed more than 600 criminal acts in the United States from 1996-2001, resulting in damages in excess of \$43 million. The most destructive acts committed by the ALF/ELF involve arson. Many of these attacks have occurred in nearby states such as Washington, Oregon, Utah, Idaho, and Colorado⁵¹. One of the goals of these organizations is to preserve undeveloped lands. With the natural resources that exist in Gallatin County and the potential for future development, this type of terrorism is considered the most likely in Gallatin County.

4.15.2 HISTORY

Fortunately, Gallatin County has not been the target of any major terrorist attacks. Some small, local level events have required a minimal local government response.

4.15.3 PROBABILITY

With very little experience and data locally on this hazard, a specific probability for future terrorism is hard to determine. Based on the historical record and the terrorism threat present for the area, the probability of a large-scale terrorism event is considered low.

4.15.4 MAPPING

The City of Bozeman is the most populous part of Gallatin County. This area, with proximity to hazardous material facilities and government buildings, could be considered the area at greatest risk for terrorism. Domestic and international terrorism can be hard to predict, and therefore, specific targets are not easily identified.

National parks are also considered potential terrorist targets and, therefore, Yellowstone National Park to the south puts Gallatin County communities, particularly West Yellowstone, susceptible to this potential hazard.

4.15.5 ASSOCIATED HAZARDS AND OTHER FACTORS

Any hazard that can be "created" can be the result of terrorism. For example, dam failure can be the result of a terrorist act of compromising the dam. Other examples include communicable disease, aviation, ground, and railroad accidents, hazardous materials release, utility failure, wildfire, and urban fire. All these hazards could be the result of a terrorist act if intentionally triggered.

4.15.6 VULNERABILITY

It is impossible to assess the county's vulnerability to international terrorism. Although extremist groups exist within Montana, it is unlikely that any terrorist act perpetrated by these groups would be of disastrous proportions. Authorities on terrorism generally agree that terrorism cannot be wiped out entirely. For the present, they see it as a problem to be managed, not solved.

4.15.6.1 PROPERTY

Critical facilities in Gallatin County are considered to be at greatest risk from terrorism. Often, terrorists target facilities that are highly important for government services and community stability or are particularly vulnerable. Threat data is not specific enough to identify what facilities are most vulnerable, and therefore, all critical facilities are considered to have the same risk countywide. Those facilities with barriers, security, and other forms of protection are at lower risk. Most facilities in Gallatin County, however, do not have those protections.

Residential structure losses are possible from terrorism, civil unrest, and violence but are not likely. Often the losses are at critical facilities or to the population. Looting, however, can be commonly found in association with these types of events. Therefore, this hazard places both the population and property at risk. Urban areas, places of public gathering, and important government or economic assets are generally going to be the areas of greatest risk. Should an event occur, the losses would likely be moderate.

4.15.6.2 POPULATION

The effects of terrorism, civil unrest, and violence are usually felt by the population. The greatest risk is to human lives during times of unrest. Terrorists typically try to make a dramatic impact that will generate

media interest. Attacking the population through a large loss of life is a common tactic. Therefore, the greatest vulnerability from terrorism is to human life and the economy.

4.15.6.3 ECONOMY

Economic losses will vary dramatically depending upon the incident. Small, isolated incidents are unlikely to have a major impact on the local economy. Large, nationally publicized incidents have the potential to deter tourism.

4.15.6.4 FUTURE DEVELOPMENT

Development should have little to no impact on the terrorism, civil unrest, and violence threat. The exception would be the increase in population and the associated increase of potential losses to life and property within the county. With larger communities around, however, development should have little effect in this regard. Given the goals of eco-terrorists, however, future development could serve as the basis for an event over controversial development.

4.15.7 DATA LIMITATIONS

Since terrorism, civil unrest, and violence are such isolated events and little history exists in Gallatin County, the probability and potential losses are difficult to quantify. Therefore, generalities have been made to estimate where potential losses could be. Site specific surveys would allow for an analysis of weaknesses of critical facilities, infrastructure, and vulnerable populations to terrorism, civil unrest, and violent incidents.

4.15.8 OVERALL HAZARD PROFILE

District / Jurisdiction	Probability of Occurrence	Property Impact	Population Impact	Economic Impact	Overall Risk ¹ (Relative Score) (Range)
Gallatin County	Low	Low	Moderate	Moderate	Low (15) (13-39)
Belgrade	Low	Low	Low	Low	Low (6) (6-38)
Big Sky	Low	Low	Low	Moderate	Low (7) (7-52)
Bozeman	Low	Low	Moderate	Moderate	Low (10) (10-42)
Manhattan/Three Forks	Low	Low	Moderate	Low	Low (9) (6-37)
West Yellowstone	Moderate	Moderate	Moderate	High	Moderate (26) (6-49)

¹ Each jurisdiction (district) determined the hazard's overall risk score by assigning values to ranking metrics that included: 1) probability that the hazard occurs, and 2) potential impacts to property, population and the economy. Criteria for assigning values to the probability and impact metrics and applying weighting factors to the different impact categories can be found in **Section 4.20, Risk Assessment Summary**.

The hazard risk scores for each jurisdiction were consolidated and then averaged to determine an overall risk score at the county level. The countywide risk scores were assigned a risk descriptor (Low, Moderate, High) based on their composite score ranking among all 19 identified hazards and by applying judgment to the final hazard rankings.

4.16 URBAN CONFLAGRATION

4.16.1 DESCRIPTION

From earliest colonial times until the early part of the twentieth century, American cities suffered devastating fires known as conflagrations. These fires grew in destructive power in parallel with the coming of the Industrial Revolution in the early 19th century. By the mid-1920s, however, these city-consuming fires had abated. While large, multi-building fires continued to cause significant damage on

occasion, large-scale fires leveling hundreds, or thousands of structures did not recur. Whether or not an urban fire spreads out of control and envelops large sections of a city is dependent on many factors including construction techniques, building materials, water availability, and local climatology. Recent changes in climate and weather are largely responsible for triggering a new type of urban conflagration that results when extreme wildfire behavior in the wildland-urban interface engulfs communities and causes rapid structure-to-structure ignition.

4.16.2 HISTORY

Within Gallatin County there is limited record of past, large-scale urban fires. In recent history, an urban conflagration-like event that had a lasting impact on the City of Bozeman, was a natural gas explosion and subsequent fire that consumed much of a city block downtown on March 5, 2009. This incident resulted in one fatality and the complete destruction of four downtown businesses and moderate to severe structural damage to numerous buildings. It stands as the largest, urban emergency response (fire, law enforcement, medical) in Gallatin County's history.



Downtown Bozeman explosion, March 5, 2009.
Photo courtesy unknown source.

4.16.3 PROBABILITY AND MAGNITUDE

The probability of a large, urban fire is dependent upon numerous conditions being present to support its initial ignition and continued advancement of the fire. Modern building construction and built-in fire suppression (e.g., sprinklers) greatly reduce the probability of rapid fire expansion in today's urban environment. Of greater concern and probability is the likelihood of a large wildfire overtaking residential areas within the wildland-urban interface (WUI), in a manner similar to recent fire events in northern California. Specific areas of concern for this type of event in Gallatin County include West Yellowstone, Big Sky, and WUI areas along the perimeter of the Gallatin Valley.

4.16.4 MAPPING

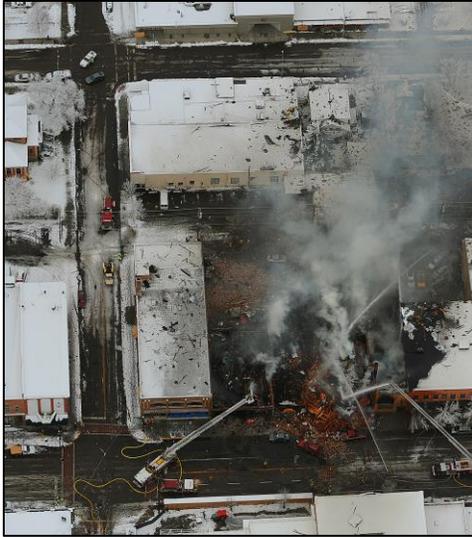
Updated WUI mapping is provided within the Community Wildfire Protection Plan (CWPP) update that accompanies this HMP.

commercial real estate located within the WUI.

4.16.5 VULNERABILITY

4.16.5.1 PROPERTY

Property that is most at-risk from an urban conflagration in Gallatin County are residential and, to a lesser degree,



Downtown Bozeman explosion, March 5, 2009
 Photo courtesy Larry Mayer, Billings Gazette

4.16.5.2 POPULATION

The population exposure to an urban conflagration event is significant, although limited primarily to persons that live and/or work within areas of high wildfire risk.

4.16.5.3 ECONOMY

As with any large-scale fire event, these incidents have the potential to impact not only the immediate area that burns, but also have greater economic impacts via disruption in travel and negative effects on tourism due to smoke and poor air quality.

4.16.5.4 FUTURE DEVELOPMENT

Planning and zoning regulations at the county level can have a significant effect on development, particularly in WUI areas, and can help to reduce the risk of a wildfire having a major impact within residential subdivisions.



Wildfire near Clarkston, MT
 Photo courtesy Montana DNRC.

4.16.6 OVERALL HAZARD PROFILE

District / Jurisdiction	Probability of Occurrence	Property Impact	Population Impact	Economic Impact	Overall Risk ¹ (Relative Score) (Range)
Gallatin County	Moderate	Moderate	Moderate	Moderate	Moderate (21) (13-39)
Belgrade	Low	Low	Low	Moderate	Low (7) (6-38)
Big Sky	Moderate	Moderate	Moderate	Moderate	Moderate (28) (7-52)
Bozeman	Moderate	Moderate	Moderate	Moderate	Moderate (20) (10-42)
Manhattan/Three Forks	Moderate	Moderate	Low	Low	Moderate (18) (6-37)
West Yellowstone	Moderate	Moderate	Moderate	Moderate	Moderate (23) (6-49)

¹ Each jurisdiction (district) determined the hazard's overall risk score by assigning values to ranking metrics that included: 1) probability that the hazard occurs, and 2) potential impacts to property, population and the economy. Criteria for assigning values to the probability and impact metrics and applying weighting factors to the different impact categories can be found in **Section 4.20, Risk Assessment Summary**.

The hazard risk scores for each jurisdiction were consolidated and then averaged to determine an overall risk score at the county level. The countywide risk scores were assigned a risk descriptor (Low, Moderate, High) based on their composite score ranking among all 19 identified hazards and by applying judgment to the final hazard rankings.

4.17 VIOLENCE (VIOLENT ACT / ATTACK)

4.17.1 DESCRIPTION

Violence in the context of an anthropogenic hazard is defined as *the intentional use of physical force or power, threatened or actual, against oneself, another person, or against a group or community, that either results in or has a high likelihood of resulting in injury, death, psychological harm, maldevelopment, or deprivation.*

Violence can also stem from group forms of disorderly conduct such as civil disobedience or unrest and organized protest, all of which generally refer to groups of people purposely choosing not to observe a law, regulation, or rule, usually to bring attention to their cause, concern, or agenda. It may also be defined as acts of violence by assemblages of three or more persons, which cause an immediate danger, or results in damage or injury to the property or person of any other individual.

In recent years, an increase in hate crimes have occurred. Hate crimes occur when a perpetrator targets a victim because of his or her perceived membership in a certain social group. Examples of such groups include but are not limited to racial group, religion, sexual orientation, ethnicity or gender identity. Incidents may involve physical assault, damage to property, bullying, harassment, verbal abuse or insults, or offensive graffiti or letters (hate mail).

Human trafficking is a public health concern that impacts individuals, families, and entire communities across generations. This type of violence is a form of modern slavery. It occurs when a trafficker exploits an individual with force, fraud, or coercion to perform commercial sex or work activities. Targeted individuals are not limited to any class, religious, cultural, or ethnic group. Traffickers can be any gender or age; some are strangers, while others are peers, friends, romantic partners or family members.



From Gallatin County Sheriff's Office

4.17.2 HISTORY

The record of violence and violent acts in Gallatin County is largely limited to statistics of serious felony crimes, or capital crimes, such as murder, kidnapping, and drug trafficking, and rape or sexual assault. The City of Bozeman police department publishes an annual report documenting crimes within city limits. Montana State University (MSU) is required to report annual crime statistics under the Clery Act.

4.17.3 PROBABILITY

The probability of violence targeted against an individual or group of people is difficult to predict and is typically based on previous occurrence of crimes (crime type and location). Training in threat assessment

and situational awareness, along with detection of social behavioral queues, can be used to identify circumstances and environments where an increased probability of violent acts may occur.

The Montana All Threat Intelligence Center's (MATIC) purpose is to collect, store, analyze and disseminate information on public safety issues, including suspected offenses, to the law enforcement community and government officials regarding dangerous drugs, fraud, organized crime, terrorism and other criminal activity for the purposes of decision making, and proactive law enforcement while ensuring the rights and privacy of citizens.

4.17.4 MAPPING

Both the City of Bozeman and MSU periodically publish maps and/or location descriptions where violent crimes have occurred.

4.17.5 ASSOCIATED HAZARDS AND OTHER FACTORS

Both civil unrest and terrorism are hazards that often include violent elements and therefore can be considered associated hazards. Violence can also occur in the aftermath of catastrophic events such as earthquakes, fires, floods, or other critical infrastructure disruptions that cause acute resource shortages.

4.17.6 VULNERABILITY

4.17.6.1 PROPERTY

Residential structures are sometimes the target of violent acts, either through burglary or vandalism. Personal property (vehicles, equipment) are also common targets for violent criminal acts or theft. Commercial property can be targeted for vandalism or theft, occurring both as a principal violent activity, or as a secondary response to another event, such as looting that may follow in the aftermath of a natural disaster. Urban areas, places of public gathering, and important government or economic assets are generally going to be the areas of greatest risk.

4.17.6.2 POPULATION

The effects of violence are often directed at an individual or group of people. The greatest risk is to human lives during times of unrest. Terrorists typically try to make a dramatic impact that will generate media interest. Attacking the population through a large loss of life is a common tactic. Therefore, the greatest vulnerability from terrorism is to human life and the economy.

4.17.6.3 ECONOMY

Measuring the social and economic costs of violence can be difficult, and most estimates only consider the direct economic effects, such as productivity loss or the use of health care services. Communities and societies feel the effects of violence through loss of social cohesion, financial divestment, and the increased burden of the health care and justice systems. Major economic drivers in Gallatin County include MSU and the tourism industry, which both could be negatively impacted by the effects of violence.

4.17.6.4 FUTURE DEVELOPMENT

As communities in the county continue to grow and develop, population will increase and likely become more diverse. An increase in urban-type environments often presents significant risk factors that encourage violence. These risk factors can include gang violence, organized crime, limited government capacity and rising inequality.

4.17.7 OVERALL HAZARD PROFILE

District / Jurisdiction	Probability of Occurrence	Property Impact	Population Impact	Economic Impact	Overall Risk ¹ (Relative Score) (Range)
Gallatin County	Moderate	Low	Moderate	Moderate	Moderate (16) (13-39)
Belgrade	Moderate	Low	Low	Low	Low (12) (6-38)
Big Sky	Moderate	Low	Low	Low	Low (12) (7-52)
Bozeman	Moderate	Low	Low	Low	Low (12) (10-42)
Manhattan/Three Forks	Moderate	Low	Moderate	Low	Moderate (23) (6-37)
West Yellowstone	Moderate	Low	Low	Moderate	Moderate (14) (6-49)

¹ Each jurisdiction (district) determined the hazard's overall risk score by assigning values to ranking metrics that included: 1) probability that the hazard occurs, and 2) potential impacts to property, population and the economy. Criteria for assigning values to the probability and impact metrics and applying weighting factors to the different impact categories can be found in **Section 4.20, Risk Assessment Summary**.

The hazard risk scores for each jurisdiction were consolidated and then averaged to determine an overall risk score at the county level. The countywide risk scores were assigned a risk descriptor (Low, Moderate, High) based on their composite score ranking among all 19 identified hazards and by applying judgment to the final hazard rankings.

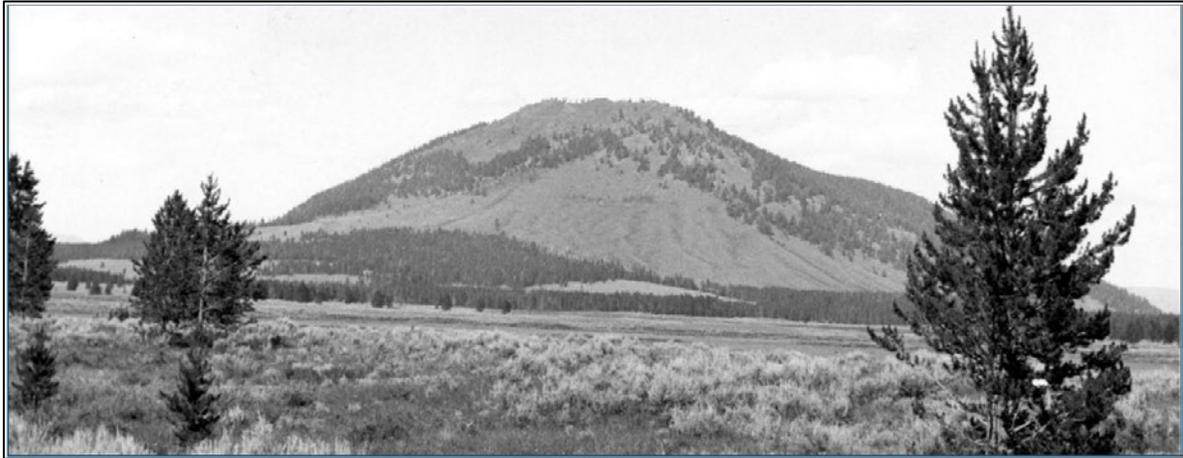
4.18 VOLCANO

4.18.1 DESCRIPTION

Active volcanoes are not known to be present in Gallatin County, but past eruptions have affected the county and possibility of an eruption in nearby Yellowstone National Park is always present. The active volcanic areas in the Cascade Range such as Mount St. Helens, Mount Rainer, and Mount Hood are to the west of Gallatin County and are within the reasonable range of ash fall with the usual upper atmospheric wind patterns. Theoretically, these volcanoes could deposit ash several inches thick over Gallatin County and any large eruption could change the weather patterns experienced globally.

The Yellowstone Caldera, one of the world's largest active volcanic systems, has produced several giant volcanic eruptions in the past few million years, as well as many smaller eruptions and steam explosions. Although no eruptions of lava or volcanic ash have occurred for many thousands of years, future eruptions are likely. Over the next few hundred years, hazards will most likely be limited to ongoing geyser and hot-spring activity, occasional steam explosions, and moderate to large earthquakes. To better understand Yellowstone's volcano and earthquake hazards and to help protect the public, the USGS, the University of Utah, and Yellowstone National Park formed the Yellowstone Volcano Observatory (YVO), which continuously monitors activity in the region.

If a large caldera-forming eruption were to occur at Yellowstone, its effects would be worldwide. Thick ash deposits would bury vast areas of the United States, and injection of huge volumes of volcanic gases into the atmosphere could drastically affect global climate. Fortunately, the Yellowstone volcanic system shows no signs that it is headed toward such an eruption. The probability of a large caldera-forming eruption within the next few thousand years is exceedingly low. Any renewed volcanic activity at Yellowstone would most likely take the form of non-explosive lava eruptions. An eruption of lava could cause widespread havoc in Yellowstone, including fires and the loss of roads and facilities, however more distant areas such as Bozeman would probably remain largely unaffected [USGS, 2005].



Bunsen Peak, Yellowstone Volcano Remnant

Photo courtesy of USGS.

4.18.2 HISTORY

In May 1980, the eruption of Mount St. Helens sent ash high into the atmosphere. Approximately a half an inch of ash fell across Gallatin County. Historical studies have shown that ash from Glacier Peak 11,200 years ago and Mount Mazama 6,600 years ago also fell in Gallatin County.

The Yellowstone region has produced three exceedingly large volcanic eruptions in the past 2.1 million years. In each of these cataclysmic events, enormous volumes of magma erupted at the surface and into the atmosphere as mixtures of red-hot pumice, volcanic ash (small, jagged fragments of volcanic glass and rock), and gas that spread as pyroclastic (“fire-broken”) flows in all directions. Rapid withdrawal of large volumes of magma from the subsurface then caused the ground to collapse, swallowing overlying mountains and creating broad cauldron-shaped volcanic depressions called “calderas.” [USGS, 2005].

4.18.3 PROBABILITY

Volcanic eruptions are rare events when considered in comparison to other hazards measured on the 100-year scale. Scientists evaluate natural-hazard levels by combining their knowledge of the frequency and the severity of hazardous events. In the Yellowstone region, damaging hydrothermal explosions and earthquakes can occur several times a century. Lava flows and small volcanic eruptions occur only rarely - none in the past 70,000 years. Massive caldera-forming eruptions, though the most potentially devastating of Yellowstone’s hazards, are extremely rare - only three have occurred in the past several million years. USGS, University of Utah, and National Park Service scientists with the YVO see no evidence that another such cataclysmic eruption will occur at Yellowstone in the foreseeable future. Recurrence intervals of these events are neither regular nor predictable. **Figure 4-9** shows the probability of the various events that can occur in Yellowstone National Park.

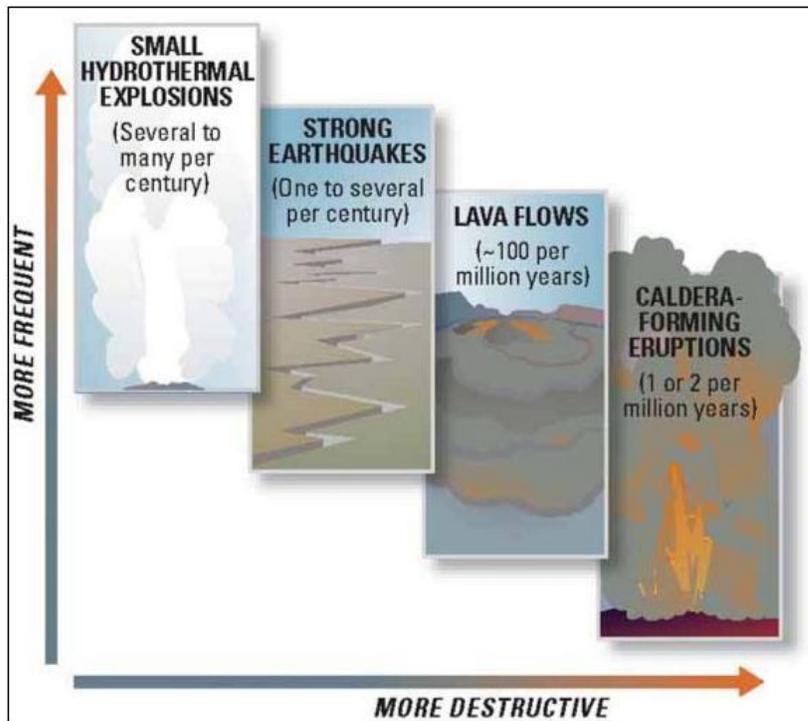


Figure 4-9. USGS Graphic Depicting Recurrence Intervals for Geological Events in Yellowstone National Park

4.18.4 MAPPING

The areas affected by volcanic eruptions are dependent on the type of eruption and the prevailing wind direction. In an actual event, models would be used to predict the areas that would receive ash and other effects from the volcano. Therefore, mapping hazard areas would be broad generalizations and will not be completed here. The county is assumed to have the same risk countywide for a Cascade Range eruption and decreasing risk from south to north for a Yellowstone eruption.

4.18.5 ASSOCIATED HAZARDS AND OTHER FACTORS

Volcanoes, a geological feature, are closely related to earthquake activity. Often eruptions are preceded by earthquake activity as magma moves below the surface. The two events are usually closely linked and monitored. Other factors that become important during a volcanic eruption include wind speed, direction, and rainfall. The wind speed and direction will dictate when and where ash falls. Dry ash is manageable, but when combined with rainfall, the ash becomes glue-like and much more difficult to control.

4.18.6 VULNERABILITY

4.18.6.1 PROPERTY

All critical facilities are at risk from volcanic eruptions. The impact on the facilities will depend on the amount of ash that falls and the ability to remove it. Significant amounts of ash have the potential to clog air systems and shut down facilities. Given enough wet, heavy ash, the potential exists for roofs to fail. Infrastructure exposed to the ash fall, such as power systems, could be brought down by the ash as well. The removal of ash from government facilities and infrastructure can potentially create costs beyond the community's capabilities. Thus, all critical facilities and vulnerable populations are exposed to ash fall.

During Mount St. Helens' 1980 eruption, the greatest costs came from the difficult task of removing volcanic ash. The greatest threat is not necessarily to people or residences but to property such as vehicles and equipment. The volcanic dust is corrosive to metals and without proper removal can certainly cause damages to public and private property. In a Yellowstone eruption, the potential for heavy, wet ash could threaten structures by collapsing roofs. The probability of an event of this magnitude is very low. The economy, and particularly tourism, could be severely affected if an eruption occurs or is imminent.

4.18.6.2 POPULATION

Light ash fall does not significantly impact the population if those with respiratory sensitivities remain indoors. Ash fall conditions that exist for several days, however, could lead to significant health problems for many in Gallatin County. The extremely rare major Yellowstone eruption could lead to deaths to those close to the Park from pyroclastic flows and extreme amounts of falling ash. The degree of population impacts will greatly vary depending on the type of event.

4.18.6.3 ECONOMY

The tourist economy could be severely impacted should a volcanic eruption occur or become imminent. Ashfall may cause plane transportation services to be delayed or cancelled, further reducing tourism to the area. Significant ashfall can harm crops and livestock and impact the local agricultural economy.

4.18.6.4 FUTURE DEVELOPMENT

Future development will have little to no effect on the volcano hazard. New development will be exposed to the volcano hazards of Gallatin County and increase the population and property values at risk.

4.18.7 DATA LIMITATIONS

Volcanic eruptions that affect Gallatin County are so extremely rare that documenting the potential impacts and probability is very limited. Continued study of the Yellowstone caldera and other volcanic areas will hopefully allow scientists, and therefore emergency managers, to better understand this hazard.

4.18.8 OVERALL HAZARD PROFILE

District / Jurisdiction	Probability of Occurrence	Property Impact	Population Impact	Economic Impact	Overall Risk ¹ (Relative Score) (Range)
Gallatin County	Low	Moderate	Moderate	Moderate	Low (13) (13-39)
Belgrade	Low	Moderate	Moderate	Moderate	Low (12) (6-38)
Big Sky	Low	High	Moderate	High	Low (15) (7-52)
Bozeman	Low	Moderate	Moderate	Moderate	Low (12) (10-42)
Manhattan/Three Forks	Low	Moderate	Moderate	Moderate	Low (13) (6-37)
West Yellowstone	Low	Moderate	Moderate	Moderate	Low (12) (6-49)

¹ Each jurisdiction (district) determined the hazard's overall risk score by assigning values to ranking metrics that included: 1) probability that the hazard occurs, and 2) potential impacts to property, population and the economy. Criteria for assigning values to the probability and impact metrics and applying weighting factors to the different impact categories can be found in **Section 4.20, Risk Assessment Summary**.

The hazard risk scores for each jurisdiction were consolidated and then averaged to determine an overall risk score at the county level. The countywide risk scores were assigned a risk descriptor (Low, Moderate, High) based on their composite score ranking among all 19 identified hazards and by applying judgment to the final hazard rankings.

4.19 WILDFIRE

As part of the update process for this HMP, Gallatin County has concurrently updated its Community Wildfire Protection Plan (CWPP). The updated CWPP is integrated with this HMP document and included herein as Attachment A. Stakeholders specifically involved with the Wildfire hazard and its associated risks and vulnerability are encouraged to review the updated CWPP for more detailed information.

4.19.1 DESCRIPTION

Wildland fires are a part of nature in the mountainous, forested areas and arid grasslands of Montana. Gallatin County has both broad areas of National Forest and dry open fields. Forest fires can travel quickly through the crowns of trees or spread along the forest floor. Grass fires are common in non-irrigated fields and open areas scattered with sage brush and native grasses due to the arid climate during almost any season but winter. Both types of wildfires can be aggravated by exceptionally windy conditions that often occur in parts of the county.

A wildland fire can be categorized as either an uncontrolled fire in a forested/heavily vegetated area or in a grass/brush area. Both types of wildfires have the potential to destroy structures and affect natural resources while producing heavy amounts of smoke. Wildfires can be caused by any ignition source but are most often triggered by lightning, human carelessness, arson, or sparks emanating from machinery or equipment (i.e., trains, farm implements). Once triggered, the ambient conditions dictate whether the fire will spread. Moist, cool, calm conditions or low fuels will aid in suppressing the fire, whereas dry, warm, windy conditions or heavy fuels will contribute to fire spread. The natural environment has evolved to live with fire. New growth can occur in only a few years and some species require fire to grow.

Problems with wildfire occur when combined with the human environment. People and structures near wildfires are threatened unless adequately protected through evacuation or mitigation. Most structures are flammable and, therefore, threatened when wildfire approaches. In addition, a significant loss of life could occur with residents who do not evacuate, firefighters, and others who are in the wildfire area. Infrastructure such as electric transmission lines, fuel tanks, and radio transmission towers are usually not equipped to withstand the heat from a wildfire. Timber resources, animal habitats, and waterways can all be damaged leading to negative economic and environmental impacts. The area where human development meets undeveloped, vegetated lands is called the Wildland-Urban Interface (WUI).

Gallatin County is regularly threatened by wildfires because of the terrain, climate conditions, and fuels present. A significant portion of the land area in Gallatin County is under federal and state government ownership. Parts of the Custer-Gallatin National Forest and Yellowstone National Park lie within the county boundaries. The US Bureau of Land Management manages numerous parcels within the county as well.

Fuels in Gallatin County range from dense timber stands in varying terrain to native grasslands. Douglas fir, lodgepole pine, Engelmann spruce, sagebrush, rough fescue, and other grasses make up many of the wildland fuels in the county. Periods of drought, disease, insect infestations, and low fire activity or mitigation can all lead to an increase in hazardous fuels.

4.19.2 HISTORY

Gallatin County has a long history of wildfires from small to large. The extent of damages often depends on the proximity to the WUI, fire spread rates, and the effectiveness of suppression and mitigation measures. The history of wildfires can be difficult to compile because the various firefighting entities involved and a variety of recordkeeping measures over the years. The following list chronicles several of the critical / severe wildfire events that have occurred in the county over the last 30 years.

June – November, 1988 - Greater Yellowstone Fires. Numerous fires throughout Yellowstone National Park raged through the entire summer and well into the fall of 1988. Some of these fires extended into portions of Gallatin County. The fires covered 2.3 million acres, employed an estimated 25,000 firefighters, and cost nearly \$120 million for fire suppression. One firefighter and one pilot were killed, and structure losses were estimated at \$3 million, mostly within Yellowstone National Park.

August 2001 – Fridley Fire. Lightning ignited the Fridley Fire on August 19 near Fridley Creek in the Custer-Gallatin National Forest. The fire doubled in size on August 22 and displayed "extreme" behavior on August 23, when high winds caused it to double in size again. Montana Executive Order 20-01, issued on August 25, 2001, declared a state of emergency in Gallatin County and other locations across the state and mobilized state resources and the National Guard to fight the wildfires. On August 31, three members of a firefighting helicopter crew were killed on a maintenance flight when a bucket line tangled with a rotor, causing the helicopter to crash three miles south of Emigrant in Park County. The Fridley Fire was contained on September 13, 2001. In all, 26,373 acres burned from this fire and firefighting costs totaled over \$11 million with 1,261 personnel, 50 pieces of heavy equipment, and 14 helicopters used. Fortunately, no structures were lost. This was a significant fire for Gallatin County because the City of Bozeman watershed, which is the primary the drinking water supply for the city, was threatened.



Bridger Foothills Fire, September 2020. Photo courtesy Don Seifert.

September 2001 - Purdy Fire. Following the Fridley Fire by just a few weeks, the Purdy Fire ignited on September 26th in the upper Wilson Creek drainage southeast of Gallatin Gateway. By September 28, the fire had burned over 4,000 acres and caused the evacuation of over 50 homes.

September 2009 - Flaming Arrow Fire. Winds re-ignited the remnants of a controlled burn into a fast-moving grass fire in the Flaming Arrow subdivision just south of Bridger Bowl. The fire burned mostly on private land and threatened about 25 homes. The fire was 100 percent contained after burning approximately 250 acres over a four-day period.

June 2012 - Bear Trap Fire. A human-caused fire that was later determined to be arson, burned 15,500 acres in the Bear Trap Canyon area along the Madison River west of Bozeman. The estimated value of property lost in the fire, including one home, crops, pastures, fences, a vehicle, eight horses and electrical transmission lines totaled more than \$3.8 million. Approximately \$1.25 million was spent in suppression costs and involved over 200 firefighters.

August – September 2012 – Millie Fire. Burned 10,515 acres in the Storm Castle Creek drainage, approximately 20 miles southwest of Bozeman. The fire was not fully contained for nearly one month, and initially threatened to cross over into the Hyalite Creek drainage where it could potentially have affected a drinking water source for the City of Bozeman as well as other impacts to the heavily used Hyalite Reservoir recreation area. The fire caused closures of Hyalite Canyon, Leverich Canyon, and Sourdough Canyon (Bozeman Creek) for much of its duration.

October 2015 - Cottonwood Gulch Fire. This fire was accidentally started by a landowner's vehicle in the Cottonwood Gulch area north of Manhattan. The fire burned approximately 8,300 acres and one outbuilding before being fully contained.

August 2016 -Maple Fire. The Maple Fire was detected on the evening of August 8, 2016 by smokejumper aircraft flying over Yellowstone. The cause was determined to be lightning. The southwest perimeter of the fire burned within 3.5 miles of West Yellowstone. Over 230 personnel were assigned to the fire at its peak. The fire burned over 41,000 acres of timber and short grass.

July – October 2018 – Bacon Rind Fire. The Bacon Rind Fire was detected on July 20th and continued to burn for over two months at varied intensity with the main objective of restoring fire to the landscape. The 5,232-acre fire was located approximately 20 miles south of Big Sky along the west side of Highway 191, within both Yellowstone National Park and CGNF-Lee Metcalf Wilderness. There were no structures threatened or lost due to coordination with Gallatin County and local fire departments.

September 2018 - Horseshoe Fire. This fire burned 1,223 acres in the Horseshoe Hills east of Clarkston. The fire began on Monday afternoon, Sept. 10th and was declared 100% contained on Saturday, Sept. 15th. Several structures were lost to this fire including three primary residences, two secondary residences, and several outbuildings [GCEM website, Horseshoe Fire Update, 9/14/18 – 9:30am].

September 2020 – Bridger Foothills Fire. This fire burned 8,224 acres in Bridger Canyon North of Bozeman. The fire began on September 4th and was declared 100% contained on October 12th. 30 primary residences, one commercial building and numerous outbuildings were destroyed.

4.19.3 PROBABILITY

The probability of wildland fires to occur in Gallatin County is considered high. As Gallatin County continues to grow and more and more of the population begins to recreate in the national forests, the potential for fire starts increases. Combine this with the normal natural causes of fire such as lightning, and Gallatin County can expect to see significant fires in the future.

4.19.4 ASSOCIATED HAZARDS AND OTHER FACTORS

As if a raging wildfire isn't bad enough, the charred ground and thick smoke plumes it produces can create other hazards. The heavy smoke produced by a wildfire can cause unhealthy air conditions that may affect those with respiratory problems and otherwise healthy people. The air conditions are often monitored, and alerts may be issued. Smoky conditions can also lead to poor visibility and an

increased probability of ground transportation or aircraft accidents. Besides air pollution, water pollution may occur during and after a wildfire. Many watersheds in wildland areas serve as public water supplies for area communities. Should a moderate to high intensity fire pass through the area, pollution of the watershed can occur. With

vegetation removed and the ground seared from a wildfire, the area also becomes more prone to flash floods and landslides because of the ground's reduced ability to hold water.

Aerial fire suppression with Sikorsky S-64 "Skycrane" helicopter.
Photo courtesy Jason Revisky.



4.19.5 VULNERABILITY

4.19.5.1 PROPERTY

Critical facilities set in wildland areas can be particularly problematic during fires. Electric and communications infrastructure, including major regional electric transmission lines and public safety communications sites, are located in forested, wildland areas within Gallatin County. This infrastructure is highly vulnerable to wildland fire in the absence of mitigative efforts.

Within Gallatin County, wildfires have the greatest potential to substantially burn National Forest and National Park acreage, however, private residences become threatened when the fire enters the WUI. Gallatin County has many WUI areas that may be threatened should a wildfire encroach. The Gallatin County CWPP, which is an Attachment to this HMP document, provides an accurate and detailed assessment of the risks and potential losses from this hazard.

Ongoing development within Gallatin County, and particularly within WUI Intermix areas, has substantially increased the level of vulnerability to the wildfire hazard, both to population and to property. Between 1990 and 2016, 430 new homes were built in Gallatin County in areas of high wildfire hazard, and 1,910 new homes were built in areas of moderate wildfire hazard (Headwaters Economics, June 2018).



Structure loss assessment following wildfire.
Photo courtesy Gallatin County Emergency Management

Although the primary concern is to structures and residents, most of the costs associated with fires, come from firefighting and suppression efforts. Additional losses to natural resources, water supplies, air quality, and the economy are also typically found. As past events have shown, infrastructure such as

power transmission lines can be threatened. Wildfires can also have a significant impact on the regional economy with the loss of timber, natural resources, recreational opportunities, and tourism, all of which are important in Gallatin County.

4.19.5.2 POPULATION

Using the estimate of 79 structures affected in a major wildfire from the Potential Losses section, roughly 150 people would live in the affected area (79 structures x 1.9 people/structure). In many cases, residents can be evacuated before the fire moves into their area. Some residents, however, may choose to remain in the evacuated area, or a rapidly spreading fire may not allow enough time for a formal evacuation. Firefighters can be particularly threatened during wildfires. Advances in firefighter safety and technology have improved firefighting efforts, however, the potential for loss of life and injuries still exists. For these reasons, the impact on the population can be considered moderate.

4.19.5.3 ECONOMY

Wildfire suppression and control can be extremely costly, depending on the nature of the fire. Additionally, fires can depress tourism, which is a significant economic driver in Gallatin County.

4.19.5.4 FUTURE DEVELOPMENT

The wildland/urban interface is a very popular place to live as national trends show. More and more homes are being built in the WUI and Gallatin County is no exception. Development in high and moderate wildfire hazard areas has increased in recent years and has amplified the vulnerabilities in the unincorporated parts of Gallatin County, particularly areas mapped as WUI Intermix (refer to Attached CWPP). Regulating growth in these areas is a balance between protecting private property rights and promoting public safety. The Gallatin County Growth Policy and Subdivision Regulations recognize the wildfire threat, emphasizing defensible space, new development inspection, water supplies, and fuels management and mitigation.



Mt. Ellis area southeast of Bozeman – an example of WUI Intermix. Photo courtesy M. Rotar

4.19.6 DATA LIMITATIONS

With an understanding of the components that contribute to wildfire risk and application of a coordinated and collaborative planning effort, Gallatin County and other stakeholders can take steps to influence each component of wildfire risk in different ways. The importance of high quality, current risk assessment information is critical to the success of this planning effort. Data used in the risk assessment must have adequate quality and resolution to facilitate accurate modeling of the risks. Assessment of wildfire risk

also requires detailed, accurate information on development patterns in the WUI, changes in fire suppression resources and methods, and the effects of recent fires. The following steps could be taken to improve the risk assessment analysis and information:

1. Resulting landscape changes from recent wildfire seasons (2017 and later) could be incorporated into an updated wildfire risk assessment. This would require extensive field work and data analysis.
2. Compile parcel-level assessment data to inform and complete risk assessment, increase first responder information, and encourage public engagement. Parcel-level assessment data would not only provide the susceptibility information required for a complete risk assessment, but also provide valuable information for fire districts and residents to guide private property mitigation efforts.

The attached CWPP document (Attachment A) provides additional detail on potential actions that could be taken to improve data quality and resolution to facilitate accurate wildfire modeling and risk assessment.

4.19.7 OVERALL HAZARD PROFILE

District / Jurisdiction	Probability of Occurrence	Property Impact	Population Impact	Economic Impact	Overall Risk ¹ (Relative Score) (Range)
Gallatin County	High	High	Moderate	Moderate	High (39) (13-39)
Belgrade	High	Moderate	Moderate	Moderate	High (30) (6-38)
Big Sky	High	High	High	High	High (52) (7-52)
Bozeman	High	Moderate	Moderate	Moderate	High (36) (10-42)
Manhattan/Three Forks	High	Moderate	Moderate	Moderate	High (36) (6-37)
West Yellowstone	High	High	High	High	High (49) (6-49)

¹ Each jurisdiction (district) determined the hazard's overall risk score by assigning values to ranking metrics that included: 1) probability that the hazard occurs, and 2) potential impacts to property, population and the economy. Criteria for assigning values to the probability and impact metrics and applying weighting factors to the different impact categories can be found in **Section 4.20, Risk Assessment Summary**.

The hazard risk scores for each jurisdiction were consolidated and then averaged to determine an overall risk score at the county level. The countywide risk scores were assigned a risk descriptor (Low, Moderate, High) based on their composite score ranking among all 19 identified hazards and by applying judgment to the final hazard rankings.

4.20 RISK ASSESSMENT SUMMARY

This risk assessment represents an approximate history of estimated vulnerabilities to the communities from the hazards identified. As with any assessment involving natural or human-caused hazards, all potential events may not be represented herein, and an actual incident may occur in a vastly different way than described. This assessment, however, will be used where possible to minimize damages from these events in the future.

Every type of event is different, with impacts ranging in severity to population, property or the economy. Incidents have different probabilities and magnitudes even within hazards. For example, a small earthquake will be different than a large earthquake and a moderate flood will be different from both of those. Furthermore, each participating district/jurisdiction has differing degrees of risk exposure and vulnerability to a given hazard compared to the overall county. Therefore, each district conducted a hazard ranking exercise for their community using the same methods which ensures consistency in the overall risk assessment process.

4.20.1 HAZARD RANKING METHODOLOGY

The methodology used to rank the identified hazards for each district/jurisdiction is described below. Estimates of risk for Gallatin County were developed using methodologies promoted by FEMA's hazard mitigation planning guidance and generated by FEMA's HAZUS-MH risk assessment tool.

4.20.1.1 PROBABILITY OF OCCURRENCE

The probability of occurrence is an estimate of how often a hazard event occurs. A review of historic events assists with this determination. Each hazard of concern is rated in accordance with the numerical ratings and definitions in **Table 4-16**.

Table 4-16. Probability of Hazard Occurrence - Ranking Factors

Rating (Value)	Probability	Definition
0	None	Hazard event is not likely to ever occur
1	Rare	Hazard event is not likely to occur within 100 years
2	Occasional	Hazard event is likely to occur within 100 years
3	Frequent	Hazard event is likely to occur within 25 years

4.20.1.2 IMPACT

The impact of each hazard is considered in three categories: impact on population, impact on property, and impact on the economy. Based on documented historic losses and a subjective assessment by persons attending the district ranking meetings, an impact rating of high, moderate, or low is assigned with a corresponding numeric value for each hazard of concern. In addition, a weighting factor is assigned to each impact category: three (3) for population, two (2) for property, and one (1) for economy. This gives the impact on population the greatest weight in evaluating the impact of a hazard.

Table 4-17 presents the numerical rating, weighted factor and description for each impact category. The impact rating definitions for population and property are consistent with the FEMA hazard mitigation methodology. Impact to the economy is also evaluated.

Table 4-17. Numerical Values and Definitions for Impacts on Population, Property, and Economy

Category	Weighting Factor	Low Impact (1)	Moderate Impact (2)	High Impact (3)
Population	3	14% or less of developed land area in the district is exposed to a hazard due to its extent and location	15% - 29% of developed land area in the district is exposed to a hazard due to its extent and location	30% or more of developed land area in the district is exposed to a hazard due to its extent and location
Property	2	Property exposure is 14% or less of the total replacement cost for your community	Property exposure is 15% - 29% less of the total replacement cost for your community	Property exposure is 30% or more of the total replacement cost for your community
Economy	1	Loss estimate is 9% or less of the total replacement cost for your community	Loss estimate is 10% - 19% of the total replacement cost for your community	Loss estimate is 20% or more of the total replacement cost for your community

4.20.1.3 RISK RANKING VALUE

The risk ranking for each hazard is then calculated by multiplying the numerical value for probability of occurrence by the sum of the numerical values for impact. The equation is as follows:

Probability of Occurrence (1, 2, or 3) x Sum of Impact Values (6 to 18) = Hazard Ranking Value.

Based on the total for each hazard, a priority ranking is assigned to each hazard of concern (high, moderate, or low).

The Relative Overall Risk scores for identified hazards were determined within each district. Based on the numeric range of calculated risk scores (high to low), the hazards were initially grouped into categories of High, Moderate, and Low according to the following:

Risk Score (0 - 19):	Low
Risk Score (20 - 39):	Moderate
Risk Score (40 & over):	High

The preliminary ranking categories were reviewed by meeting attendees and suggestions for category adjustments to individual hazard rankings were considered, as appropriate.

Hazard rankings were carried forward from each of the five districts/jurisdictions to develop a countywide ranking of hazards. In general, risk scores for a given hazard were averaged for determination of a countywide risk score, subject to minor modifications by the HMP update contractor. Where a particular hazard was identified only in one or two districts (e.g., Channel Migration Mapping; District 3 – Bozeman), it was typically not evaluated further. Some exceptions to this included consideration of the Cyber-security hazard identified in Districts 1 & 3 as part of Critical Infrastructure Disruption, and the Active Killer/Shooter hazard identified in Districts 3 & 5 as it related to both the Terrorism and Violence hazards. Final hazard rankings for Gallatin County were presented at a public meeting on January 22, 2019. **Table 4-18** presents the hazard rankings and the corresponding risk score values.

Table 4-18. Gallatin County Hazard Summary

Hazard	Probability of Occurrence	Property Impact	Population Impact	Economic Impact	Relative Overall Risk (Score)
Wildfire	High	High	Moderate	Moderate	High (39)
Drought	High	Moderate	Moderate	Moderate	High (34)
Earthquake	Moderate	Moderate	High	Moderate	High (32)
Critical Infrastructure Disruption	Moderate	Moderate	High	Moderate	High (32)
Severe Weather	Moderate	Moderate	Moderate	Moderate	High (31)
Environmental Hazards	Moderate	Moderate	Moderate	Moderate	Moderate (26)
Flooding	Moderate	Moderate	Moderate	Moderate	Moderate (26)
Communicable Disease and Bioterrorism	Moderate	Low	Moderate	Moderate	Moderate (25)
Hazardous Materials Release	Moderate	Low	Moderate	Moderate	Moderate (23)
Ground Transportation Accident	High	Low	Low	Low	Moderate (23)
Urban Conflagration	Moderate	Moderate	Moderate	Moderate	Moderate (21)
Avalanche and Landslide	Moderate	Low	Low	Low	Moderate (16)
Civil Unrest	Moderate	Low	Moderate	Moderate	Moderate (16)
Violence	Moderate	Low	Moderate	Moderate	Moderate (16)
Dam Failure	Low	Moderate	Moderate	Moderate	Low (15)
Terrorism	Low	Low	Moderate	Moderate	Low (15)
Aviation Accident	Moderate	Low	Low	Low	Low (15)
Volcano	Low	Moderate	Moderate	Moderate	Low (13)
Railroad Accident	Moderate	Low	Low	Low	Low (13)

Following the countywide hazard summary, **Tables 4-19 to 4-23** provide hazard summaries for each of the five districts evaluated. For more information on the determinations, refer to the individual hazard profiles.

Table 4-19. Belgrade Hazard Summary (District 4)

Hazard	Probability of Occurrence	Property Impact	Population Impact	Economic Impact	Relative Overall Risk (Score)
Drought	High	Moderate	High	Moderate	High (38)
Severe Weather	High	Moderate	High	Moderate	High (36)
Critical Infrastructure Disruption	Moderate	Moderate	High	High	High (36)
Earthquake	Moderate	High	High	High	High (33)
Environmental Hazards	High	Moderate	Moderate	Moderate	High (33)
Wildfire	High	Moderate	Moderate	Moderate	High (30)
Flooding	High	Moderate	Moderate	Moderate	High (30)
Communicable Disease and Bioterrorism	Moderate	Low	High	Moderate	Moderate (19)
Railroad Accident	Moderate	Low	Moderate	Low	Moderate (18)
Hazardous Materials Release	Moderate	Low	Moderate	Moderate	Moderate (18)
Aviation Accident	Moderate	Low	Low	Moderate	Moderate (16)
Ground Transportation Accident	Moderate	Low	Low	Low	Moderate (16)
Community Resilience	Low	Moderate	Moderate	High	Moderate (13)

Hazard	Probability of Occurrence	Property Impact	Population Impact	Economic Impact	Relative Overall Risk (Score)
Violence	Moderate	Low	Low	Low	Moderate (13)
Avalanche and Landslide	Moderate	Low	Low	Low	Low (12)
Dam Failure	Low	Moderate	Moderate	Moderate	Low (12)
Volcano	Low	Moderate	Moderate	Moderate	Low (12)
Civil Unrest	Low	Low	Moderate	Moderate	Low (10)
Urban Conflagration	Low	Low	Low	Moderate	Low (7)
Terrorism	Low	Low	Low	Low	Low (6)

Table 4-20. Big Sky Hazard Summary (District 2)

Hazard	Probability of Occurrence	Property Impact	Population Impact	Economic Impact	Relative Overall Risk (Score)
Wildfire	High	High	High	High	High (52)
Limited Access	High	Moderate	High	High	High (35)
Critical Infrastructure Disruption	Moderate	Moderate	High	Moderate	High (35)
Ground Transportation Accident	High	Low	Moderate	Moderate	High (32)
Mass Casualty Incident	High	Low	Moderate	Moderate	High (30)
Hazardous Materials Release	High	Low	Moderate	Moderate	High (30)
Drought	Moderate	Moderate	Moderate	Moderate	Moderate (29)
Earthquake	Moderate	Moderate	Moderate	Moderate	Moderate (28)
Urban Conflagration	Moderate	Moderate	Moderate	Moderate	Moderate (28)
Severe Weather	Moderate	Moderate	Moderate	Moderate	Moderate (28)
Avalanche and Landslide	High	Low	Moderate	Low	Moderate (27)
Communicable Disease and Bioterrorism	Moderate	Low	High	Moderate	Moderate (23)
Environmental Hazards	Moderate	Moderate	Moderate	Moderate	Moderate (21)
Flooding	Moderate	Low	Moderate	Moderate	Moderate (20)
Civil Unrest	Moderate	Low	Moderate	Moderate	Moderate (20)
Volcano	Low	High	Moderate	High	Low (15)
Dam Failure	Moderate	Low	Low	Moderate	Low (14)
Aviation Accident	Moderate	Low	Low	Low	Low (12)
Violence	Moderate	Low	Low	Low	Low (12)
Terrorism	Low	Low	Low	Moderate	Low (7)

Table 4-21. Bozeman Hazard Summary (District 3)

Hazard	Probability of Occurrence	Property Impact	Population Impact	Economic Impact	Relative Overall Risk (Score)
Drought	High	Moderate	High	Moderate	High (42)
Severe Weather	High	Moderate	High	Moderate	High (37)
Wildfire	High	Moderate	Moderate	Moderate	High (36)
Critical Infrastructure Disruption	Moderate	Moderate	High	Moderate	High (34)
Environmental Hazards	High	Moderate	High	Moderate	High (34)
Earthquake	Moderate	High	High	High	High (34)
Flooding	High	Moderate	Moderate	Moderate	High (33)
Communicable Disease and Bioterrorism	Moderate	Low	High	High	High (28)
Cyber Security	Moderate	Low	Moderate	Moderate	Moderate (24)
Hazardous Materials Release	Moderate	Low	Moderate	Moderate	Moderate (22)
Ground Transportation Accident	High	Low	Low	Low	Moderate (20)
Urban Conflagration	Moderate	Moderate	Moderate	Moderate	Moderate (20)
Civil Unrest	Moderate	Low	Moderate	Moderate	Moderate (20)
Avalanche and Landslide	High	Low	Low	Low	Moderate (18)
Dam Failure	Low	High	High	Moderate	Moderate (17)
Railroad Accident	Moderate	Low	Low	Low	Moderate (16)
Channel Migration	Moderate	Low	Low	Low	Moderate (15)
Mass Casualty Incident	Moderate	Low	Moderate	Low	Moderate (15)
Violence	Moderate	Low	Low	Low	Moderate (15)
Volcano	Low	Moderate	Moderate	Moderate	Low (12)
Aviation Accident	Moderate	Low	Low	Low	Low (12)
Active Killer	Low	Low	Low	Low	Low (11)
Terrorism	Low	Low	Moderate	Moderate	Low (10)

Table 4-22. Manhattan and Three Forks Hazard Summary (District 5)

Hazard	Probability of Occurrence	Property Impact	Population Impact	Economic Impact	Relative Overall Risk (Score)
Drought	High	Moderate	Moderate	Moderate	High (37)
Severe Weather	High	Moderate	Moderate	Moderate	High (37)
Wildfire	High	Moderate	Moderate	Moderate	High (36)
Flooding	High	Moderate	Moderate	Moderate	High (30)
Environmental Hazards	High	Moderate	Moderate	Moderate	Moderate (28)
Earthquake	Moderate	Moderate	High	Moderate	Moderate (28)
Critical Infrastructure Disruption	Moderate	Moderate	Moderate	Moderate	Moderate (25)
Communicable Disease and Bioterrorism	Moderate	Moderate	Moderate	Moderate	Moderate (24)
Opioid Addiction	High	Low	Moderate	Low	Moderate (24)

Hazard	Probability of Occurrence	Property Impact	Population Impact	Economic Impact	Relative Overall Risk (Score)
Hazardous Materials Release	Moderate	Moderate	Moderate	Moderate	Moderate (23)
Violence	Moderate	Low	Moderate	Low	Moderate (23)
Mental Health	High	Low	Low	Low	Moderate (22)
Ground Transportation Accident	High	Low	Low	Low	Moderate (21)
Urban Conflagration	Moderate	Moderate	Low	Low	Moderate (18)
Aviation Accident	Moderate	Low	Low	Low	Moderate (17)
Active Shooter	Moderate	Low	Low	Low	Moderate (16)
Dam Failure	Low	Moderate	Moderate	Moderate	Moderate (15)
Railroad Accident	Moderate	Low	Low	Low	Moderate (14)
Volcano	Low	Moderate	Moderate	Moderate	Low (13)
Civil Unrest	Moderate	Low	Low	Low	Low (12)
Terrorism	Low	Low	Moderate	Low	Low (9)
Avalanche and Landslide	Low	Low	Low	Low	Low (6)

Table 4-23. West Yellowstone Hazard Summary (District 1)

Hazard	Probability of Occurrence	Property Impact	Population Impact	Economic Impact	Relative Overall Risk (Score)
Wildfire	High	High	High	High	High (49)
Earthquake	High	High	High	High	High (48)
Critical Infrastructure Disruption	High	Moderate	High	High	High (47)
Severe Weather	High	Moderate	High	Moderate	High (45)
Ground Transportation Accident	High	Low	Moderate	Moderate	Moderate (30)
Communicable Disease and Bioterrorism	Moderate	Low	High	High	Moderate (30)
Cyber Security	High	Low	Moderate	Moderate	Moderate (29)
Terrorism	Moderate	Moderate	Moderate	High	Moderate (26)
Hazard Materials Release	Moderate	Moderate	Moderate	Moderate	Moderate (24)
Urban Conflagration	Moderate	Moderate	Moderate	Moderate	Moderate (23)
Civil Unrest	Moderate	Moderate	Moderate	Moderate	Moderate (21)
Environmental Hazards	Moderate	Moderate	Moderate	Moderate	Moderate (20)
Drought	Moderate	Low	Moderate	Moderate	Moderate (19)
Violence	Moderate	Low	Low	Moderate	Moderate (19)
Aviation Accident	Moderate	Low	Low	Low	Low (12)
Volcano	Low	Moderate	Moderate	Moderate	Low (12)
Avalanche and Landslide	Moderate	Low	Low	Low	Low (12)
Dam Failure	Low	Low	Low	Moderate	Low (7)
Flooding	Low	Low	Low	Low	Low (6)

5.0 MITIGATION STRATEGY

Hazard mitigation, as defined by the Disaster Mitigation Act of 2000, is any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards. The development of a mitigation strategy allows the community to create a vision for preventing future disasters, establish a common set of mitigation goals, prioritize actions, and evaluate the success of such actions.

The Gallatin County Mitigation Strategy is based on the results of the risk assessment and recommendations by knowledgeable community members through the All Hazards All Discipline (AHAD) Group and public meetings. The overarching mission of this mitigation strategy is to:

- / ***Reduce or prevent losses from disasters.***

Rather than wait until a disaster occurs, Gallatin County, the City of Bozeman, the City of Belgrade, the City of Three Forks, the Town of West Yellowstone, and the Town of Manhattan, have developed this strategy to move in a proactive direction in disaster prevention. All losses cannot be entirely mitigated, however, some actions can be taken, as funding and opportunities arise, that may reduce the impacts of disasters and eventually save taxpayers' money. The mitigation actions were developed based on direct input from the community and prioritized through a multi-step process.

5.1 GOALS AND OBJECTIVES

Goals were defined for the purpose of this HMP update as broad-based, public policy statements that:

- / Represent basic desires of the community;
- / Encompass all aspects of community, public and private;
- / Are non-specific, referring to the quality (not the quantity) of the outcome;
- / Are future-oriented, and thus achievable in the future; and
- / Are time-independent, meaning they are not scheduled events.

Goals are stated without regard for implementation; that is, implementation cost, schedule, and means are not considered. Goals are defined before considering how to accomplish them so that the goals are not dependent on the means of achievement. Goal statements form the basis for objectives and actions that will be used as conduits to achieve the goals. Objectives define strategies to attain the goals and are more specific and measurable. Mitigation actions are specific actions that help achieve the goals and objectives of the plan.

To facilitate the update of this plan, stakeholders reviewed the list of goals from the 2012 Gallatin County HMP. This review was completed to ensure that the updated mitigation strategy represented a logical progression of the mitigation strategies and implementation plans developed in previous versions of the HMP (2006, 2012). Stakeholders could use, combine, or revise the goal statements provided or develop new ones, keeping the risk assessment in mind.

All six of the goal statements from the 2012 HMP were retained, with minor revisions to the exact wording for some of the goal statements. Two additional goal statements were added to address potential impacts from *Severe Weather and Drought*, and *Critical Infrastructure Disruption*.

The following list of goals and objectives was reviewed and finalized during a regular AHAD meeting on June 26, 2018.

Goal 1: Reduce Impacts from Wildfire

- Objective 1.1: Reduce private losses in the Wildland-Urban Interface (WUI).
- Objective 1.2: Increase understanding of the wildfire hazard areas.
- Objective 1.3: Assist property owners in completing mitigation measures.

Goal 2: Reduce Impacts from Severe Weather and Drought

- Objective 2.1: Improve weather forecasting capabilities and information distribution.
- Objective 2.2: Support coordination with state and local drought management initiatives.

Goal 3: Reduce Impacts from Earthquakes

- Objective 3.1: Implement property protection projects to reduce impacts from earthquakes.
- Objective 3.2: Conduct mapping, analysis, and planning projects to reduce impacts from earthquakes.

Goal 4: Reduce Impacts from Critical Infrastructure Disruption

- Objective 4.1: Implement projects to reduce impacts from critical infrastructure disruption.
- Objective 4.2: Improve emergency services communication and resiliency.
- Objective 4.3: Provide measures that enhance the confidentiality, integrity and availability of Cyber-data and information.

Goal 5: Reduce Impacts from Flooding

- Objective 5.1: Implement property protection projects to reduce impacts from flooding.
- Objective 5.2: Conduct planning, analysis, and mapping projects to reduce impacts from flooding.
- Objective 5.3: Implement prevention projects to reduce impacts from flooding.
- Objective 5.4: Provide public education and awareness to reduce impacts from flooding.

Goal 6: Reduce Losses from a Transportation or Hazardous Materials Accident

- Objective 6.1: Enhance emergency services to mitigate impacts from transportation or HAZMAT accident.

Goal 7: Prevent Significant Loss of Life from Communicable Disease and Bioterrorism

- Objective 7.1: Provide public education and awareness to reduce impacts from communicable disease.
- Objective 7.2: Provide state and local governments with antidote supplies.

Goal 8: Promote All-Hazard Mitigation Measures

- Objective 8.1: Provide public education, awareness, and treatment to reduce impacts from all hazards.
- Objective 8.2: Enhance inter-jurisdictional coordination.
- Objective 8.3: Increase and enhance mental health system.
- Objective 8.4: Conduct training to address violence and public attacks.

5.2 ACTION IDENTIFICATION AND PRIORITIZATION

For each objective in the county's risk mitigation strategy, one or more projects are proposed as a means of achieving the objective. In general, the types of mitigation actions can be placed in one of the following categories, which originate from the National Flood Insurance Program's Community Rating System:

- / **Prevention:** Administrative or regulatory actions or processes that influence the way land and buildings are developed and built.
- / **Property protection:** Actions that involve the modification of existing buildings or structures to protect them from a hazard or remove them from the hazard area.
- / **Structural:** Actions that involve the construction of structures to reduce the impact of a hazard.
- / **Natural resource protection:** Actions that, in addition to minimizing hazard losses, also preserve or restore the functions of natural systems.
- / **Emergency services:** Actions that protect people and property during and immediately after a disaster or hazard event.
- / **Public information/education and awareness:** Actions to inform and educate citizens, elected officials, and property owners about the hazards and potential ways to mitigate them.

Each of the proposed projects has value, however, time and financial constraints do not permit all the proposed actions to be implemented immediately. By prioritizing the actions, the most critical and cost-effective projects can be achieved in the short term. The prioritization of the projects serves as a guide for choosing and funding projects; however, depending on the funding sources, some actions may be best accomplished outside the priorities established in this HMP.

To ensure that community goals and other factors are considered when prioritizing projects, a prioritization model that uses the following factors has been developed: cost (including management costs), feasibility (politically, socially, and environmentally), population benefit, property benefit, and hazard rating.

Each of the factors was ranked low, moderate, or high for each of the projects. The methods used to assign a category and the associated score can be generally defined as follows:

<u>Cost:</u> (including management)	3 Score:	Low: < \$10,000
	2 Score:	Moderate: \$10,000 to \$50,000
	1 Score:	High: > \$50,000
<u>Feasibility:</u> (politically, socially, environmentally)	3 Score:	High – high community support
	2 Score:	Moderate – mixed community support
	1 Score:	Low – minimal community support
<u>Population Benefit:</u> (existing or future)	3 Score:	High: > 50% of population benefits
	2 Score:	Moderate: 5 to 50% of population benefits
	1 Score:	Low: < 5% of population benefits

Property Benefit:
(existing or future)

3 Score: High: > 50% of property benefits
 2 Score: Moderate: 5 to 50% of property benefits
 1 Score: Low: < 5% of property benefits

Hazard Rating:
(from risk assessment summary)

3 Score: High
 2 Score: Moderate
 1 Score: Low

Table 5-1 provides a list of identified projects for the 2018 HMP update, and prioritization scoring for each project. Documentation of changes in the list of projects, from the 2012 HMP to this 2018 HMP update, is provided after each goal, and summarized in Section 5.2.1.

Table 5-1. Goals, Objectives, and Prioritized Mitigation Actions (Projects)

Goal 1: Reduce Impacts from Wildfire							
Objective	Project	Cost	Feasibility	Population Benefit	Property Benefit	Hazard Rating	Score
Objective 1.1: Reduce private losses in the Wildland-Urban Interface (WUI).	Expand implementation of Fire Adapted Community Programs for communities in WUI interface and intermix areas with high fire exposure such as Bridger Canyon, Bozeman Pass, Bear Canyon, Clarkston, Big Sky and West Yellowstone.	3	3	2	2	3	13
	Develop standard Defensible Space Requirements for the county utilizing home defense zones in alignment with DNRC.	3	2	2	2	3	12
	Review and update Subdivision Regulations for wildfire risk in all communities.	3	1	3	2	3	12
	Research sustainable approaches for county wide Fuels Reduction program to support the communities in intermix areas along the Bridger, Gallatin and Madison Ranges.	1	1	3	2	3	10
Objective 1.2: Increase understanding of the wildfire hazard areas.	Maintain current Fire Fuels Mapping with integration of CWPP revision with Hazard	3	3	3	2	3	14

	Mitigation Plan to ensure a 5 year update cycle.							
	Provide wildland fire statistics to DNRC monthly to maintain accurate wildfire history database for Gallatin County.	3	3	2	2	3	13	
Objective 1.3: Assist property owners in completing mitigation measures.	Establish mitigation position to support Individual WUI Assessments across the county.	2	3	2	2	3	12	
	Research methods to establish and maintain a homeowner fuels reduction program.	1	2	1	2	3	9	

Nearly all the projects for Goal 1 were retained in this update. Project prioritization scores were adjusted slightly to reflect changes in project status or partial completion. Each of these projects represents an ongoing activity that requires periodic attention as fuel levels change, wildland areas are developed, and fire incidents occur. A notable exclusion in the updated project list is the CWPP which was updated and included as an Attachment to this HMP update.

Goal 2: Reduce Impacts from Severe Weather and Drought

Objective	Project	Cost	Feasibility	Population Benefit	Property Benefit	Hazard Rating	Score
Objective 2.1: Improve weather forecasting capabilities and information distribution.	Monitor opportunities to establish local radar to support enhanced weather forecasts in the Gallatin Valley and Gallatin Canyon.	1	3	3	2	3	12
	Continue supporting annual severe weather education and preparedness program rotating among all communities.	1	3	3	2	3	12
Objective 2.2: Support coordination with state and local drought management initiatives.	City of Bozeman – Continue expansion of drought Communication and Outreach Program.	1	3	2	2	3	11
	City of Bozeman – Continue expansion of Water Use Education.	1	3	3	3	3	13
	City of Bozeman – Continue research and implementation of aquifer	3	1	2	2	3	11

	Storage and Recovery project.						
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This is a new goal in the HMP to address impacts resulting from severe weather and drought. *Enhanced weather forecasts* and *Severe weather education and preparedness* were retained as projects from the previous plan as ongoing efforts. Three new projects were identified to address drought management, education and comm./outreach.

Goal 3: Reduce Impacts from Earthquakes

Objective	Project	Cost	Feasibility	Population Benefit	Property Benefit	Hazard Rating	Score
Objective 3.1: Implement Property Protection Projects to Reduce Impacts from Earthquakes	Continue education and distribution of mitigation opportunities for critical facilities tie downs in older communities such as Belgrade, Bozeman, Manhattan and Three Forks.	1	1	3	3	3	11
	Continue education and distribution of mitigation opportunities for Critical facilities retrofits in all communities.	1	1	3	3	3	11
	Continue education and distribution of mitigation opportunities for anchoring transformers and generators at critical facilities.	2	3	2	2	3	12
	Expansion joints for utilities	1	1	3	2	3	10
Objective 3.2: Conduct Mapping / Analysis / Planning Projects to Reduce Impacts from Earthquakes	Continue Earthquake retrofit education and expansion of online tools.	3	3	3	3	3	15
	Research earthquake retrofit financial incentives to offset local match requirements.	2	1	3	2	3	11
	Support commercial structures seismic surveys.	1	1	3	3	3	11
	Conduct seismic bridge inspections.	1	1	3	3	3	11

Each of the projects for Goal 3 (Goal 2 in previous HMP) was retained in this HMP update, with minor adjustments to the prioritization. Given the age and condition of certain critical infrastructure, these projects are viewed as ongoing efforts.

Goal 4: Reduce Impacts from Critical Infrastructure Disruption

Objective	Project	Cost	Feasibility	Population Benefit	Property Benefit	Hazard Rating	Score
Objective 4.1: Implement Projects to Reduce Impacts from Critical Infrastructure Disruption	Develop tools to support prioritization and Hardening of Critical Infrastructure to support continuity of operations for all jurisdiction.	1	1	2	3	3	10
Objective 4.2: Improve Emergency Services Communication and Resiliency.	Expand education on vulnerability and importance of Critical Infrastructure Backup Systems (Facilities and Communication) to increase all agencies continuity of operation.	2	2	3	2	3	12
Objective 4.3: Provide Measures that Enhance the Confidentiality, Integrity and Availability of Cyber-data and Information	Improve the awareness and understanding of cybersecurity risk to all jurisdictions.	2	2	3	2	3	12

This is a new goal in the HMP to reduce impacts resulting from critical infrastructure disruption. Two projects are retained from the previous HMP (*Prioritize/Harden critical infrastructure* and *Critical infrastructure backup systems*). A new project was added to address cybersecurity concerns.

Goal 5: Reduce Impacts from Flooding

Objective	Project	Cost	Feasibility	Population Benefit	Property Benefit	Hazard Rating	Score
Objective 5.1: Implement Property Protection Projects to Reduce Impacts from Flooding	Expand knowledge of Woody Debris Removal process from Rivers for Big Sky, Gallatin Gateway, Belgrade and Three Forks.	2	1	2	1	2	8
	Develop and implement Bank Stabilization and Flood Control Projects in mapped floodplains such as Three Forks.	1	1	2	2	2	8
	Continued support for Stormwater Management	2	2	3	2	2	11

	projects in Bozeman, Belgrade and Manhattan.						
	Research and implement projects to mitigate exposure to Critical Facilities.	1	1	2	1	2	7
Objective 5.2: Conduct Planning / Analysis / Mapping Projects to Reduce Impacts from Flooding	Support channel Migration Zone (CMZ) Mapping projects on the Gallatin, Madison and Jefferson Rivers and their tributaries.	2	2	2	2	2	10
	Alternative Flood Mitigation Measures Study	2	1	2	2	2	9
	Review and update Dam Failure Mapping with modern models for Big Sky, Belgrade, Gallatin Gateway, Four Corners, Willow Creek and Three Forks.	1	2	2	2	2	9
Objective 5.3: Implement Prevention Projects to Reduce Impacts from Flooding	Develop and maintain Floodplain Regulations for mapped floodplains in Gallatin County, Bozeman, Belgrade and Three Forks.	3	1	2	2	2	10
	Research Buy-out/Relocation Feasibility options for any repetitive loss properties.	1	1	1	2	2	7
Objective 5.4: Provide Public Education and Awareness to Reduce Impacts from Flooding	Continue annual education campaign on flood insurance education.	3	3	3	2	2	13

All projects retained from the previous HMP (Goal 3), and one new project was added: ***Channel Migration Zone (CMZ) Mapping***. Dam failure (breach) mapping project(s) are included, although inundation mapping for all high-hazard dams located within Gallatin County, or located outside the county but having significant flood impacts within the county, has been completed. Project prioritization was adjusted accordingly.

Goal 6: Reduce Losses from a Transportation or Hazardous Materials Accident

Objective	Project	Cost	Feasibility	Population Benefit	Property Benefit	Hazard Rating	Score
Objective 6.1: Enhance Emergency Services to Mitigate Impacts from Transportation or HAZMAT Accident	Develop Emergency/Evacuation Transportation Plan for communities.	2	3	3	2	2	12
	Continue use and support of EPlan for Fixed Site Mapping (TIER) for all communities in the County.	3	2	2	2	2	11
	Develop, train and equip. emergency responders for dealing with Mass Casualty Incidents (MCIs) with buildout of regional response plan and equipment.	3	2	3	2	2	12

Two projects were retained from the previous HMP (Goal 4), and a new project added to address *Mass Casualty Incidents*.

Goal 7: Prevent Significant Loss of Life from Communicable Disease and Bioterrorism

Objective	Project	Cost	Feasibility	Population Benefit	Property Benefit	Hazard Rating	Score
Objective 7.1: Provide Public Education and Awareness to Reduce Impacts from Communicable Disease	Promote public education on preventing communicable disease	3	3	3	1	2	12
	Continue providing training to Health Dept. on incident response.	2	2	3	1	2	10
	Development and sustainment of Medical Surveillance System.	3	2	3	1	2	11
Objective 7.2: Provide State and local governments with antidote supplies	Continue review and sustainment of Chempack program for the region.	3	2	3	1	2	11

Two projects were retained from the previous HMP (Goal 5), *Medical Surveillance System* and *Chempack Plan*. Two new projects were added to: 1) address *public education on preventing communicable disease* and, 2) *provide training to Public Health Dept. staff*.

Goal 8: Promote All-Hazard Mitigation Measures

Objective	Project	Cost	Feasibility	Population Benefit	Property Benefit	Hazard Rating	Score
Objective 8.1: Provide Public Education, Awareness and Treatment to Reduce Impacts from All Hazards	Continue sustainment and expansion of Community Notification System with residents and for internal use by organizations.	2	3	3	3	3	14
	Continue promotion of overall Community Preparedness Program in the County and all 5 cities.	2	3	3	3	2	13
	Evaluate expansion and continue sustainment of Early Warning System for Dams (Middle Creek in place).	1	2	3	2	2	10
Objective 8.2: Enhance Inter-jurisdictional Coordination	Improve health care system communication in county.	2	2	3	1	2	10
	Improve emergency response coordination between Gallatin/Madison Counties in Big Sky Area.	2	2	2	2	2	10
Objective 8.3: Increase and enhance mental health system	Expand and sustain mental health treatment facilities throughout the county.	2	3	3	1	2	11
Objective 8.4: Training to address violence and public attacks	Provide training and programs to support response to Active Killer / Shooter events.	2	3	3	2	2	12

This goal had the most change in projects from the previous HMP (Goal 6). Critical Infrastructure projects were moved to their own grouping under **Goal 4: Reduce Impacts from Critical Infrastructure Disruption**. The **Emergency Alert System** was renamed **Community Notification System**. The Severe weather preparedness project was moved to **Goal 2: Reduce Impacts from Severe Weather and Drought**. Updated **HAZUS analysis** is removed as it was completed as part of this HMP update.. **Enhanced weather forecasting** and **NOAA weather radios** were both deleted. New projects include: **Early Warning System for Dams**, **Improve Coordination between Gallatin/Madison Counties**, **Provide and support mental health treatment facilities**, and **Provide training to address Active Killer / Shooter events**.

5.2.1 SUMMARY OF CHANGES TO MITIGATION ACTIONS

Many of the projects in Goal 1 – *Reduce Impacts from Wildfire*, remained the same in the HMP update. These activities are primarily ongoing projects that needs to be addressed on a recurring basis as fuels grow, houses are built, and new incidents occur. The CWPP, which has been updated and made an Attachment to this HMP update, is meant to be a “living” document that needs to be updated frequently along with the wildfire history database.

Goal 2 - *Reduce Impacts from Severe Weather and Drought*, was broken-out as a separate goal for this HMP update. Two projects aimed at improving weather forecasting and enhanced distribution of severe weather information were retained from the previous HMP. Three new projects were added to support the City of Bozeman’s drought management program via communication and outreach, water use education, and aquifer storage and recovery.

The projects in Goal 3 – *Reduce Impacts from Earthquakes*, remained the same as these are viewed as ongoing efforts given the age of the infrastructure and buildings in the county. ** Note that this was Goal 2 in the 2012 HMP.*

Goal 4 – *Reduce Impacts from Critical Infrastructure Disruption*, was added as a separate goal in this HMP update. Two projects were retained from the previous HMP to address critical infrastructure by hardening assets and developing backup systems for critical infrastructure to improve operational continuity of critical facilities and increase overall disaster resiliency.

Projects to address impacts from flooding were all retained from the previous HMP under Goal 5 (*Goal 3 in 2012 HMP*). A specific project for Three Forks under Objective 5.1 has been identified to redirect a newly identified split flow in the Jefferson River through channelization and increasing conveyance structures to return the flow to the Jefferson River. One new project was added to support Channel Migration Zones (CMZ) mapping, which can be used as a land management tool to help assess river channel migration potential and determine relative risk to infrastructure and real property.

Goal 6 – *Reduce Losses from a Transportation or Hazardous Materials Accident*, retained projects from the 2012 HMP to develop emergency transportation and evacuation plans and to map facilities (fixed sites) where hazardous materials are located via TIER reporting. A new project was added to provide training and equipment to first responders and emergency personnel to address Mass Casualty Incidents (MCIs). ** Note that this was Goal 4 in the 2012 HMP.*

Two projects were retained from the previous HMP to prevent significant loss of life resulting from *Communicable Disease or Bioterrorism* (Goal 7). Two new projects were added to address public education on preventing communicable disease and provide training to Public Health Department staff. ** Note that this was Goal 5 in the 2012 HMP.*

Goal 8 – *Promote All-hazard Mitigation Measures*, projects were changed the most between the 2012 and 2018 plans. *Universal Power Supplies for Communications* was removed as that issue has largely been resolved. The *Emergency Alert System Plan* was retained however the name has been changed to Community Notification System. This is a mass notification product provided by Everbridge (www.everbridge.com) that officials in Gallatin County can use to provide urgent information to the community. The project for an Early Warning System on Middle Creek (Hyalite) Dam was broadened to all high-hazard dams located in the county or located outside the county but have a significant breach inundation effect in the county. Other new projects were added to support *Community Preparedness*, improve *Coordination between Gallatin & Madison Counties in Big Sky*, provide and support *Mental Health Treatment Facilities*, and provide training to address *Active Killer / Shooter incidents*.

5.3 IMPLEMENTATION PLAN

This section outlines development of the final mitigation implementation plan. The implementation plan consists of the specific projects, or actions, designed to meet the plan's goals. Over time the implementation of these projects will be tracked as a measure of demonstrated progress on meeting the plan's goals.

5.3.1 PROGRESS ON PREVIOUS MITIGATION ACTIONS

Gallatin County and communities within the five planning districts/jurisdictions have been successful in implementing actions identified in the 2012 HMP Mitigation Strategy, thus working steadily towards meeting the plan goals.

The 2012 HMP mitigation strategy contained 31 separate mitigation actions for Gallatin County and/or the incorporated cities and towns within the county. Roughly two-thirds of the mitigation actions identified (21 of 31) have been either fully or partially completed since 2012. Some highlights of project implementation for each goal in the 2012 HMP include:

Prevent Losses from Wildfires (Goal 1, 2012 HMP):

- / Fire Adapted Communities' resources are widely available across the county from multiple sources including: GCEM, Gallatin Valley Land Trust, MSU-Extension, and USFS Custer Gallatin NF.
- / Gallatin County Subdivision Regulations (March 5, 2019), Appendix I.7 & I.8, includes standards and requirements for subdivisions proposed in the Wildland-Urban Interface (WUI) that address: site access and evacuation, water supply, vegetation management, defensible space, fuel loading, and fuel breaks/greenbelts. Examples of WUI Covenants are also provided.
- / Several local wildfire mitigation organizations have been developed in West Yellowstone and Big Sky areas in concert with FireSafe Montana to address fuels reduction projects.
- / The CWPP has been updated and provided as an integral Attachment to this HMP update. Within the CWPP, fire fuels mapping, historic wildfire mapping, and Relative Wildfire Hazard and WUI maps have all been provided or updated.
- / Gallatin County researching the addition of a Preparedness and Mitigation Manager position.

Reduce Potential Losses from Earthquakes (Goal 2, 2012 HMP):

- / GCEM provided educational campaign on ReadyGallatin.com to provide information on earthquakes and community resources for preparedness.
- / Discussion topic at AHAD meetings to increase awareness of funding available for seismic retrofits and equipment tie-downs via the Hazard Mitigation Grant Program (HMGP).
- / Using funding from a FEMA grant, structural upgrades were made in the summers of 2013 and 2014 to the buildings that make up the Creative Arts Complex at the MSU-Bozeman campus. Built in 1974, the Creative Arts Complex consists of Haynes, Cheever and Howard Halls and houses the College of Arts and Architecture, School of Art and the School of Music, and College of Agriculture and Technology Education programs, as well as campus Registrar-scheduled classrooms and lecture/performance halls. More information on this project can be found in the MSU Annex (**Annex A**), which is part of this HMP update.

Reduce Damages from Flooding (Goal 3, 2012 HMP):

- / Gallatin County Planning Department website <http://gallatincomt.virtualltownhall.net/Planning> continues to include links to several publications relevant to flood insurance.
- / Staff from Gallatin County, City of Bozeman, and Montana DNRC conducted public mailings and open houses in March of 2018 related to the revised preliminary flood study for the West Gallatin River. Flood insurance was discussed with attendees at the open house.
- / Staff from Gallatin County, City of Bozeman, and Montana DNRC along with a local insurance agent held a class for area realtors in October of 2017 and flood insurance was discussed at length.
- / Gallatin County continues to work on designing and permitting a new bridge to replace the existing Nixon Gulch Bridge, critical infrastructure that crosses the Gallatin River.
- / Gallatin County applied for grant funding to replace Meridian Bridge across the Jefferson River, another important piece of transportation infrastructure.
- / Channel Migration Zone (CMZ) studies were completed on the Gallatin, East Gallatin, Madison, and Jefferson rivers, highlighting additional hazards that residents of those areas should be made aware of, as well as hazards that should be considered as part of infrastructure planning processes.
- / The dam inundation maps for Middle Creek Dam have been updated and published along with a study.
- / Gallatin County Road and Bridge Department as well as public works staff from municipal governments continue to inspect and maintain culverts and other stream crossings as part of their regular operations – this includes debris removal.
- / A large beaver dam was identified in late summer 2017 at Mystic Lake. This structure presents a flood concern in the Bozeman Creek drainage due to the amount of water impounded behind the beaver dam. Multiple government agencies collaborated on this project to remove the hazard.
- / Public education related to the preliminary flood studies for the West Gallatin River and Bozeman Creek (and its tributaries) continues. These studies use current information and modern technology to identify areas that may be prone to flood risk.

- / LiDAR data was acquired in several areas of Gallatin County (Bear Creek, East Gallatin River, Gallatin River, Madison River, Jefferson River) to facilitate future flood studies that will take place over the next several years.
- / As part of these floodplain map updates, Gallatin County and the City of Bozeman have also begun to review their local floodplain management ordinances and will carefully consider whether requirements that exceed the Montana minimum standards are appropriate to enact within their communities.
- / Gallatin County, City of Bozeman, City of Belgrade, City of Three Forks, and the Town of Manhattan remain participants in the NFIP.
- / Gallatin County continues to provide a Map Information Service to help inform the public of flood related hazards that could jeopardize life and property and continues to make floodplain-related information available through publicly accessible, interactive mappers.
- / Hydrologic study conducted for Madison and Jefferson Rivers for update of FEMA Floodplain Maps in Three Forks. Based on results of new the FEMA flood study, Three Forks will pursue flood mitigation work near the frontage road (HWY 2) to redirect a newly identified split flow from the Jefferson River. The work may include channelization and increasing conveyance structures to allow flows to return to the Jefferson River prior to entering into the City's limits. The City of Three Forks is currently working with Great West Engineering to design the project.

Reduce Losses from a Transportation or Hazardous Materials Accident (Goal 4, 2012 HMP):

- / Gallatin County GIS completed a 911 Structure Mapping project to re-address non-compliant structures to State of Montana standards and Enhanced 911 National Emergency Numbering Association guidelines.
- / A Mass Casualty Incident (MCI) Plan was completed by Gallatin County in 2014 and updated in November 2017.

Prevent Significant Loss of Life from Communicable Disease and Bioterrorism (Goal 5, 2012 HMP):

- / Continued work on Chempack Plan education within Gallatin County.
- / Medical Surveillance system is currently in use.
- / Gallatin City-County Health Department Strategic Plan prepared (July 1, 2017 – June 30, 2020).

Promote All-hazards Mitigation Measures (Goal 6, 2012 HMP):

- / Updated HAZUS analyses completed as part of this HMP update.
- / Numerous resources for emergency and disaster preparedness are readily available from ReadyGallatin.com or HealthyGallatin.org.
- / Deployed the Community Notification System, a mass notification product provided by Everbridge to provide urgent information to the community.
- / Gallatin and Madison Counties researching consolidation of emergency management, hazmat and fire warden programs in the Big Sky area.

5.3.2 MITIGATION IMPLEMENTATION PLAN

The results of the 2018 project identification and prioritization meetings are summarized below in **Table 5-2**. Forty projects that scored 10 or higher are shown in the table and ranked by priority score. Where applicable, notes regarding status of project implementation are provided.

Table 5-2 Implementation Plan for Mitigation Actions in Gallatin County and Incorporated Cities/Towns

Project Description	Jurisdiction	Responsible Department/Partner	Potential Funding	Priority Score	Notes - Status
Continue Earthquake retrofit education and expansion of online tools. (Objective 3.2)	Gallatin County and Incorporated Cities	Emergency Management	FEMA	15	<ul style="list-style-type: none"> / Educational campaign on ReadyGallatin.com / Discussion topic at AHAD meetings to inform junior taxing districts of HMGP
Maintain current Fire Fuels Mapping with integration of CWPP revision with Hazard Mitigation Plan to ensure a 5 year update cycle. (Objective 1.2)	Gallatin County and Incorporated Cities	Emergency Management, DNRC, Forest Service, GIS	DNRC, FEMA	14	/
Continue sustainment and expansion of Community Notification System with residents and for internal use by organizations. (Objective 8.1)	Gallatin County and Incorporated Cities (Bozeman)	Emergency Management, 911, HR, IT	FEMA, General Fund	14	<ul style="list-style-type: none"> / Developed local area plan in 2011, Gallatin County / Implemented Community Notification System (Everbridge)
Expand implementation of Fire Adapted Community Programs for communities in WUI interface and intermix areas with high fire exposure such as Bridger Canyon, Bozeman Pass, Bear Canyon, Clarkston, Big Sky and West	Gallatin County and Incorporated Cities (West Yellowstone)	Fire Service, Emergency Management, DNRC	DNRC, FEMA, General Fund	13	

Project Description	Jurisdiction	Responsible Department/Partner	Potential Funding	Priority Score	Notes - Status
Yellowstone (Objective 1.1)					
Provide wildland fire statistics to DNRC monthly to maintain accurate wildfire history database for Gallatin County. (Objective 1.2)	Gallatin County and Incorporated Cities	Emergency Management, 911, DNRC	DNRC	13	/ Provided monthly
Continue expansion of Water Use Education. (Objective 2.2)	City of Bozeman	Public Works Dept. Water Conservation	U.S. Bureau of Reclamation (USBR) WaterSMART grants	13	
Continue promotion of overall Community Preparedness Program in the County and all 5 cities. (Objective 8.1)	Gallatin County and Incorporated Cities	Emergency Management, Elected Officials	FEMA	13	
Continue annual education campaign on flood insurance education. (Objective 5.4)	Gallatin County and Bozeman, Belgrade, Three Forks	Emergency Management, Floodplain Managers	FEMA	13	
Develop standard Defensible Space Requirements for the county utilizing home defense zones in alignment with DNRC. (Objective 1.1)	Gallatin County and Incorporated Cities	Planning, Fire Service	DNRC	12	
Review and update Subdivision Regulations for wildfire risk in all communities. (Objective 1.1)	Gallatin County and Incorporated Cities	Planning, Fire Service	Fees	12	

Project Description	Jurisdiction	Responsible Department/Partner	Potential Funding	Priority Score	Notes - Status
Establish mitigation position to support Individual WUI Assessments across the county. (Objective 1.3)	Gallatin County	Emergency Management, Fire Service	DNRC, FEMA	12	
Continue supporting annual severe weather education and preparedness program rotating among all communities. (Objective 2.1)	Gallatin County and Incorporated Cities	Emergency Management, NWS	NWS	12	
Monitor opportunities to establish local radar to support enhanced weather forecasts in the Gallatin Valley and Gallatin Canyon. (Objective 2.1)	Gallatin County and Incorporated Cities	Emergency Management, NWS, Airport	NWS, FAA,	12	
Continue education and distribution of mitigation opportunities for anchoring transformers and generators at critical facilities. (Objective 3.1)	Gallatin County and Incorporated Cities	Facilities	FEMA	12	
Expand education on vulnerability and importance of Critical Infrastructure Backup Systems (Facilities and Communication) to increase all agencies continuity of	Gallatin County and Incorporated Cities	IT, 911, Facilities	FEMA, General Fund	12	

Project Description	Jurisdiction	Responsible Department/Partner	Potential Funding	Priority Score	Notes - Status
operation. (Facilities/Comm.) Ops. Continuity. (Objective 4.2)					
Improve the awareness and understanding of cybersecurity risk to all jurisdictions. (Objective 4.3)	Gallatin County and Incorporated Cities	IT	FEMA	12	
Develop Emergency/Evacuation Transportation Plan for communities. (Objective 6.1)	Gallatin County and Incorporated Cities	Emergency Management	FEMA, General Fund	12	
Develop, train and equip emergency responders for dealing with Mass Casualty Incidents (MCIs) with buildout of regional response plan and equipment (Objective 6.1)	Gallatin County and Incorporated Cities	Emergency Management, Fire Service, Emergency Medical Services, Hospitals	DOT FEMA	12	
Promote public education on preventing communicable disease. (Objective 7.1)	Gallatin County and Incorporated Cities	Health Department	U.S. Dept. of Health and Human Svc. NIH CDC	12	
Provide training and programs to support response to Active Killer / Shooter events. (Objective 8.4)	Gallatin County and Incorporated Cities	Law Enforcement Health Department Medical Facilities	U.S. Dept. of Justice	12	
Continue expansion of drought Communication and Outreach Program. (Objective 2.2)	City of Bozeman	Public Works Water Conservation	FEMA U.S. Dept. of Agriculture	11	
Continue research and	City of Bozeman	Public Works Water Conservation	USBR WaterSMART	11	

Project Description	Jurisdiction	Responsible Department/Partner	Potential Funding	Priority Score	Notes - Status
implementation of aquifer Storage and Recovery project. (Objective 2.2)					
Continue education and distribution of mitigation opportunities for critical facilities tie downs in older communities such as Belgrade, Bozeman, Manhattan and Three Forks. (Objective 3.1)	Belgrade, Bozeman, Manhattan, Three Forks	Facilities	FEMA	11	
Continue education and distribution of mitigation opportunities for Critical facilities retrofits in all communities. (Objective 3.1)	Gallatin County and Incorporated Cities	Facilities	FEMA	11	
Research earthquake retrofit financial incentives to offset local match requirements. (Objective 3.2)	Gallatin County and Incorporated Cities	Emergency Management	MT DES	11	
Support commercial structures seismic surveys. (Objective 3.2)	Gallatin County and Incorporated Cities	Facilities	FEMA	11	
Conduct Seismic Bridge Inspections. (Objective 3.2)	Gallatin County	Road and Bridge	DOT	11	/ Gallatin County in process of developing bridge replacement program for out of specification bridges
Continue use and support of EPlan for Fixed Site Mapping	Gallatin County and Incorporated Cities	Emergency Management	DEQ PHMSA	11	

Project Description	Jurisdiction	Responsible Department/Partner	Potential Funding	Priority Score	Notes - Status
(TIER) for all communities in the County. (Objective 6.1)					
Continue review and sustainment of Chempack program for the region. (Objective 7.2)	Gallatin County and Incorporated Cities	Health Dept.	DPPHS CDC	11	/ Working on education of Chempack program within Gallatin County
Development and sustainment of Medical Surveillance System. (Objective 7.1)	Gallatin County and Incorporated Cities	Health Dept. Medical Facilities	DPPHS	11	
Expand and sustain mental health treatment facilities throughout the county. (Objective 8.3)	Gallatin County and Incorporated Cities	Health Department, Law Enforcement	DPPHS	11	
Research sustainable approaches for county wide Fuels Reduction program to support the communities in intermix areas along the Bridger, Gallatin and Madison Ranges. (Objective 1.1)	Gallatin County	Emergency Management	FEMA DNRC	10	
Expansion Joint for Utilities. (Objective 3.1)	Gallatin County and Incorporated Cities	Public Works, Facilities	FEMA	10	
Develop tools to support prioritization and Hardening of Critical Infrastructure to support continuity of operations for all	Gallatin County and Incorporated Cities	IT, 911, Facilities	FEMA, General Fund	10	

Project Description	Jurisdiction	Responsible Department/Partner	Potential Funding	Priority Score	Notes - Status
jurisdiction. (Objective 4.1)					
Support channel Migration Zone (CMZ) Mapping projects on the Gallatin, Madison and Jefferson Rivers and their tributaries . (Objective 5.2)	Gallatin County, Three Forks	GIS Dept., Floodplain Managers	FEMA DNRC	10	
Develop and maintain Floodplain Regulations for mapped floodplains in Gallatin County, Bozeman, Belgrade and Three Forks. (Objective 5.3)	Gallatin County, Bozeman, Belgrade, Three Forks	Floodplain Managers	DNRC	10	
Continue providing training to Health Dept. on incident response. (Objective 7.1)	Gallatin County and Incorporated Cities	Health Dept.	DPHHS	10	
Evaluate expansion and continue sustainment of Early Warning System for Dams (Middle Creek in place). (Objective 8.1)	Gallatin County, Belgrade, Three Forks	Emergency Management	FEMA DNRC	10	
Improve emergency response coordination between Gallatin/Madison Counties in Big Sky Area.	Gallatin and Madison Counties	Emergency Management	FEMA	10	
Develop and implement Bank Stabilization and Flood Control Projects in mapped floodplains such as Three Forks.	Gallatin County, Three Forks		FEMA	8	Jefferson River – Three Forks Project

5.4 EXISTING PROGRAMS

The approval of this plan recognizes the role of mitigation in Gallatin County, Bozeman, Belgrade, Manhattan, Three Forks and West Yellowstone. Through adoption of this plan by the political subdivisions, the hazard information and recommendations presented in this plan will be available for incorporation into current and future planning initiatives by each jurisdiction, particularly growth policies, capital improvement plans, zoning regulations, and subdivision regulations. It is recognized that this document is not a regulating plan, but rather a consolidated look at hazards present in communities that each community can utilize to further prepare themselves with.

All planning departments participated in the development of this plan. Several jurisdictions had planning documents under development concurrently (see section 3.6) with this plan and worked to ensure the plans were aligned.

It is not perceived by stakeholders that development since the 2012 plan has altered the overall risk present anywhere in the County. All areas of the County face multiple hazards, many of which require significant work to mitigate to any measurable degree.

5.4.1 GROWTH POLICIES

Agencies within Gallatin County recognize the substantial growth within the County and the associated challenges that come with that. It is understood that the political subdivisions adopting this plan will utilize this plan as a reference when developing, updating and implementing their growth policies. The Hazard Mitigation Plan provides a community ranking of hazards present in the communities for the political subdivisions to utilize in growth related decisions.

5.4.2 CAPITAL IMPROVEMENT PLANS

Agencies within Gallatin County that utilize a capital improvement plan are encouraged to compare their capital assets against the hazards identified in this plan. Ideally, capital infrastructure with significant exposure to an identified hazard will be identified as such. High exposure infrastructure should then be evaluated for mitigations to reduce that exposure, methods to fund the mitigation and scheduled for implementation.

5.4.3 ZONING REGULATIONS

In areas where zoning exists, zoning boards are expected to evaluate land use designations against the identified hazards in this plan. Ideally, when a designated land use presents significant exposure between its intended use and an identified hazard, consideration should be given during zoning review on the designated land use.

5.4.4 SUBDIVISION REGULATIONS

The political subdivisions adopting this plan are expected to utilize the hazards identified in this plan when developing their subdivision review process. Ideally, applicants will demonstrate in their subdivision application how they are mitigating exposure to significant hazards. It's expected that this step is an established part of the subdivision application and review process.

5.4.5 ADDITIONAL SUPPORT

The All Hazards All Discipline (AHAD) group is a standing committee with regular meetings open to anyone with the primary mission of preparing our communities for disasters.

Additional support for mitigation will be encouraged by the participating jurisdictions planning departments through building codes, subdivision review, and land use permits. The many organizations devoted to sustainable communities and the protection of natural resources will be encouraged to use this plan and support its goals.

Hazard specific resources are available through many organizations. Gallatin County Emergency Management (readygallatin.com) serves as a cleaning house for connecting requests for assistance with the correct technical resource.

5.4.6 TECHNICAL RESOURCES

5.4.6.1 MAP RESOURCES

Map products change weekly in many cases. Real time online maps are available below.

Gallatin County Mapper	http://webapps.gallatin.mt.gov/mappers/
Bozeman Community Development Map	https://gisweb.bozeman.net/Html5Viewer/?viewer=planning
Bozeman Floodplain Map	https://gisweb.bozeman.net/Html5Viewer/?viewer=floodplain
Gallatin County Floodplain Map	http://gis.gallatin.mt.gov/floodplainmap/viewer/
Belgrade Zoning Map	http://ci.belgrade.mt.us/planning/zoning_map.pdf
Planning Coordination Committee	http://gis.gallatin.mt.gov/webmaps/?map=PCC&lat=45.72000&lon=-111.13900&scale=288895&l4=-1&l3=-1
Manhattan Zoning Map	https://static1.squarespace.com/static/57fd10961b631b05cf5bee3e/t/58f68567d1758e4e9eb05571/1492551021221/4.12.17+Manhattan+Zone+Map.png
Three Forks Floodplain	https://msc.fema.gov/portal/search?AddressQuery=three%20forks%2C%20mt#searchresultsanchor

5.4.6.2 PLANNING & DEVELOPMENT RESOURCES

Organization	Phone	Web
Gallatin County Planning Department	(406) 582-3130	https://gallatincomt.virtualltownhall.net/planning-community-development
Belgrade Planning Department	(406) 388-3783	http://ci.belgrade.mt.us/planning/
Bozeman Planning Department	(406) 582-2260	https://www.bozeman.net/government/planning
Manhattan Building Department	(406) 284-3235	http://www.townofmanhattan.com/building-zoning
Three Forks Zoning & Planning	(406) 285-3431	https://www.threeforksmontana.us/zoning-planning
Town of West Yellowstone	(406) 646-7795	https://www.townofwestyellowstone.com/government/departments/administration-finance/

5.4.6.3 MITIGATION RESOURCES

Floodplains	<ul style="list-style-type: none"> / http://dnrc.mt.gov/divisions/water/operations/floodplain-management / https://www.fema.gov/floodplain-management / https://www.readygallatin.com/community-resources/preparedness-information/flooding-in-gallatin-county/
Wildfire	<ul style="list-style-type: none"> / http://dnrc.mt.gov/divisions/forestry/fire-and-aviation/fire-prevention-and-preparedness/home-fire-risk / https://www.readygallatin.com/community-resources/preparedness-information/wildfire-in-gallatin-county/
Earthquakes	<ul style="list-style-type: none"> / https://www.readygallatin.com/community-resources/preparedness-information/montana-is-earthquake-country/
Hazardous Materials	<ul style="list-style-type: none"> / https://www.readygallatin.com/community-resources/preparedness-information/hazardous-materials/
Violent Attacks	<ul style="list-style-type: none"> / https://www.readygallatin.com/community-resources/preparedness-information/active-shooter-response/

6.0 PLAN MAINTENANCE PROCEDURES

As with all plans, the periodic plan updates are required to maintain relevance. The Gallatin County AHAD group is ultimately responsible for ensuring this plan is kept up to date. The AHAD group meets bi-monthly and is responsible for coordinating emergency planning issues for the county and communities. Given the broad representation of agencies and jurisdictions, this committee is a good fit, has many members that participated in the plan development. All AHAD group meetings are open to the public.

6.1 PLAN MONITORING, EVALUATION, AND UPDATES

This plan will be maintained by Gallatin County Emergency Management and the AHAD group. This group has representatives from local public safety departments and private entities, all of whom were active in the development of this plan. The HMP will be reviewed annually at one of the AHAD meetings. During this meeting, the AHAD group will review the goals, objectives, and projects, as needed, such as when a mitigation grant application opportunity exists, to determine if the actions for which funding exist are proceeding as planned and if new projects should be initiated. The AHAD group will review any new risk information and modify the plan as indicated by the emergence of new vulnerabilities. Review of ongoing projects will be conducted to determine their status, their practicality, and which actions should be revised. If needed, site visits will be conducted, and/or relevant state or federal program specialists will be invited to speak to the AHAD group and local officials regarding mitigation opportunities. Should federal mitigation grants be received, it is the responsibility of the jurisdiction and/or agency receiving the grant to meet all reporting requirements, unless alternative arrangements have been made.

Annual updates should be made, and AHAD group approval may then take place at a subsequent meeting. As hazard information is added or updated, events occur, and projects are completed, the plan will be updated. Each year, a notice of approval will be sent to Montana Disaster & Emergency Services by Gallatin County Emergency Management, and if major changes take place, a revised version of the plan will also be submitted. Every five years, an update to the plan will be submitted to Montana Disaster & Emergency Services (MT-DES) and the Federal Emergency Management Agency (FEMA) Regional Office for their approval. The next formal submission will occur in 2024. To provide enough time for a full update before this plan expires, the following schedule is recommended:

- / Hazard Mitigation Planning Grant Application Preparations: late-2021
- / Hazard Mitigation Planning Grant Application: early-2022
- / Contracting for Professional or Technical Services (if needed): May-July 2022
- / Plan Reviews and Modifications: September 2022 - December 2023
- / Montana DES and FEMA Reviews: March-June 2024
- / Final Revisions and Adoption: August 2024
- / Final Plan Approval: September 2024

To facilitate the update process, annual updates to the plan are recommended. **Table 6-1** shows the schedule of plan updates. All jurisdictions must participate in the plan update process for the plan to remain approvable for each jurisdiction.

Table 6-1. Schedule of Plan Updates

Plan Section	Post-Disaster	Annually	Every 5 Years
Annual Report to Montana DES		X	X
Adoption Documentation	X	X	X
Introduction			X
Planning Process	X	X	X
Hazard Identification	X		X
Critical Facilities			X
Buildings			X
Infrastructure			X
Economy			X
Land Use and Future Development			X
Vulnerability Assessment Methodology			X
Hazard Profiles	X	X	X
Risk Assessment Summary			X
Goals, Objectives, and Proposed Actions	X	X	X
Action Prioritization	X	X	X
Implementation Plan	X	X	X
Plan Maintenance Procedures			X

6.2 PUBLIC INVOLVEMENT

Public involvement is an integral component of this plan. To encourage continued participation, comments can be directed to the Gallatin County All Hazards All Discipline (AHAD) Chairperson. This committee can be reached through Gallatin County Emergency Management at:

Gallatin County Emergency Management
 219 E Tamarack
 Bozeman, MT 59715
 406-548-0111

Comments will be considered during the annual review of this plan. The public is also encouraged to attend the annual plan review meeting. If needed, a special AHAD subcommittee will be developed to hold public meetings and coordinate plan changes and comments.



ANNEX A

MONTANA STATE UNIVERSITY - BOZEMAN



Montana state university

Gallatin county, montana

Hazard mitigation plan update

Photo Credit: Montana State University

April 2019



Gallatin County
Emergency
Management

Preparing Our Community



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LIST OF ACRONYMS – ANNEX A

A&E	Architecture and Engineering (Division)
AHAD	All Hazards All Discipline
ASMSU	Associated Students of Montana State University
BAT	Behavioral Assessment Team
BIT	Behavioral Intervention Team
CDCP	Centers for Disease Control and Prevention
CPDC	Campus Planning, Design and Construction
CPS	Counseling and Psychological Services
DDOS	Distributed Denial of Service
DHS	Department of Homeland Security
DMA	Disaster Mitigation Act
DPHHS	Department of Public Health and Human Services
EM	Emergency Management
EOP	Emergency Operations Plan
EPCRA	Emergency Planning and Community Right-to-Know Act
ERP	Emergency Response Plan
FBI	Federal Bureau of Investigation
FEMA	Federal Emergency Management Agency
GIS	Geographic Information System
HCP	Hazard Communication Plan
HMGP	Hazard Mitigation Grants Program
HMP	Hazard Mitigation Plan
HVAC	Heating Ventilation and Air Conditioning
IT	Information Technology
LEPC	Local Emergency Planning Committee
MDEQ	Montana Department of Environmental Quality
MDES	Montana Disaster and Emergency Services
MDOA	Montana Department of Administration
MOR	Museum of the Rockies
MSU	Montana State University
MUS	Montana University System

LIST OF ACRONYMS – ANNEX A (continued)

NAMI	National Alliance on Mental Illness
NCDC	National Climatic Data Center
NCES	National Center for Education Statistics
NACUBO	National Association of College and University Business
NFPA	National Fire Protection Association
NOAA	National Oceanic and Atmospheric Administration
OEM	Office of Emergency Management
OSHA	Occupational Safety and Health Administration
PBX	Private Branch Exchange
PCIIS	Property Casualty Insurance Information System
PDM	Pre-Disaster Mitigation
PDMC	Pre-Disaster Mitigation Competitive
RMF	Records Management Facility
SRM	Safety and Risk Management
SUB	Strand (Student) Union Building
TAT	Threat Assessment Team
UHC	Unified Health Committee
UPD	University Police Department
UIT	University Information Technology
USGS	United States Geological Survey

1.0 INTRODUCTION

In the last decade, disasters have affected university and college campuses in the United States with high frequency, sometimes causing death and injury, but always imposing monetary losses and disruption of the institution's teaching, research, and public service. Depending on the degree of severity, natural, human-caused or technological disasters can result in loss of educational time for students and economic hardship for the university and community. Damage to campus buildings and infrastructure and interruption to the institutional mission lead to significant losses that can be measured by faculty and student departures, decreases in research funding, and increases in insurance premiums. The effects from natural, human-caused and technological hazards directly impact the safety and well-being of university faculty, staff and students. While most hazards cannot be eliminated, the effects and losses can be substantially reduced through comprehensive pre-disaster planning and mitigation actions.

Montana State University (MSU), working in conjunction with Montana Disaster and Emergency Services (MDES) and RESPEC prepared this 2018 update to their Pre-Disaster Mitigation (PDM) Plan, which is presented as an Annex to the 2018 Gallatin County Hazard Mitigation Plan (HMP) update. This Annex details the hazards, vulnerabilities, and mitigation opportunities specific to MSU. This Annex is intended to append and supplement the Gallatin County HMP and is not designed to be a standalone document.

2.0 PLANNING PROCESS

The MSU Annex generally followed the planning process outlined in Section 2.0 of the Gallatin County HMP. Any instances in which the Annex deviated from the Gallatin County HMP planning process are noted in the sections below.

2.1 PROJECT STAKEHOLDERS

The MSU Annex planning process was initiated by preparing a list of individual stakeholders whose input was needed to help develop the Annex. Participants included various university employees, as well as members of City and County organizations. Stakeholders participated in the planning process by attending public meetings, reviewing the draft Annex, and/or reading correspondence sent to be aware of progress on the project.

Persons and entities on the stakeholders list received a variety of information during the planning process, including documents for review, meeting notifications, and mitigation strategy documents. A meeting to conduct hazard identification, analysis, and overall risk assessment for the MSU Annex was conducted on April 25, 2018; a list of stakeholder attendees at this meeting can be found in **Appendix C**. Many of these stakeholders also participated in the countywide HMP update process.

2.2 EXISTING PLANS, STUDIES, AND POLICIES

At the initiation of the 2018 Annex process, all new planning documents, studies, reports, and MSU policies relevant to hazard mitigation were reviewed and incorporated into this Annex, where possible. These documents included:

- / Pre-Disaster Mitigation Plan (2013 Update), Montana State University - Bozeman
- / MSU-Bozeman Emergency Operations Plan (EOP) (2014)
- / MSU-Bozeman Emergency Management Policy (2016)
- / MSU-Bozeman Seismic Studies
- / Snow Removal Policy
- / Cold Weather Precautions Policy
- / Occupancy/Vacancy of Laboratories Policy
- / Chemical Safety Program
- / Waste Disposal Guidelines
- / Hazardous Material Policy
- / Hazard Communication Plan (HCP)
- / Residence Hall Security Policy
- / Pre-Fire Planning Policy
- / Fire Protection Equipment Impairment Testing Policy

3.0 CAMPUS PROFILE

Universities are small communities within a community. Effective hazard mitigation must consider the programs offered, research activities, size, location, the distribution of the campus community and its dynamic population composed of students, faculty, staff and a variety of visitors. Visitors and students, especially freshman, are often unfamiliar with the community and the potential hazards that can occur. The dynamic and diverse population on campus and the functions of the campus present a unique challenge in hazard mitigation and awareness.

3.1 CAMPUS OVERVIEW

MSU-Bozeman, the state's largest university, is located within Gallatin County and partially within the city limits of Bozeman. Founded in 1893, MSU-Bozeman is a doctoral and research institution as well as a four-year public institution offering more than 225 academic programs at the certificate, baccalaureate, master's, and doctoral levels (MSU, 2018a). Organizationally, MSU-Bozeman consists of over 100 individual departments and business entities, each having specific roles vital to the instructional, research and residence functions of the university. MSU-Bozeman's students, faculty, staff and visitors comprise a daily population of 14,000 to 18,000 throughout the academic year. Special events can attract from 6,000 to 23,000 attendees on a regular basis.

MSU-Bozeman is situated on 969 acres of land at 4,900 feet elevation. The campus consists of approximately 120 major buildings which comprise over 5 million square feet with a total replacement value of over \$1.5 billion, including more than 40 classroom, research and administrative buildings, 11 residence halls (a 12th residence hall will open in Fall 2020), two residence dining halls, approximately 675 family dwelling units, a student fitness center, The Museum of the Rockies (MOR), the Strand Union Building (SUB) which serves as the center of campus activities, and public events venues such as the Brick Breeden Fieldhouse, Bobcat Stadium and Reynolds Recital Hall (MSU, 2018b).

MSU-Bozeman is headed by a President, Provost and four Vice Presidents (Academic Affairs; Research, Creativity and Technology Transfer; Administration and Finance; and Student Success). Each academic college is headed by a dean. Administrative officers head up non-academic departments on campus. Faculty consists of academic instructors and professors. Non-academic positions consist of staff. The Associated Students of MSU-Bozeman (ASMSU) provide the student government.

MSU-Bozeman is located in a seismically active area of the northern Rocky Mountains approximately 60 miles north of Yellowstone National Park. Weather exposures range from potentially severe cold and heavy snowfalls in winter to summer highs in the low 100°s with potentially severe thunderstorms including high winds and hail. Most of the occupied areas of campus are outside the 100-year flood zone and not susceptible to flooding (FEMA, 2011).



MSU-Bozeman Campus, May 2019.

Photo courtesy M. Rotar.

3.2 CAMPUS POPULATIONS

In the fall of 2018, 16,902 students were enrolled at MSU-Bozeman (MSU, 2018c). Out-of-state and in-state students accounted for 35 and 60 percent, respectively. International students (5 percent) came from 76 countries.

Fall semester generally begins the third week in August and ends the second week in December. Spring semester generally begins the second week in January and ends the first week in May. Summer session generally begins during the third week in May and ends during the first week in August. Summer session is divided into four, four-week sessions.

Populations on campus are dynamic. Occupancy in buildings and residence halls varies based on the time of day and day of the week, and from semester to semester. Most students are on the campus between the hours of 8:00 am and 5:00 pm. Daytime populations are spread out among all buildings. Large lecture halls are located in Gaines Hall, Leon H. Johnson Hall and Norm Asbjornson Hall. Night classes occur between 5:00 pm and 10:00 pm and have lower attendance than day classes.

Faculty and staff are dispersed in various buildings around campus and generally have offices within their own departments. Administration is generally located in Montana Hall.

MSU-Bozeman employs 3,214 permanent faculty and staff, and 620 graduate teaching and research assistants. Of the 3,214 permanent employees, 2,429 are full-time and 785 are part-time. There are 1,300 total faculty of which 829 are full-time and 471 are part-time and department heads. Classified, professional, and service staff number 1,914 (MSU, 2018c).

Visitors come to tour the campus, visit students, visit the MOR, and attend various cultural and athletic activities on campus. Athletic events such as football and basketball games often have a high attendance of students and visitors.

The majority (about 60 percent) of MSU-Bozeman's population resides off-campus in non-university housing. Students of all ages reside in the residence halls, however, most students living on campus are freshman. All students taking six or more credit hours, with less than 30 credit hours accomplished in a residence hall setting, are required to live in university-owned residence halls. Exemptions from this policy include marriage, physical custody of a dependent child, living with a family member, and other circumstances. Family housing consists of apartments and houses. Family housing is leased with priority given to students with dependents (MSU, 2018d).

3.3 CAMPUS ECONOMY

The Montana University System (MUS) plays a vital role for Montana's economy due to direct spending by the institution's faculty, staff and students and the attraction of dollars to the state. The MUS directly and indirectly generates more than \$1 billion in personal income, and is responsible for over 13,000 jobs, both within the MUS and due to the system's wider impact (MUS, 2018).

As the state's land grant institution, MSU-Bozeman's agricultural and outreach missions impact the entire state both economically and culturally. MSU-Bozeman is one of the top 100 research institutions in the country with annual research spending of \$126 million in the 2018 fiscal year (MSU, 2018e).

MSU-Bozeman is an important contributor to the economy of Gallatin County. The community and the university are mutually dependent on each other economically. Numerous local businesses serve the university and local merchants depend upon business from staff and students. The loss of MSU-Bozeman's ability to function or provide services would have a significant impact on Bozeman and the surrounding region. Immediate impacts from university closure would be the loss of jobs and local sales. Long-term losses would include loss of tuition and research dollars and loss of the university's contribution of professional workers to the regional economy.

As a vital component of the economy of Bozeman, Gallatin County and the State of Montana, the loss of MSU-Bozeman's ability to function or provide services would have a devastating impact on the region. Furthermore, loss of research activities and services provided by MSU-Bozeman would have significant negative impacts for the state and nation for many years. MSU-Bozeman is the largest employer in Gallatin County and is the dominant economic component of the region's economy. MSU-Bozeman's total economic contribution to the state economy in 2010 was estimated at approximately \$750 million (MSU, 2010).

3.4 CRITICAL AND VULNERABLE RESOURCES AND VALUES

Resources for the campus include assets such as facilities and infrastructure necessary for the university to conduct operations and provide services. Resources can be housed on campus or in the community. Values include academic, historical and cultural assets.

3.4.1 CAMPUS BUILDINGS

Buildings are an important asset to the campus. Their vulnerability depends upon characteristics such as size, age, building materials and construction quality. Other vulnerability factors include building value, historic value, building contents, occupancy, and whether hazardous materials are stored in them.

3.4.2 CRITICAL FACILITIES AND SERVICES

Critical facilities and services are defined as facilities and services that are essential or critical to campus operations on a daily basis and after an emergency. Examples include shelters, medical care facilities, emergency services (police, fire ambulance), information storage, communications, and utilities.

3.4.2.1 ADMINISTRATIVE SERVICES AND CAMPUS RECORDS

Administrative offices are primarily located in Montana Hall. Offices for the MSU President and three Vice Presidents are located in Montana Hall, as are the Admissions Office, Business Office, Registrar's Office, and Financial Aid Office. Administrative and academic records are stored in Montana Hall. Student health records are stored electronically in servers maintained by UIT in MSU's data center. Archived administrative, academic and employment records are stored in the Facilities Services' Records Management Facility (RMF) (a metal building approximately 6,000 gross square feet complete with a fire suppression system), located on S. Fifth Avenue within the Facilities Services compound. Building records, including original construction drawings, as-builts and contract documents, in paper and digital form, are stored in the RMF. Records stored in Montana Hall and the RMF are vulnerable to destruction in the event of a fire or disaster. Montana Hall is equipped with a fire alarm but does not have a fire suppression system. Facilities Services provides storage units for rent by MSU departments. Currently there are 148 rental storage units in the Facilities Services compound. These units may contain records and material vulnerable to destruction from a disaster event.

3.4.2.2 OFFICE OF RESEARCH COMPLIANCE

The Office of Research Compliance (ORC) oversees University programs designed to ensure compliance with federal, state, and local regulations for research, creates and supports an environment that furthers the ethical and responsible conduct of research, including the Conflict of Interest Management Program and the Research Integrity Verification Program. The office is also responsible for outreach within laboratories and various campus entities to ensure compliance and safety standards are maintained. ORC is located in Montana Hall within the center of campus.

ORC provides oversight of the University Radiation program, Biosafety program, radiation waste, bio-waste, laser safety, x-ray safety, and biohazardous waste. The University has autoclaves in 10 different buildings and access to one incinerator, which are all used for biohazardous waste disposal. In addition, biohazardous and radiological waste can be stored within the Safety and Risk Management Building at the corner of Garfield and Research Drive.

3.4.2.3 SAFETY AND RISK MANAGEMENT

The Safety and Risk Management (SRM) Office helps protect MSU's people, property and assets by providing support and expertise in the areas of risk assessment and mitigation strategies; MSU Workers' Compensation and Stay-at-Work/Return-to-Work (SAW/RTW) programs and policy; Property/Casualty Insurance programs and loss control; Occupational Health & Safety programs; Industrial Hygiene programs; Chemical and Hazardous Waste programs; Electronic Waste and universal waste programs; Biowaste program; Fire & Life Safety; EHS policy and training. The SRM office is located adjacent to campus in the Advanced Technology Park at the corner of Garfield and Research Drive.

SRM provides hazardous waste disposal services for the university. It provides information/assistance for compliance with other state and federal environmental regulations, as well as institutional policy, laboratory inspections, chemical hygiene plan templates and reviews, and laboratory safety training.

3.4.2.4 UNIVERSITY HEALTH PARTNERS

University Health Partners is located in the Swingle Health Center, adjacent to the SUB. Programs include basic medical services, including lab, pharmacy, x-ray, nutrition, allergy shots and a travel clinic; dental services including regular cleanings and hygiene, restorative care (fillings, crowns, etc.) and urgent care; an Office of Health Advancement offering an environmental approach to a balanced lifestyle, health and well-being; and Counseling & Psychological Services (CPS). All health care matters beyond what University Health Partners can provide are handled by Bozeman Health Deaconess Hospital.

CPS is the university's resource for mental health issues. They provide counseling to MSU students and educational and preventive outreach, consultation, and crisis management to students, faculty and staff. The CPS staff is comprised of licensed psychologists and counselors who are available to students in crisis and for staff to consult with about at-risk students. Students who are in crisis are seen on a walk-in basis, and CPS staff is available for after-hours crisis management or consultation as part of their 24-hour on-call service during the academic year.

3.4.2.5 UNIVERSITY POLICE DEPARTMENT

MSU-Bozeman operates its own statutorily authorized police department comprised of state-certified, sworn personnel, and is staffed on a 24/7/365 basis. The University Police Department operates the campus 911 center and maintains a Mutual Aid/Memorandum of Understanding with the City of Bozeman which authorizes the University Police Department to operate within the city's jurisdiction. The University Police Department is located in the Huffman Building on the corner of South 7th Ave. and Kagy Boulevard.

To enhance the safety and security of the campus community, 10 blue light emergency phones were installed on the MSU campus in January of 2009. Each phone has an emergency button and an information button. When the emergency button is depressed, the blue strobe light is activated and the phone connects with the 911 emergency line at the Gallatin County 911 center, putting the caller in contact with a 911 dispatcher. Any time the emergency button is depressed, officers are dispatched to the activated blue light phone location. When the information button is depressed, the phone connects to a non-emergency phone line at the university police department for general information.

A new, similarly named smartphone app called AppArmor brings the functionality of the blue light phones to cell phones as an added level of security both on and off campus (AppArmor, 2019). AppArmor works by bridging two common issues when making emergency calls on a college campus. The first is that, when calling emergency services, cell phones aren't always that accurate. Unlike a landline, which is associated with the address of the account holder, a cellphone's location depends on the nearest cell tower of a caller, often giving just a general location. AppArmor uses Wi-Fi or cellular data to provide your location data when you make an emergency call with the app. This gives far more accurate information about where you are, and therefore provides first responders with a better idea of where they need to go.

Contracted security monitors building fire alarms, laboratory equipment, environmental controls, and computer lab equipment intrusion detection.

3.4.2.6 EMERGENCY MANAGEMENT

MSU-Bozeman is committed to protecting the lives, safety, and welfare of its campus and community members. The MSU Office of Emergency Management (OEM) is charged with improving the University's readiness for potential emergencies; protecting and preserving its intellectual property, physical assets and facilities; establishing requirements for tasked organizations to develop plans and execute annual training exercises; and ensuring the continuity of operations of essential services. The OEM maintains MSU-Bozeman's Emergency Operations Plan (EOP) and the MSU Alert system, both of which are described below.

The EOP provides a framework in which MSU-Bozeman, along with its officials, units, departments, offices, and campus community, can work to prevent, prepare for, respond to, and recover from the effects of emergencies and disasters. Recognizing the impracticality of developing and maintaining individual plans for every possible emergency, the EOP provides general guidelines for responding to emergency events by activating decision processes, gathering decision-makers, and marshaling resources to address University emergencies. The EOP is intended to be a dynamic document that establishes a framework to guide effective response to emergencies, minimizes the impacts of emergencies, maximizes the effectiveness of university resources and that is scalable, flexible, and adaptable enough to apply to a broad range of emergencies.

MSU Alert is a notification system to deliver critical information to MSU students, faculty and staff in the event of an emergency. The system delivers emergency messages through text messaging to mobile phones and e-mails, as well as voice messages to personal phones. In 2018, MSU entered into a partnership with Gallatin County to produce a fortified and integrated emergency notification system powered by Everbridge. This partnership allows enhanced communications between MSU and Gallatin County during the time of a life-threatening emergency. Previously, MSU Alerts were only sent regarding issues within the immediate university property lines. The upgraded system now allows users to receive emergency notifications of events occurring within Gallatin County that could affect the MSU community.

Two types of notifications, emergency notifications and timely warnings, are provided to students, faculty, and staff at MSU. The MSU Alert system only provides emergency notifications. Members of the MSU community currently receive timely warnings to their employee or student email and will continue to do so. Please see below for additional details about the types of notifications.

- **Emergency Notifications:** issued when a potential on-going threat which could cause immediate harm to the health and safety of students, faculty, and staff exists. Being that these notifications are time sensitive and crucial they are distributed via a text message alert, voice calls, and emails.
- **Timely Warnings:** issued to notify students, faculty, and staff when a serious crime has occurred with the potential to be repeated or on-going, in accordance with the [Clery Act](#). These notifications are sent via email.

Contact information that is in the MSU Alert system is only to be used for emergency alerting purposes. User's information will never be sold for commercial use. Only emergency notifications will be sent through the MSU Alert system. The system will never send spam. A test of the system will be conducted once each semester.

3.4.2.7 SHELTERS AND RESIDENCE HALLS

The SUB is identified as the main shelter for the campus community. If sheltering needs arose, MSU-Bozeman students would have priority to use the on-campus facilities before the general public. Grace Bible Church on S. 19th Ave. is the nearest off-campus emergency shelter to the MSU-Bozeman campus.

MSU-Bozeman's residence hall facilities and other campus housing serve approximately 4,200 on-campus residents. All residence halls are non-smoking and have sprinklers for fire suppression. There are several housing facilities on campus for graduate students, family housing and guests of the MSU-Bozeman campus.

3.4.2.8 UNIVERSITY SERVICES

MSU-Bozeman includes approximately 5 million square feet of academic, research and residential building space in 120 buildings with a replacement value of over \$1.5 billion (MSU, 2018f). University Services provides maintenance for approximately 2.5 million square feet of academic space, 2 million square feet of housing, 200 acres of landscaped grounds, and roughly 25 miles of sidewalk. University Services employs approximately 200 full-time employees and 60 temporary/student employees. University Services consists of seven service management areas including: Campus Planning; Design & Construction; Engineering & Utilities; Facilities Service; Mail Services and Passports; Safety & Risk Management; and Space Planning & Management.

Functions that occur within these work management areas include custodial services; landscape and grounds maintenance; waste management and recycling; snow removal; horticulture management and inventory; vehicle and equipment machine repair shop; accounting; budgeting; computer system operation; campus motor pool; central campus stores; long-term campus storage management; campus maintenance, repairs, maintenance and renovation in building trades including electrical, plumbing, carpentry, locksmith, painting, sheet metal and general contractor services; engineering services; utilities management; central heating plant operation; preventive maintenance; refrigeration and air conditioning repairs, maintenance, and renovation; heating and ventilation repair, maintenance, and renovation; energy grant program management; campus master planning; capital construction project management; long range building program management; maintenance, repair, and renovation planning and design services; contract administration; architectural services; work control management; project scheduling; estimating services; work order management; manpower planning; elevator repair maintenance and renovation; asbestos removal; radio communications; archives, building records, and personnel records management; and contract documentation.

In the event of a disaster, University Services would ensure that the infrastructure of the campus was maintained. In the event of a severe storm or earthquake that left debris behind, University Services would be responsible for clean-up using both in-house and contracted resources. During severe winter events, Facilities Services and Parking Services are responsible for snow removal on campus. University Services would be responsible for shutting down a building's heating, ventilation and air conditioning (HVAC) system in the event of a chemical, biological, or nuclear weapons attack or accidental toxic release. University Services is responsible for helping departments secure shelving and other non-structural hazard mitigation activities.

3.4.3 CRITICAL INFRASTRUCTURE

Campus infrastructure includes systems that are essential for campus activities, administrative operations, maintaining many types of campus experiments, and the ability of the campus to communicate. MSU-Bozeman owns, operates, maintains and distributes its own utility systems including primary electricity, natural gas, steam and condensate, water and sewer, and communications and data systems. Determining location, condition and vulnerability of utilities and communications systems needed for campus operations is important for mitigation of potential damages and overall hazard risk.

3.4.3.1 UNDERGROUND TUNNELS

Central campus utilities are served through an underground utility tunnel network comprised of approximately 8,000 linear feet of main and lateral tunnels. Underground tunnels on the MSU-Bozeman campus were completed in the summer of 2001 and have a modern seismic design. The tunnels service the central campus core buildings. Five percent of the total electrical and 50 percent of data and communications are run through the tunnel system. Steam and condensate, compressed air, domestic water and irrigation water are also run through the tunnels. Select authorized employees have access to the tunnel systems. The tunnels are secured and alarmed to prevent unauthorized access. Fire alarms and emergency sirens cannot be heard in the tunnels making them a vulnerable location in the event of a disaster. A linear antenna inside the tunnel provides direct communications to workmen's two-way radios.

3.4.3.2 CENTRAL HEATING PLANT

The central heating plant on campus provides steam heat to the entire campus except for family housing. Steam from the plant either goes through pipes in the underground tunnels or is dispersed through buried piping. There is an emergency electrical generator for the heating plant which allows heat to be provided to buildings during power outages; however, heat distribution equipment in individual buildings may be affected by a power interruption to that building. The plant has been seismically retrofitted to protect against earthquake damage.

3.4.3.3 ELECTRICITY AND NATURAL GAS

Electricity and natural gas are provided to the campus by NorthWestern Energy. Electrical service enters the campus at one central point and is fed from the Bozeman Southside Substation at the northwest corner of College and South 11th Avenue. A small portion of the south part of campus is fed from the Sourdough Substation. Electrical lines are all underground on campus.

Power outages can occur on campus if damage occurs to above-ground power lines or poles in Bozeman. Power outages have been caused by heavy snow, ice storms, car accidents, broken tree limbs and high winds. Earthquakes also have the potential to down power lines. Generators on campus power emergency lighting in some buildings. Natural gas lines are laid out in zones, each having an emergency shut off valve.

3.4.3.4 INFORMATION SYSTEMS, TELEPHONE, COMMUNICATIONS AND INTERNET

MSU-Bozeman's University Information Technology (UIT) provides information technology services to MSU-Bozeman, MSU-Billings, MSU-Northern and the College of Technology at Great Falls. Specific to MSU-Bozeman, UIT supports the following critical operations relative to hazard mitigation and response:

- / Data Network
- / Campus Communications & Wiring
- / Campus Telephone Communications
- / Enterprise Administrative Applications
- / Desktop Support and maintenance
- / Classroom Technology
- / Service Desk
- / Security
- / IT Governance

Services supporting these critical areas are managed and coordinated across personnel assets that are both centralized (UIT) and embedded (multiple departments). Many of the mission critical applications and technology services exist in the cloud – either hosted or dependent upon cloud-based vendors and third parties. Other services are maintained, managed and coordinated across two data centers that exist on the MSU-Bozeman campus. Data centers presently exist in the AJM Johnson Hall building, and the Renne Library building on campus, and are managed, monitored and sustained by UIT.

IT Community personnel are located across multiple departments and buildings across the MSU-Bozeman Campus. UIT, the central unit for information technology services, resides at two locations – CFT5, located to the south of the MSU-Bozeman campus; Nopper 910, located to the west of the MSU-Bozeman Academic campus in the MSU Innovation Campus, and Renne Library, located on campus. Telecommunications infrastructure is managed by UIT Telephone Services. Data Network infrastructure is managed by UIT Infrastructure Services. Both IT services facilitate communications and response for applications and personnel. Electronic mail is a cloud-based service, managed and by UIT personnel, yet hosted in the Microsoft Azure cloud environment.

3.4.3.5 WATER AND SEWER

Water and sewer services are provided to MSU-Bozeman by the City of Bozeman. Primary sources of water are Lyman Creek in the Bridger Mountains, Sourdough Creek and the Hyalite Creek Reservoir in the Gallatin Mountains. Some water lines on campus are located in the tunnel systems. A disruption in water services to campus would cause loss of potable water, sanitary services and loss of steam production from the heating plant in turn causing loss of heat. Students residing on campus would be at the greatest risk if the water system on campus was disrupted or compromised.

3.4.4 SOCIAL AND ACADEMIC ASSETS

Academic, historic and cultural resources housed on campus are considered priority assets. The following section describes these campus resources.

3.4.4.1 HISTORIC BUILDINGS

Preserving and maintaining historic buildings on campus preserves a part of the University's past and adds to the atmosphere of the campus environment by preserving architecture. Construction materials and techniques used during the late 19th and early 20th century cause historical buildings to be more at risk for earthquakes.

Although many buildings on the MSU-Bozeman campus are eligible for inclusion in the National Register of Historic Places, as of 2018 none are so classified. The Montana Antiquities Act requires state agencies to report restoration and maintenance expenditures to preserve Heritage Properties, including buildings over 50 years of age, structures, landscapes, and prehistoric elements above and below the ground. The first Heritage Report was filed in February 2012.

3.4.4.2 CAMPUS RESEARCH

MSU-Bozeman is ranked as one of the top research universities in the U.S. with grant and contract-sponsored research that totaled \$126 million in the 2018 fiscal year, 75.4 percent of which were federal funds competitively won by researchers (MSU, 2018e). The Carnegie Foundation for the Advancement of Teaching recognizes MSU-Bozeman as one of 108 research universities with "very high research activity."

As a land grant university, MSU-Bozeman has a long tradition of supporting basic and applied research and creative activity. MSU-Bozeman currently holds 75 patents for innovations and processes developed through faculty research, with many additional patents pending, and has over 250 license and option agreements with private firms, many of which are with Montana companies.

Although research equipment can be fiscally recovered, intellectual research and time accumulated on research projects cannot be fiscally recovered in the event of a disaster. Research that involves refrigeration or heat (such as vegetation in the plant growth center) is vulnerable to power outages. Research projects are also vulnerable to earthquakes and structure fire.

Buildings where research takes place on the MSU-Bozeman campus include: Barnard Hall, Norm Asbjornson Hall, Cobleigh Hall, Roberts Hall, Chemistry/Biochemistry Research Building, Traphagen Hall, Gaines Hall, Lewis Hall, Animal Resources Building, Leon H. Johnson Hall, Faculty Court, and leased space in the Advanced Technology Park.

3.4.4.3 MUSEUM OF THE ROCKIES

The Museum of the Rockies is a division of MSU-Bozeman and reports to the Provost. Students, faculty, and visiting scholars use its collections and exhibits for classes, research, and programs. Some museum curators teach on campus and some MSU-Bozeman professors hold adjunct appointments at the museum. Operating revenues are earned from admissions, programs, memberships, and the museum store. Additional support is provided by The Museum of the Rockies, Inc., a private non-profit corporation. Funds for the original buildings and the 1989 expansion were provided by private sources. The museum offers a variety of educational programs for people of all ages including tours, classes, lectures, field trips, field schools, and special events.

The museum is accredited by the American Association of Museums. It attracted 196,201 visitors in 2017 from across the U.S. (MOR, 2018). The prehistory and history of the northern Rocky Mountain region are told through a series of permanent exhibits. Three galleries feature temporary and traveling exhibitions related to the region. The museum also houses the world-class Taylor Planetarium which hosts a variety of presentations including feature shows for children and adults, the majority of which are original productions, as well as school programs, live narrated night sky programs, and laser shows.

3.4.4.4 SPECIAL COLLECTIONS

The Renne Library, constructed in 1949 and expanded in 1996, accommodates more than 880,000 volumes and houses special collections, manuscripts and archives (MSU, 2018g). Special Collections and manuscripts are located on the second floor and Archives are housed on the fourth floor. Special Collections include documents and memorabilia from the career of Montana's U.S. Senator Burton K. Wheeler, the Merrill G. Burlingame Special Collection, the Yellowstone National Park Collection and the Trout and Salmonid Collection. The Renne Library is designated as an institutional digital repository including scholar works and special collections. The Merrill G. Burlingame Special Collections serve Montana State University libraries as the preferred repository for primary and secondary source material on specific topics related to Montana, the geographic and economic region, as well as the history and published records of the University. Special collections are constantly observed by staff and are kept locked. The library's general collections are valued at \$17 million and the Special Collections (books and manuscripts) valued at \$117.9 million. General building contents of the library are valued at \$34.2 million.

The library was renovated in 2001 which included seismic enhancements and installation of modern fire suppression equipment including both wet and dry systems. The library staff keeps rolls of plastic sheeting on hand throughout the stacks to minimize damage to the books from the sprinklers.

3.4.4.5 ATHLETICS AND CAMPUS EVENTS

Athletic and cultural events on campus draw attendance from the student population and the community. High attendance at athletic events presents an increased risk of human loss should a catastrophic incident occur. Major athletic facilities on campus include the Brick Breeden Fieldhouse/Max Worthington Arena, Shroyer Gym, and Bobcat Stadium. Should an emergency or disaster occur during an athletic or cultural event, patrons would be directed by the intercom for instructions or actions to take. MSU-Bozeman campus guests are provided the opportunity to utilize the MSU Alert system to receive emergency notifications.

The *Brick Breeden Fieldhouse/Max Worthington Arena* opened in 1958 as the premiere college basketball and all-purpose facility in the Northwest. When it opened, the facility was the largest clear span timber dome structure in existence, and the second-largest building of its type in the U.S. The fieldhouse underwent a major renovation in 1998, at a cost of over \$15 million, to replace seats, expand concession and ticket office facilities, and add a new entrance on the south side of the building. Today, the Brick Breeden Fieldhouse hosts several sports including basketball, track and field, and volleyball. Concerts, trade events, and rodeos are also hosted at the fieldhouse. The current maximum capacity of the facility is 8,000.

Bobcat Stadium, constructed in 1973, is a multi-purpose stadium that is home to the MSU Bobcats football team. The stadium underwent \$9.2 million in renovations prior to the 1998 football season which included new concession stands and restrooms, a new north end-zone complex, dressing facilities for teams and officials, a new grandstand with 38 sky suites, an indoor stadium club, a corporate entertaining area, and press facilities. A new south end zone added in 2011 increased stadium seating to its current 17,777 capacity. The stadium is a multi-functional facility and hosts concerts and other events in addition to football games. When the facility is used for concerts, capacity increases to about 22,000. Bobcat Stadium is on the U.S. Department of Homeland Security's national list of critical infrastructure. The list is used to determine what sites need protection from terrorist attacks.

Shroyer Gymnasium, built in 1973, is the primary women's volleyball facility at MSU-Bozeman and is also regularly used as a concert venue. The capacity of the gymnasium varies from 1,400 to 1,600 depending on the configuration. Shroyer Gym connects the Brick Breeden Fieldhouse to the Marga Hosaeus Health and Physical Education Center, which houses a swimming pool, two gymnasiums, a state-of-the-art student wellness center, along with handball and racquetball courts.

The hub of student activities is the Student Union at the **SUB** with services including the MSU-Bozeman Bookstore, Exit Gallery, KGLT radio station, Procrastinator Theater, numerous eateries, meeting rooms, conference services, offices for student government, student activities and special support programs. Cultural events for the general public occur throughout the year at the MSU-Bozeman campus and are generally held in conference rooms in the SUB.

3.4.4.6 LANDSCAPING

Campus landscapes and exterior spaces are a fundamental piece of MSU's social, aesthetic, cultural, and facilities infrastructure. They serve as spaces for gathering, outdoor classrooms and recreation. MSU has a Landscape Master Plan to provide a framework for planning, design, development, and maintenance of the exterior spaces of the MSU-Bozeman campus.

In general, every tree on campus is assessed and maintained on a 7-year rotational schedule. Special considerations are given to younger trees (< 20 years), trees with high target risks, trees interacting with infrastructure including sight lines, lighting and signage, and documented hazard trees. Trees are maintained to maximize health and habit increasing their ability to withstand natural pressures and potentially increase tree longevity while increasing safety and reducing impacts on facilities operations and infrastructure.

MSU-Bozeman has a Tree Care Plan that addresses emergencies with regard to pruning. Emergency response addresses safety first and accessibility second. Once these critical needs are met a systematic, emergency specific plan is developed and implemented. Safety would include people, equipment (generators, HVAC, etc), buildings, and pedestrian and vehicle circulation routes. Clean up and restoration begins after critical needs are met.

4.0 RISK ASSESSMENT/HAZARD PROFILES

Hazards considered during the planning process included natural, biological, human-made, and technological. Hazards for the MSU Annex were reviewed by stakeholders and the consultant. Hazards identified at present include (in alphabetical order):

- / Active Killer
- / Communicable Disease
- / Critical Infrastructure Disruption
- / Cyber Threats
- / Earthquakes
- / Environmental Hazards
- / Hazardous Material Incidents
- / Regulatory Compliance Risk
- / Severe Weather
- / Structure Fire
- / Terrorism, Civil Unrest, and Violence
- / Volcanic Eruption

Identified hazards were ranked for their probability of occurrence and the impacts that would result to the population, property, and economy should the hazard occur. The hazard occurrence probability and each of the potential impact categories were assigned numeric values of 1 (Low), 2 (Moderate), or 3 (High). A weighting method was then applied to the hazard impact values by multiplying the population impact value by 3, the property impact value by 2, and the economy impact value by 1. A final risk value is assigned to each hazard by taking the sum of weighted impact values and multiplying by the hazard probability value.

Each of the identified hazards includes a risk assessment table at the end of the hazard profile which summarizes the relative overall risk value. The total numeric risk values are classified as High (value: 28 and higher), Moderate (value: 19 – 27), and Low (value: below 19). The calculated numeric risk value is provided in parentheses following the descriptive risk value (Low, Moderate, High).

4.1 ACTIVE KILLER (SHOOTER)

4.1.1 DESCRIPTION AND HISTORY

According to the US Department of Homeland Security (DHS), an active shooter is “an individual engaged in killing or attempting to kill people in a confined and populated area; in most cases, active shooters use firearm(s) and there is no pattern or method to their selection of victims.” (US DHS, 2008).

Active killers—most often in the form of active shooters—have been an increasingly prevalent threat facing universities and schools across the county. According to the FBI, there were 250 active shooter incidents in the U.S. between 2000 and 2017, with over half (128) of the incidents occurring in the last six years of that time frame (2012 – 2017) (FBI, 2018).

The Virginia Tech Massacre was a school shooting that took place on April 16, 2007, on the campus of Virginia Tech. Seung-Hui Cho, a senior at Virginia Tech, shot and killed 32 people and wounded 17 others in two separate attacks, approximately two hours apart, before committing suicide. Cho had previously been diagnosed with a severe anxiety disorder.

The attacks received international media coverage and drew widespread criticism of U.S. gun culture. It sparked intense debate about gun violence, gun laws, gaps in the U.S. system for treating mental health issues, the perpetrator's state of mind, the responsibility of college administrations, privacy laws, and other issues. The Virginia Tech Review Panel, a state-appointed body assigned to review the incident, criticized Virginia Tech administrators for failing to take action that might have reduced the number of casualties. The panel's report also reviewed gun laws and pointed out gaps in mental health care as well as privacy laws that left Cho's deteriorating condition in college untreated.

The aftermath of the shootings at Virginia Tech focused renewed attention on how colleges and universities deal with campus safety and security issues. Beyond traditional measures to protect students, employees, and property, safety and security efforts undertaken by higher education institutions now must also address the possibility of terrorist actions, such as bomb threats and threats of physical violence against campus research facilities, individual faculty, and administrators.

A survey conducted by the National Alliance on Mental Illness (NAMI) (2012) found that among college students, 73% had experienced some type of mental health crisis while at college. The National Campus Safety and Security Project (National Association of College and University Business Officers – NACUBO, 2008) addressed the ability of colleges and universities to assess mental health issues and threats on campus. About 76 percent of public four-year college and university respondents said that a behavioral assessment team (BAT) exists on their campus. An additional 13 percent of respondents reported their campus was developing such a team. A BAT deals with matters of crisis, disturbing behavior, and medical and psychiatric situations of individual students, faculty, and/or staff in order to determine needs and appropriate responses. Fewer than half of the respondents reported that their campus had a threat assessment team (TAT). A TAT assists in assessing threatening situations and developing risk abatement plans that minimize the potential risk for violence. Mental health services are available at virtually all public four-year colleges and universities through the health center or a separate counseling center. More than 60 percent of public four-year institutions reported the availability of a campus hotline to assist staff, faculty, and students with behavioral and mental health issues. About two-thirds of respondents said a protocol exists to address the needs of troubled faculty and staff.

MSU-Bozeman currently has a Behavioral Intervention Team (BIT) that consists of various professionals responsible for identifying, assessing, and responding to serious concerns and/or disruptive behavior by students who may threaten the health or safety of the campus community. The university's Active Shooter Preparedness training does include the Run, Hide, Fight response protocol.



From MSU Office of Emergency management website – Active Shooter

4.1.2 PROBABILITY AND MAGNITUDE

School shootings comprise a majority of active killer events. In 2017, there were 64 incidents of gunfire on school grounds, none of which occurred in Montana or its neighboring states (Everytown, 2018). The most recent data available indicates there are approximately 140,000 educational institutions in the United States, including public, private, and post-secondary schools (NCES, 2018). Using these statistics, the probability of any one school experiencing an active shooter in a given year is approximately 0.05%, if risk is assumed to be uniform across all schools. Given the increasing trend of active shooter incidents, it is likely the probability will increase with time.

The magnitude of an event can vary significantly, depending on the type of attack and the ability of responders to control the situation. With an event of significant magnitude, local resources would rapidly be overwhelmed. Though resources from Bozeman, Gallatin County, and even surrounding counties can be called in, the time to mobilize resources is quite long compared to how quickly active killer incidents develop and escalate.

4.1.3 VULNERABILITIES

The greatest risk in an active killer incident is to life. All students, faculty, staff, and visitors on-campus during the attack would be at risk. The effects would be particularly dramatic in a large-scale event, as local resources would quickly be overwhelmed.

In the aftermath of such an event, economic losses could be seen should enrollment drop in response. This could result in economic hardships for students and staff, as an unexpected drop in revenue may require increased tuition and decreased payroll spending.

4.1.4 OVERALL HAZARD PROFILE

	Probability of Major Disaster	Property Impact	Population Impact	Economic Impact	Overall Risk
Active Killer	Moderate	Low	Moderate	Moderate	Moderate (20)

4.2 COMMUNICABLE DISEASE

4.2.1 DESCRIPTION AND HISTORY

Communicable diseases, sometimes called infectious diseases, are illnesses caused by organisms such as bacteria, viruses, fungi and parasites. Sometimes the illness is not due to the organism itself, but rather a toxin that the organism produces after it has been introduced into a human host. Communicable disease may be transmitted (spread) from one infected person to another, from an animal to a human, from an animal to an animal, or from some inanimate object (doorknobs, tabletops, etc.) to an individual. A pandemic is a global disease outbreak. Human diseases, particularly epidemics, are possible throughout the nation. The Montana Communicable Disease Annual Report summarizes and highlights the diseases and outbreaks investigated by the DPHHS Communicable Disease and Epidemiology Section and local health jurisdictions and partners (DPHHS, 2017).

Communicable disease is a concern for campuses across the nation. With students coming from all over the country and internationally, the chances for disease spread increases. Communal living in residence halls also increases the risk of communicable disease. Residential and social circumstances in the college environment create a high-risk environment for transmission or exposure if an outbreak were to occur.

The most serious communicable disease on U.S. campuses is meningococcal disease. Meningococcal disease is a potentially life-threatening bacterial infection. The disease is most commonly expressed as either meningococcal meningitis, an inflammation of the membranes surrounding the brain and spinal cord, or meningococemia, a presence of bacteria in the blood. It is estimated that 100 to 125 cases of meningococcal disease occur annually on college campuses and 5 to 15 students die as a result. The disease can result in permanent brain damage, hearing loss, learning disability, limb amputation, kidney failure or death. The U.S. Centers for Disease Control and Prevention (CDCP) reports that freshman living in residence halls are the highest risk group and are six times more likely than any other risk group to contract meningococcal disease (CDCP, 2018).

4.2.2 PROBABILITY AND MAGNITUDE

The probability of an epidemic that could significantly affect the MSU-Bozeman campus is difficult to assess based on history, current data and the rapid advancement in medical science. However, based on the Gallatin County communicable disease statistics, this hazard a probability rating of “moderate”.

The magnitude of a communicable disease outbreak varies from common viral outbreaks to widespread bacterial infection. Almost any communicable disease that enters the regional population could overwhelm local health resources as would any rapidly spreading bioterrorism event for which there is no available vaccine or containment capability.

4.2.3 VULNERABILITY

A major communicable disease outbreak on campus would have direct impacts to the health of students, staff, and faculty. The percentage of the campus population affected by an outbreak and the number of fatalities would be highly dependent on the disease itself and amount of advanced warning of a possible outbreak.

A major communicable disease outbreak could also disrupt the ability of MSU-Bozeman to conduct classes. In the case of a severe outbreak event, the campus could potentially reduce academic and/or business services. This could result in a significant economic impact to the students, faculty, and staff and the region. MSU-Bozeman is included within the Gallatin County Pandemic Plan and coordinates regularly with local health officials through the Unified Health Committee (UHC).

An immunization policy is in effect and applicable for all new and returning students at MSU-Bozeman. For students born after December 31, 1956, proof of two separate doses of measles and rubella immunization is required before students can register for courses. This policy is in effect at all units of the MUS.

4.2.4 OVERALL HAZARD PROFILE

	Probability of Major Disaster	Property Impact	Population Impact	Economic Impact	Overall Risk
Communicable Disease	Moderate	Low	Moderate	Low	Low (18)

4.3 CRITICAL INFRASTRUCTURE DISRUPTION

4.3.1 DESCRIPTION AND HISTORY

Critical infrastructure disruption can be caused by almost any hazard, but they can also occur because of human error or equipment failures. Electric, gas, telephone, and water are all important services to the campus that could become problematic should a long-term outage occur. Daily operation of the campus is dependent on a variety of services, including human resources, student records, administration, information technology, among many others. Should the structures of systems these services rely on fail, disruption would be immediately felt across the campus.

Critical infrastructure disruption can be caused by many hazard events. Anything from an earthquake to a terrorist event could cause infrastructure or services to be interrupted. Hazards that can rapidly compromise utility systems include earthquakes, severe summer weather, and severe winter weather. A wildfire in the region could disrupt the power supply if a major transmission line was burned and damaged. Vehicle accidents are possibly the most likely hazard to occur in the instance of electrical failure.

4.3.2 PROBABILITY AND MAGNITUDE

MSU has not experienced any critical infrastructure disruptions that can be considered disastrous. The probability of a major disruption to critical infrastructure in Gallatin County, the City of Bozeman, and on the MSU-Bozeman campus is certainly possible and considered to be moderate.

4.3.3 VULNERABILITIES

Potential utility interruption modes of failure caused by natural and man-made hazards include, but are not limited to:

- / Remote (off-campus) electrical grid failure
- / Campus primary electrical failure
- / Remote failure of natural gas distribution or transmission
- / Failure of backup heating fuel system
- / Loss of city water
- / Loss of sanitary sewer service

Other modes of failure exist, but these are primary to the function of the entire campus. In the event of loss of electricity or heat source during the winter, campus could be rendered uninhabitable and the property damage and lost research could be very extensive. Critical campus facilities and services are vulnerable to utility outages. Some critical campus facilities do have back-up generators in case of an electricity outage. Others, however, may have limited functionality following an event due to a utility failure. Facilities and services are also vulnerable to structure failures. Any disruption of critical campus facilities and services is expected to have an adverse economic impact on the university.

Without services such as heated shelters, food, and drinking water, the campus population could suffer. Significant casualties would not be expected since these services could be available in a nearby community. Necessary sheltering and feeding provisions would occur to protect population. Significant relocations of vulnerable populations and disruption of normal campus lifestyles would be expected.

4.3.4 OVERALL HAZARD PROFILE

	Probability of Major Disaster	Property Impact	Population Impact	Economic Impact	Overall Risk
Critical Infrastructure Disruption	Moderate	Moderate	High	Moderate	High (30)

4.4 CYBER THREATS

4.4.1 DESCRIPTION AND HISTORY

The broad reach of cyberspace is integral to educational institutions and is used daily to aid in communication and operations. This dependency leaves MSU vulnerable to interruption of service or functionality, which can be threatened during a cyber-attack. In many cases even a small, isolated attack can have widespread effects and cause major disruptions.

A cyberattack is malicious and deliberate attempt by an individual or organization to breach the information system of another individual or organization. Usually, the attacker seeks some type of benefit from disrupting the victim's network. Cyberattacks affect individuals, businesses, academic institutions and governmental agencies every day. The number of cyberattacks is escalating rapidly, having increased by nearly 400% between January 2016 and October 2017 (Cisco, 2018). The following are common types of cyberattacks:



- / **Malware:** A term used to describe malicious software, including spyware, ransomware, viruses, and worms. Malware breaches a network through a vulnerability, typically when a user clicks a dangerous link or email attachment that then installs risky software. Once inside the system, malware can do the following:
 - / Blocks access to key components of the network (ransomware)
 - / Installs malware or additional harmful software
 - / Covertly obtains information by transmitting data from the hard drive (spyware)
 - / Disrupts certain components and renders the system inoperable
- / **Phishing:** Phishing is the practice of sending fraudulent communications that appear to come from a reputable source. It is usually done through email. The goal is to steal sensitive data like credit card and login information, or to install malware on the victim's machine. Phishing starts with a fraudulent email or other communication that is designed to lure a victim. The message is made to look as though it comes from a trusted sender. If it fools the victim, he or she is coaxed into providing confidential information, often on a scam website. Sometimes malware is also downloaded onto the target's computer.
- / **Distributed Denial of Service (DDoS):** A distributed-denial-of-service, or DDoS, attack is the bombardment of simultaneous data requests to a central server. The attacker generates these requests from multiple compromised systems. In doing so, the attacker hopes to exhaust the target's Internet bandwidth and RAM. The ultimate goal is to crash the target's system and disrupt its business.
- / **Man-in-the-middle:** Man-in-the-middle (MitM) attacks, also known as eavesdropping attacks, occur when attackers insert themselves into a two-party transaction. Once the attackers interrupt the traffic, they can filter and steal data.

Two common points of entry for MitM attacks:

1. On unsecure public Wi-Fi, attackers can insert themselves between a visitor's device and the network. Without knowing, the visitor passes all information through the attacker.
2. Once malware has breached a device an attacker can install software to process all the victim's information.

/ **SQL Injection:** A Structured Query Language (SQL) injection occurs when an attacker inserts malicious code into a server that uses SQL and forces the server to reveal information it normally would not. An attacker could carry out a SQL injection simply by submitting malicious code into a vulnerable website search box.

/ **Zero-day exploit:** A zero-day exploit hits after a network vulnerability is announced but before a patch or solution is implemented. Attackers target the disclosed vulnerability during this window of time. Zero-day vulnerability threat detection requires constant awareness.

MSU and its students are regularly targeted in small-scale cyberattacks, including malware, ransomware, and phishing scams. No major attacks have occurred, though recent history indicates that universities are particularly vulnerable to attacks. In the past few years, institutions such as Harvard University, Penn State University, and the University of Maryland, among many others, have been targets of cyberattacks which resulted in significant data breaches.

4.4.2 PROBABILITY AND MAGNITUDE

As noted previously, small-scale cyberattacks occur every day, while significant attacks that result in extensive damage are rare. Universities are attractive targets for cyber-criminals, due to the large amount of personal data in their possession. Thus, the probability of a major incident is considered high.

4.4.3 VULNERABILITIES

The students, faculty, alumni, and any individuals associated with Montana State University are most vulnerable during a cyberattack. Most university attacks attempt to access databases containing personal information, such as names, birthdates, and Social Security numbers. This stolen information can be used to commit identity theft, which financially damages the victim. Infrastructure, critical facilities, and critical services such as human resources and payroll can also be affected, if attacks target their systems.

4.4.4 OVERALL HAZARD PROFILE

	Probability of Major Disaster	Property Impact	Population Impact	Economic Impact	Overall Risk
Cyber Threats	Moderate	Moderate	High	Moderate	High (30)

4.5 EARTHQUAKE

4.5.1 DESCRIPTION AND HISTORY

An earthquake is ground shaking and radiated seismic energy caused most commonly by a sudden slip on a fault, volcanic or magmatic activity, or other sudden stress changes in the earth. An earthquake of magnitude 8 or larger on the Richter Scale is termed a great earthquake. Fortunately, Montana has not experienced a great earthquake in recorded history.

4.5.2 PROBABILITY AND MAGNITUDE

A significant seismic event would directly affect campus buildings and utilities and those in the surrounding community. The amount of damage would be related to the location and intensity of the earthquake and each building's ability to withstand the impacts. The population would have little and mostly likely no warning prior to an earthquake, so the impact to that population could be great depending on the magnitude of the event.

4.5.3 VULNERABILITIES

In the worst-case scenario, an earthquake could cause serious structural damage or cause a building to collapse. Architectural damage may occur to nonbearing walls/partitions, exterior wall panels, veneer and finishes, mechanical penthouses, access floors, appendages and ornaments. Non-secured objects and building contents such as file cabinets, art and other valuable objects, laboratory equipment, bookcases, and computer and communication equipment can fall during an earthquake causing property damage or injury/fatality. Most earthquake-related injuries result from collapsing walls, flying glass, and falling objects, or people trying to move more than a few feet during the shaking.

Severe earthquakes can also damage non-flexible utilities such as natural gas, sewer, and water mains. Fire is the most common hazard to follow an earthquake due to broken gas lines. Earthquakes may disrupt emergency systems and falsely set off fire alarms and fire sprinkler systems. Water damage from broken water lines and sprinklers is another hazard following an earthquake. Earthquakes have the potential of causing hazardous materials incidents, not only from stored laboratory equipment, but from storage tanks and other materials used for campus operations. Buildings that predate current seismic code requirements are at risk to severe earthquake damage.

MSU-Bozeman officials are very aware of the potential impacts from earthquakes. In 2003, an 80-year-old 170-foot-tall, unreinforced brick smokestack was removed in order to prevent a potential collapse. The smokestack, designed in 1922 and considered a landmark, had the potential to shut down the entire university for up to a year if it collapsed. Chunks of the stack could have pierced the high-pressure boilers below that provide heat to the entire campus, causing a huge steam explosion. Dorms, classrooms and dining halls would freeze, students would be sent home, tuition money refunded, and MSU-Bozeman would be out of business for months ("Smokestack Must Come Down, MSU Officials Explain", Bozeman Daily Chronicle, January 25, 2003).

In 2001, the Renne Library was renovated which included seismic enhancements. Other campus buildings which have undergone seismic retrofits include Hamilton Hall (partial), Montana Hall (partial), Heating Plant, SUB, Plew Building, Brick Breeden Fieldhouse, and the Marga Hosaeus Fitness Center.

In 2012, MSU-Bozeman received a \$2.2 million grant from FEMA to seismically retrofit the Creative Arts Complex (Cheever, Haynes, and Howard Halls). Within the 2018-2019 Governor's Executive Budget, Long Range Building Program, MSU-Bozeman is requesting \$4,000,000 to conduct seismic upgrades that would stabilize the 3rd and 4th floors in Hamilton Hall.

4.5.4 OVERALL HAZARD PROFILE

	Probability of Major Disaster	Property Impact	Population Impact	Economic Impact	Overall Risk
Earthquake	Moderate	High	Moderate	Moderate	High (28)

4.6 ENVIRONMENTAL HAZARDS

4.6.1 DESCRIPTION AND HISTORY

Research and teaching institutions such as MSU-Bozeman are faced with unique hazards, due to the variety of hazardous materials and equipment used on campus. Examples include lasers, experimental electrical systems, equipment which releases radiation, and hazardous materials (detailed in the Hazardous Material Incidents section). Furthermore, many labs on campus utilize equipment which operates at high temperatures, is used to cut hard materials, or operates under a high-pressure system. Proper safety training is crucial for individuals who use or work near this equipment, though training does not guarantee an incident won't occur.

Other environmental hazards which effect the County overall may also occur on campus. These hazards include contaminated drinking water, lead poisoning due to drinking water distribution systems or paint, carbon monoxide poisoning, reduced air quality due to wildfire, and mold, among others outlined in the County HMP.

4.6.2 PROBABILITY AND MAGNITUDE

No major incidents involving environmental hazards have been recorded at MSU-Bozeman, though the potential certainly exists, considering the frequency with which potentially dangerous equipment is used.

The magnitude of an incident will vary depending on the nature of the hazard or equipment. MSU-Bozeman has well documented safety protocols and response plans. Thus, the magnitude of an event is expected to be limited.

4.6.3 VULNERABILITY

In most incidents the primary impact is to human life and health. MSU continually refines its safety plans and makes every effort to ensure labs are outfitted with safety equipment to prevent and minimize incidents.

Depending on the type of hazard, damage to buildings and infrastructure is possible. Smoke pollution from fires can damage HVAC equipment, a laser accident may weaken the structural integrity of building, and contaminated water may corrode pipes.

Any incident has the potential to impact the economic wellbeing of MSU-Bozeman, should the event attract publicity and cause students to become concerned for their safety.

4.6.4 OVERALL HAZARD PROFILE

	Probability of Major Disaster	Property Impact	Population Impact	Economic Impact	Overall Risk
Environmental Hazard	Moderate	Low	Moderate	Moderate	Moderate (20)

4.7 HAZARDOUS MATERIAL INCIDENTS

4.7.1 DESCRIPTION AND HISTORY

Hazardous materials are used and stored throughout the campus and can include petroleum products, laboratory chemicals, batteries, and compressed gas cylinders. Waste materials generated from labs and research may be hazardous and can include infectious waste, radiological waste, photographic and x-ray fixer waste, and chromatography waste. Building renovations also have hazardous material concerns associated with asbestos, lead-based paint, and mold. Most chemicals are stored on sturdy shelves with lips for protection against spillage from minor earthquakes. Petroleum storage is centralized and has secondary containment.

A hazardous material release is the contamination of the environment (i.e., air, water, soil) by any material that because of its quantity, concentration, or physical or chemical characteristics threatens human health, the environment, or property. Hazardous material incidents that have occurred at MSU-Bozeman are listed in Table 4-1 below.

Table 4-1. Hazardous Material Incidents at MSU-Bozeman

Date	Comments
9/1994	Students were evacuated from Gaines Hall when smoke came from the hazardous waste collection center in the building's basement. It was determined to not be a health danger (<i>MSU Ready to Move Hazardous Waste</i> , Bozeman Daily Chronicle, November 25, 1997).
2/17/2000	A student suffered minor burns and blisters on his elbow, lower legs and ankles when the bottom fell out of a gallon jug containing sulfuric acid. The student was treated and released at the Student Health Center. Emergency showers in the chemistry labs prevented further injury. The Bozeman Fire Department's Hazardous Materials team dispensed a neutralizer on the spill for cleanup to occur (<i>MSU Student Suffers Burns in Organic Chemistry Lab Spill</i> , Bozeman Daily Chronicle).
5/25/2000	An MSU-Bozeman janitor found a reddish-brown liquid covering the floors in three basement rooms in the Cooley Building which houses biology labs. The Bozeman Fire Department's Hazardous Materials team was called in to assist in the identification of the substance (<i>Chemical Spill Causes Stir at MSU</i> , Bozeman Daily Chronicle).
10/18/2001	A manager at the MSU-Bozeman food service in Hapner Hall found a package of tomatoes covered with a white powder. The Bozeman Fire Department's Hazardous Material team was called to determine whether a health concern existed. (<i>MSU Food Service Workers Get Scare</i> , Bozeman Daily Chronicle).
11/17/2010	One of MSU's largest buildings was closed after it was discovered that workers had been removing ceiling tiles for three weeks without proper precautions to prevent the possible release of asbestos. (<i>Asbestos Scare Closes MSU's Leon Johnson Hall</i> , Bozeman Daily Chronicle).
4/30/2018	MSU's Native American studies office was closed after an employee opened a letter and immediately became dizzy and nauseated. (<i>FBI, police investigate suspicious letter to MSU</i> , Bozeman Daily Chronicle).

MSU-Bozeman has developed a comprehensive hazardous materials management program to assist all laboratory and non-laboratory chemical and chemical product users in meeting the waste disposal and regulation guidelines adopted by the Montana Department of Environmental Quality (MDEQ). The SRM provides hazardous waste disposal services for the university. SRM provides information/assistance for compliance with other state and federal environmental or chemical use regulations as well as laboratory inspection guidelines, chemical hygiene plans, and laboratory safety training.

MSU-Bozeman has a program that outlines the requirements and responsibilities associated with the Occupancy/Vacancy of Laboratories on the MSU campus. Adherence to the guidelines is necessary to ensure the quality of laboratory facilities is maintained and to prevent hazardous material incidents. MSU also has a Chemical Safety Program, Waste Disposal Guidelines, and a Hazardous Material Policy. Waste containers are picked up regularly for disposal by a third-party vendor. SRM does not charge departments for hazardous waste disposal. It is an essential service that supports teaching, research, and the operation of the university. However, chemical users have the responsibility to purchase and manage chemicals in a prudent manner. Responsible parties are charged for unusually dangerous or expensive chemical disposal problems resulting from unwarranted purchasing, excessive quantities of chemicals, or poor management/storage of chemicals.

MSU-Bozeman has a Hazard Communication Plan, to ensure compliance with the updated OSHA Hazard Communication Standard, 29 CFR 1910.1200. The standard requires that all employees who work with Hazardous Chemicals (cleaning and industrial chemicals, laboratory chemicals, solvents or acids, mechanical fluids, etc.) be trained. MSU provides a 90-minute Hazard Communication course, every 3-4 weeks between February and December, which outlines the risks of exposure to chemicals, and the mitigating steps to work safely. Equivalent training is available online

The Bozeman Fire Department staffs one of six regional hazardous materials response teams in the state. The City of Bozeman and Gallatin County have partnered to provide Level A hazardous materials response and assist MSU-Bozeman as needed.

4.7.2 PROBABILITY AND MAGNITUDE

Hazardous materials incidents can cause death, serious injury, long-lasting health effects, and damage to campus property. The magnitude of any hazardous material event would depend on the amount and material spilled. Due to the number of hazardous materials events which have occurred at the MSU-Bozeman campus, but lack of major incidents, the probability of future events is rated as “moderate”.

4.7.3 VULNERABILITIES

The Emergency Planning and Community Right-to-Know Act (EPCRA) was enacted in 1986 to inform communities and citizens of chemical hazards in their areas. Sections 311 and 312 of EPCRA require businesses to report the locations and quantities of chemicals stored on-site to state and local governments in order to help communities prepare to respond to chemical spills and similar emergencies.

The volume and type of hazardous materials that flow into, are stored, and flow through communities will determine exposure to a potential release of hazardous materials. An accidental or intentional release of materials could produce a health hazard to those in the immediate area, downwind, and/or downstream.

HVAC systems, if not properly shut down or controlled during a hazardous material event, have the potential to distribute hazardous material fumes throughout the building. Proper use of a building’s HVAC system during both indoor and outdoor hazardous material releases can greatly reduce the impact of an event (Berkeley Lab, 2004).

4.7.4 OVERALL HAZARD PROFILE

	Probability of Major Disaster	Property Impact	Population Impact	Economic Impact	Overall Risk
Hazardous Material Incidents	Moderate	Low	Moderate	Low	Low (18)

4.8 REGULATORY COMPLIANCE RISK

4.8.1 DESCRIPTION AND HISTORY

Universities are regulated under a variety of authorities. MSU-Bozeman must ensure it is complying to a myriad of regulations, including federal, civil rights, privacy and information security, international, environmental, and financial. Ensuring compliance is a monumental task, especially as regulations are subject to frequent change. A recent study found that regulatory compliance accounts for 3 to 11 percent of higher education institutions’ operating expenses (Vanderbilt University, 2015).

It should be noted maintaining compliance is not enough in many cases to ensure the university follows best practices to protect the health and safety of its many students, staff, and other participants. The Virginia Tech shooting, detailed in the Active Killer Section (4.1), offers an example of such a scenario. In the aftermath of the shooting, many criticized the university for its perceived failings before and during the incident, despite evidence the university followed all applicable regulations at the time.

Maintaining compliance and ensuring best safety practices requires proactive planning and coordination across campus. MSU-Bozeman strives to meet these ideals through a variety of mechanisms, including multi-disciplinary teams.

4.8.2 PROBABILITY AND MAGNITUDE

Failure to maintain compliance could have disastrous effects on the university. In extreme cases, the university could be forced to close. In other cases, the university may lose accreditation, thereby severely eroding the usefulness of the degrees it confers. In less extreme scenarios, the university may be faced with fines and other penalties.

As regulatory and operational complexity increases so does the likelihood of an accidental lapse in compliance. In the near-term, the probability is considered moderate, due to the large number of rules and regulations to which the university must comply.

4.8.3 VULNERABILITIES

Regulatory compliance failures have the greatest impact on human health, safety, and quality of life, as well as the economic feasibility of the university. Students, staff, and faculty rely on university to ensure a safe environment. Additionally, students choose MSU-Bozeman with the expectation they will receive a quality education which will serve them well throughout the rest of their life. Failing to meet regulations associated with these factors therefore negatively impacts students.

MSU-Bozeman would be financially vulnerable, should a regulatory compliance failure occur. The university is dependent on tuition and federal, state, and local monies to maintain operation. Should a failure cause any one of these financial sources to become interrupted or rescinded, the university may not be able to continue to operate effectively.

4.8.4 OVERALL HAZARD PROFILE

	Probability of Major Disaster	Property Impact	Population Impact	Economic Impact	Overall Risk
Regulatory Compliance Risk	Moderate	Low	Moderate	Moderate	Moderate (20)

4.9 SEVERE WEATHER

4.9.1 DESCRIPTION AND HISTORY

Severe weather encompasses both summer and winter weather events, which are detailed in the sections below.

4.9.1.1 SEVERE SUMMER WEATHER

Severe summer weather includes thunderstorms, wind, hail, lightning, tornadoes, and microbursts that typically occur between May and October of each year.

MSU-Bozeman has experienced severe summer weather in the past, most recently in the form of a severe hail event in 2010 which caused significant damage to campus buildings. This event is described below.

June 30, 2010: A large hailstorm struck Bozeman and the Gallatin Valley on June 30, 2010. Golf ball-sized hail started pounding Bozeman around 4:00pm and continued to fall for about a half hour. The MSU campus was directly in the path of the hailstorm, which bombarded building, cars and people with hailstones up to 2.5 inches across. The hail broke 800 to 1,000 windows on campus. Windows located on west- and south-facing walls suffered the most damage. Most of the windows on the west side of Roberts Hall were broken, along with numerous windows in the North and South Hedges, two of the university's high-rise residence halls. The hailstorm resulted in over \$60 million in damages from repair to windows, roofs and tree damage on the campus and elsewhere in Gallatin County. The total damage at MSU-Bozeman was \$8,864,985 including the amount reimbursed by insurance.

Additional severe summer weather events on the MSU-Bozeman campus are presented in Table 4-2. Except as otherwise noted, the source of this data is from the Montana Department of Administration (MDOA), Risk Management and Tort Defense, Property Casualty Insurance Information System (PCIIS).

Table 4-2. Severe Summer Weather at MSU-Bozeman

Date	Comments
Undated	A violent thunderstorm caused a breach in an asbestos remediation project in Roberts Hall on the MSU-Bozeman campus (2007 PDM Plan Public Meeting).
5/5/1995	The Animal Science Building on the MSU-Bozeman campus sustained \$7,081 in damages due to lightning.
6/16/1995	Thunderstorm winds blew part of the roof off the city fairgrounds grandstand. Roof damage was also reported at the Fine Arts Center on the MSU-Bozeman campus. A gust of 68 mph was recorded at the National Weather Service office in Bozeman (NCDC, 2013).
7/29/1995	Two buildings on campus sustained wind damage.
8/25/1995	Lightning hit the Chemistry Building on the MSU-Bozeman campus causing \$4,420 in damages.
5/31/1997	High winds caused \$6,436 in damages to the tennis bubble on the MSU-Bozeman campus.
7/3/1998	A hailstorm caused \$48,112 in property damage to a campus building.
6/8/1999	Wind caused roof damage to a campus building.
8/4/1999	Lightning damaged phone equipment on the MSU-Bozeman campus causing \$17,680 in damages.
8/29/1999	The stadium scoreboard on the MSU-Bozeman campus was damaged by lightning.
9/24/1999	High winds caused \$3,517 in damages to the campus tennis bubble.
8/4/2000	A campus radio transmitter was struck by lightning causing \$9,499 in damages.
9/1/2000	High winds caused a tree to fall onto Traphagen Hall causing \$12,705 in damages.
4/20/2001	High winds caused \$24,655 in roof damage to a campus building.
6/30/2001	A storage trailer on campus was damaged by hail.
7/28/2001	A transformer and power pole on campus was damaged by high winds.
6/21/2002	Lightning caused a campus fire alarm system to malfunction causing \$5,736 in damages.
9/12/2003	A tent on campus sustained \$11,800 in damages due to high winds.
5/13/2007	Hail caused \$64,146 in roof damage to greenhouse panels.
5/17/2007	Fencing blow over at tennis courts causing \$12,980 in damages.
7/4/2008	Lightning caused \$5,795 in damage to electrical and phone systems on campus.
7/18/2008	Hail caused a broken greenhouse panel.
7/22/2008	Major rain/hail event flooded campus causing \$250,000 in property damage.
8/29/2011	Power outage from storm caused \$600 in damages to autoclave.

4.9.1.2 SEVERE WINTER WEATHER

Severe winter weather includes several weather conditions that occur from late fall through early spring (November through April). Winter storms have the potential to destroy property and kill livestock and people. Winter storms may be categorized as sleet, ice storms or freezing rain, heavy snowfall or blizzards, and low temperatures. Blizzards are most commonly connected with blowing snow and low visibility. Winter also brings sustained straight-line winds that can be well over 50 mph.

4.9.2 PROBABILITY AND MAGNITUDE

Summer storms, snowstorms and bitterly cold temperatures are common occurrences in the City of Bozeman and MSU campus and generally do not cause any problems. Severe summer weather affects areas with significant tree stands, as well as areas with exposed property, major infrastructure, and aboveground utility lines. Severe hailstorms can also cause considerable damage to buildings and automobiles, but rarely result in loss of life. Blizzards can occur and overwhelm the ability to keep roads passable. Heavy snow and ice events also have the potential to bring down power lines and trees. Extreme wind chill temperatures may harm residents if unprotected outdoors or if heating mechanisms are disrupted.

The history of severe weather events in the City of Bozeman, Gallatin County, and on the MSU-Bozeman campus indicate that they occur more than once per year. Therefore, the probability of this hazard occurring in the future is rated as "high".

4.9.3 VULNERABILITY

Structures, utilities, and vehicles are most at risk from severe weather. Windstorms can break power poles and damage roofs. Windstorms can uproot trees and break large limbs potentially causing damage to surrounding structures when they fall. Large amounts of debris left in the path of a windstorm can block routes potentially delay emergency response vehicles.

Severe hailstorms also cause considerable damage to buildings and automobiles, but rarely result in loss of life. Damages from hailstorms in Gallatin County have included broken windows on homes, power outages, and vehicular damages. Large windows are vulnerable to shattering during hailstorms causing property damage and personal injury. Hailstorms accompanied by high winds can cause more severe damage than hail alone. Damage to siding and roofing often occurs during severe hailstorms. Buildings with asphalt shingles are the most vulnerable to hail damage whereas those with tile shingles or metal roofs are considered hail-resistant.

Structures at MSU-Bozeman are constructed to withstand reasonable snow loads. The greatest risk to MSU-Bozeman during winter weather events are loss of power and the potential for frozen pipes during extended extreme cold temperatures. Frozen water lines would hinder the steam plant's ability to provide heat to campus buildings creating an exposure hazard. Frozen water lines during extreme cold spells may also hinder firefighting efforts on campus.

Since winter storms and cold spells typically do not cause major structural damage, the greatest threat to the population is the potential for utility failure during a cold spell. Although cold temperatures and snow are normal in Bozeman, handling the extremes can go beyond the capabilities of the community. Should the temperatures drop below -15 F for over 30 days, or several feet of snow fall in a short period of time, the magnitude of frozen water pipes and sewer lines or impassable streets could result in disastrous conditions for many people. If power lines were to fail due to snow/ice load, winds, or any other complicating factor, the situation would be compounded.

Sheltering of the campus population could present significant logistical problems when maintained over a period of more than a day. Transportation, communication, energy (electric, natural gas, and vehicle fuels), shelter supplies, medical care, food availability and preparation, and sanitation issues all become exceedingly difficult to manage in extreme weather conditions. Local government resources could be quickly overwhelmed. Mutual aid and state aid might be hard to receive due to the regional impact of this kind of event.

According to the MSU Facilities Services manual, there are over 25 miles (18 acres) of sidewalks that must be cleared after each snow event, nearly five miles of streets that need snow removal and traction treatment, some 200 building entries need to be shoveled, and there is only one crew centered around a single shift for snow removal—it is not a 24-hour operation.

According to Facilities Services’ Snow Removal Policy, each semester, disabled students are asked to identify the routes that they take to reach their classes on campus maps. Landscape and Grounds then makes every effort to make sure that those routes are given top priority in the snow removal process. Equal in priority, and often coinciding with the disabled routes, are the main pedestrian and vehicular circulation routes. Particular attention is given to known problem areas, such as hills or places where melt water forms ponds which turn to ice, and these are checked periodically throughout the shift.

To help make the campus paved surfaces as safe as possible, street sanding operations take place three to four times per day when icy conditions exist. Sidewalks are sanded about half as frequently as are the street intersections. During particularly icy conditions, all sidewalks are sanded twice per day, and problem areas are sanded more often. Even when weather and surface conditions are relatively static, street intersections and sidewalks are checked for excessively slippery conditions several times daily. Safety and Risk Management has a Cold Weather Precautions Policy designed as a preventative measure to reduce risks of property damage to MSU buildings resulting from periods of cold and snowy weather. In general, the trigger point for inspection and cold weather prevention activities is < 20 F. The policy places responsibility for extra notification to occupants prior to significant cold weather events with SRM. SRM is responsible for confirming with the various user groups, Facilities Services, Residence Life, Family Housing, and Sports Facilities, their cold weather procedures will be adhered to prior to winter and significant cold weather events. Procedures for implementing precautionary cold weather measures vary dependent on the facility and its use. In general, this policy reminds users to look at the building envelope for weather tightness, and also to check for clear and functional drainage systems, functional louvers and dampers, drained and/or antifreeze protected water systems, functional heating systems, extra portable heaters if necessary, and proper signage to make sure occupants remember to leave items like doors to unheated spaces, and fume hood sashes, partially open.

4.9.4 OVERALL HAZARD PROFILE

	Probability of Major Disaster	Property Impact	Population Impact	Economic Impact	Overall Risk
Severe Weather	High	Moderate	High	Low	High (42)

4.10 STRUCTURE FIRE

4.10.1 DESCRIPTION AND HISTORY

Structure fires have many causes including smoking, arson, industrial accidents, electrical malfunctions, laboratory accidents, and lightning. Fires also occur as a secondary effect of an earthquake when inflexible gas lines rupture. A large fire has the potential to cause high casualties and can result in secondary impacts such as hazardous material release and damaged utilities. Older buildings that were constructed without fire evacuation routes are at a higher risk for casualties.

Residence halls are at the highest risk to structural fire due to students living near each other and being engaged in activities that can cause fires. Residence hall fires are often ignited by faulty appliances, lamps, overloaded outlets, smoking, cooking or candles. According to the National Fire Protection Association (NFPA), the number of reported fires in dormitories increased 23 percent from 3,200 in 1980 to 4,180 in 2015. Since 2003, annual estimates have ranged from a low of 3,350 fires to a high of 4,230 in 2014. During the five-year period 2011-2015, U.S. fire departments responded to an estimated annual average of 4,100 structure fires in dormitories, fraternities, sororities, and barracks. These fires caused an annual average of 35 injuries, and \$14 million in property damage. Structure fires in dormitories, fraternities, and sororities are more common during the evening hours between 5 - 9 pm, and on weekends. More than two-thirds (72%) of these fires began in the kitchen or cooking area. Only 7% of fires in these properties began in the bedroom, but these fires accounted for almost one-quarter of the injuries. (NFPA, 2017).

Fire safety is essential in protecting a campus community from injuries, deaths, business interruption, and property damage resulting from fires. To standardize the information an institution publishes on fire safety, the U.S. Department of Education requires all universities that maintain on-campus student housing facilities and receive federal funding to publish an annual fire safety report, maintain a fire log, and report fire statistics to the Secretary of Education. The MSU-Bozeman fire report is provided in Table 4-3.

Table 4-3. MSU-Bozeman Fire Log (Montana State University, 2018)

Date	Location	Comments
10/5/2010	South Hedges Hall	A burned piece of paper was taped to the South Hedges south elevator.
4/5/2010	Roskie Hall	A cigarette butt had burned a hole in a garbage can located on the 5 th floor.
1/16/2010	Roskie Hall	A corner of a door decoration on the fifth floor was singed as was part of the door.
3/9/2010	Roskie Hall	There was a small burn on a door decoration on the sixth floor.
3/17/2010	Johnstone Center	A student possession had caught on fire and burned a hole in the carpet.
10/26/2011	Langford Hall	A singed poster was found on the exterior of the building.
1/23/2012	South Hedges Hall	Staff member discovered a singed door decoration during routine rounds.
2/7/2012	Roskie Hall	Student employee observed a resident's attempt to light a doorknob on fire.
1/29/2012	North Hedges Hall	A student staff member found a trash can outside the building with a melted bag inside.
2/15/2012	Roskie Hall	Staff members discovered a signed door decoration during routine rounds.
3/4/2012	Peter Koch Tower	There was a small stovetop fire.
3/6/2012	North Hedges Hall	Staff members discovered a singed door decoration during routine rounds.
3/7/2012	North Hedges Hall	Staff members discovered a singed door decoration during routine rounds.

Date	Location	Comments
3/24/2012	North Hedges Hall	Staff members discovered a poster with a singed corner during routine rounds.
4/5/2012	North Hedges Hall	Staff members discovered black smoke marks inside east and west elevators.
4/10/2012	North Hedges Hall	Staff members discovered black smoke marks inside an elevator.
4/15/2012	North Hedges Hall	Staff members discovered a poster with a singed corner during routine rounds.
9/14/2012	Quad A	Staff members discovered a partially burned poster during routine rounds.
10/8/2012	Roskie Hall	There was a stove top fire in the kitchen.
10/16/2012	South Hedges	Staff members discovered a singed poster on a door.
11/11/2012	Roskie Hall	Staff members discovered burned posters on the 3 rd floor during routine rounds.
11/25/2012	North Hedges Hall	Staff members discovered a poster on the 6 th floor with a burned corner during routine rounds.
11/27/2012	North Hedges Hall	Staff members discovered a poster on the 6 th floor with a burned corner during routine rounds.
11/30/2012	North Hedges Hall	Staff members discovered a burned door decoration on the 5 th floor during routine rounds.
12/10/2012	Roskie Hall	A staff member on the third floor found burn marks in the ceiling by the elevator.
12/12/2012	Roskie Hall	Several items were found to be burned on the 2 nd floor.
1/25/2013	Roskie Hall	A staff member found the bulletin board between the elevators on the 3 rd floor singed.
1/27/2013	Roskie Hall	A staff member noticed "FEALTH" burned into the ceiling in the 3 rd floor public area.
2/7/2013	Roskie Hall	"S" burned into the ceiling in the 8 th /9 th pink stairwell.
4/1/2013	Roskie Hall	"Murica" burned into the ceiling of the blue 3 rd floor stairwell.
10/4/2013	Quad F	Two residents burned a piece of paper in the hallway.
11/3/2013	Langford Hall	Resident started small grease fire in oven. It was extinguished before staff responded.
11/18/2013	South Hedges Hall	Burnt poster on the SE door of the South Bathroom of 11th floor, the door was burnt as well. Burnt paper in the fire extinguisher box of the SE hallway of 11th floor. Burn marks on the ceiling surrounding a particle detector in the south end of 11th floor.
2/12/2014	South Hedges	11th Floor SE Bathroom, Poster Burned.
4/27/2014	Quad B dumpster	Residents put hot coals in dumpster after BBQ event and caught the dumpster on fire melting the dumpster lid.
7/2/2014	Madison Hall	Pizza boxes in kitchen oven caught fire. Residents put it out with the fire extinguisher.

Date	Location	Comments
11/9/2014	Johnstone Center	Resident had poster on his door with a burned corner.
12/4/2014	Langford Hall	A small explosion in a resident room as a result of a flammable substance from an aerosol can being exposed to an open flame from a BIC lighter.
2/2/2015	Johnstone Center	Burnt corner of a poster in 2nd Floor main stairwell of Pryor Wing.
3/1/2015	Freshmen Apartments	Freshman Apartment 101A had outside door decoration that was half burned.
8/14/2015	Roskie Hall	Burn holes in ceiling tiles of 6th Floor Teen Pods. Specific Date of incident is unknown.
10/21/2015	Roskie Hall	Poster located in 2nd floor stairwell had a one-inch triangular burn at bottom middle of sign.
11/1/2015	Freshmen Apartments	A minor fire outside apartment building 113 (West Julia Martin) in the back seat of a vehicle. The cause of fire was undetermined.
1/1/2016	Langford Hall	Burned rubber strip and painted wall.
2/6/2016	Langford Hall	Langford Hall Room 211 had outside door decorations that were burned, and door/carpet had scorch marks.
3/5/2016	Madison Hall	Grease on tin foil covering stove top burner caught fire. Resident put it out with the fire extinguisher.
5/2/2016	South Hedges Hall	Burned corner of poster on 8 th floor.
11/7/2016	Freshmen Apartments	Apartment had a couch set on fire by a burning paper towel under it. Undetermined who set the fire, but the residents put it out before it could do any damage to the building.
1/18/2017	Freshmen Apartments	Pillow was placed on electric stove causing a fire in Freshman Apartment 113A.
7/26/2017	Paisley Court	Stove top fire – food caught fire in pan and singed wall. Tenant put out fire with extinguisher.

4.10.2 PROBABILITY AND MAGNITUDE

Most campus fires are small and are confined to burning contents within a building without sustaining major damage to the building itself. This does not however, preclude the possibility of a large-scale structure fire on the MSU-Bozeman campus. As such, the probability of future events is rated as moderate.

4.10.3 VULNERABILITIES

Existence of building sprinkler systems are the primary factor that determines the vulnerability from and overall impact of structural fires. All residence halls on campus have fire suppression systems in place. Numerous older buildings on campus do not have sprinklers and are at risk to structure fire. MSU-Bozeman has centralized gas shutoff valves for each zone on campus which decreases the risk of fire on the campus.

Most buildings on campus have fire and smoke detection alarm systems. Campus buildings are inspected for fire and life safety on a periodic basis. All hydrants on campus have upgraded fire department connections and are flow tested annually.

Fire drills are routinely practiced. Within the residence halls, fire drills are conducted in each building at the beginning of each academic period. Fire drills are unannounced and assist in the educational process for students and staff alike.

Fire evacuation procedures are outlined on the campus website. Resident Assistants explain the evacuation procedures to residents at the first-floor meeting of each academic semester, including discussion of evacuation plans posted at each floor exit door. Residents are directed to exit through the nearest safe exit route/stairwell and are informed of the exterior hall meeting location for students.

Students are required to evacuate any residence hall immediately upon the sound of an alarm and may not re-enter until authorized by University personnel. During the alarm, front desk personnel document the fire alarm and evacuation progress. Residence Life Senior Staff members facilitate the fire panel and direct residence life staff during the alarm. Residents are not permitted to re-enter until Residence Life staff, fire department personnel, and/or University Police give authorization.

All residence halls are equipped with portable fire extinguishers and Resident Assistants attend and complete fire extinguishing training and fire evacuation simulation each academic year.

In family and graduate housing, tenants are required to attend a check-in appointment within one week of their move into their apartment. During this meeting, tenants are given instructions on responding to a fire. A Fire Safety Brochure is delivered to all tenants during the week of welcome (September 1-15). This provides information for new tenants and a refresher for existing tenants. "Exit Drills in the Home" education materials provided by NFPA are provided to the tenants. In addition, a Safety Fair is held within first two weeks of fall semester, featuring fire safety along with a variety of other safety related topics.

MSU-Bozeman has two policies to mitigate the effects of structure fire, both involving oversight by the MSU Fire Marshal. The Pre-Fire Planning Policy indicates that Emergency Response Plans (ERP), available for all the assembly, academic, dormitories and research buildings at MSU, are reviewed during the spring and summer every year and that occupant training in the form of fire drills is conducted annually. The Fire Protection Equipment Impairment Testing Policy oversees, testing and maintenance scheduling, record keeping, maintenance, and repair of MSU's fire protection equipment by properly certified and licensed individuals. This equipment includes: alarm panels, associated indicating devices, detection devices, occupant notification devices, and fire doors; water-based fire sprinkler systems; fire pumps; clean agent extinguishing systems; dry chemical fixed extinguishing systems; portable fire extinguishers; kitchen hood extinguishing systems; standpipes and hose connections; and, fire hydrants.

4.10.4 OVERALL HAZARD PROFILE

	Probability of Major Disaster	Property Impact	Population Impact	Economic Impact	Overall Risk
Structure Fire	Moderate	Moderate	Low	Low	Low (16)

4.11 TERRORISM, CIVIL UNREST AND VIOLENCE

4.11.1 DESCRIPTION AND HISTORY

Terrorism, civil unrest, and violence are human caused hazards that are intentional and often planned. Terrorism events that could potentially affect the campus are cyber-attacks, armed attacks, car bombs, or a chemical, biological, or nuclear attack. Terrorists might also target large public gatherings, such as campus sporting events.

MSU University Police are proactive in assessing vulnerabilities and threats to student and staff safety on campus and enforce both law and university policy on campus and within university jurisdiction in the surrounding community. Initiatives by university police designed to foster individual safety and protect property include organizing, training and supervising a Student Security group. Student Security provides additional "eyes and ears" for university police as they patrol parking lots and other areas of the campus during hours of darkness and provide escorts for persons requesting such from university buildings to residences and personal transportation. University police have installed surveillance cameras for residence hall parking lots which have resulted in an increase in property crimes solved, and an anonymous telephone tip line allows any person to report a crime or suspected crime at any time. University police officers receive special training in investigative techniques, and detectives are specially trained in sexual assault response and investigation.

Violence on college campuses is common. The U.S. Department of Justice indicates that college students ages 18 to 24 experienced violence at average annual rates lower than those for non-students in the same age group (61 per 1,000 students versus 75 per 1,000 non-students). Except for rape/sexual assault, average annual rates were lower for students than for non-students for each type of violent crime measured (robbery, aggravated assault, and simple assault). Rates of rape/sexual assault for the two groups did not differ statistically.

In recent years, hate crimes have occurred on many college campuses. Hate crimes occur when a perpetrator targets a victim because of his or her perceived membership in a certain social group. Examples of such groups include but are not limited to racial group, religion, sexual orientation, ethnicity or gender identity. Incidents may involve physical assault, damage to property, bullying, harassment, verbal abuse or insults, or offensive graffiti or letters (hate mail).

4.11.2 PROBABILITY AND MAGNITUDE

The effects of terrorism can vary significantly from loss of life and injuries to property damage and disruptions in services such as electricity, water supply, public transportation, and communications. There is a lack of history of local terrorism, though minor acts of violence are frequent on campuses. Due to these factors, the probability of an incident of terrorism, civil unrest, or violence is considered "moderate."

4.11.3 VULNERABILITIES

The origins and targets for terrorism and civil unrest are difficult to predict. Individuals or groups that feel oppressed on any issue can resort to violent acts to inflict harm and damage to gain publicity or affect

policy. The locations of these attacks can occur anywhere but often the symbols that represent a threat to their cause are often the target.

Terrorist attacks have the potential to affect structures, infrastructure, and human life. If a large explosion was to occur on campus the effects could be devastating. This is especially true if an attack was planned to coincide with an event that concentrated a large population in a single structure.

MSU-Bozeman currently checks student identification for building access after class hours. The Residence Hall Security Policy describes the specific security policies for each of the residence halls, including policies pertaining to lock-down, escort requirements and check-in policies. MSU-Bozeman has a policy for reporting suspicious activity and a policy for bomb threats.

4.11.4 OVERALL HAZARD PROFILES

	Probability of Major Disaster	Property Impact	Population Impact	Economic Impact	Overall Risk
Terrorism, Civil Unrest and Violence	Moderate	Low	Moderate	Moderate	Moderate (20)

4.12 VOLCANIC ERUPTION

4.12.1 DESCRIPTION AND HISTORY

Volcanic eruption is generally not a major concern in Montana due to the relatively low probability (compared with other hazards) of events in any given year. However, Montana is within a region that has significant potential for volcanic activity.

The distribution of ash from a violent eruption is a function of the weather, particularly wind direction and speed and atmospheric stability, and the duration of the eruption. As the prevailing wind in the mid-latitudes of the northern hemisphere is generally from the west, ash would typically be spread eastward from a volcanic eruption. Exceptions to this rule do, however, occur. Ash fall, because of its potential widespread distribution, offers some significant volcanic hazards.

4.12.2 PROBABILITY AND MAGNITUDE

There are no active volcanoes in Gallatin County but an eruption hundreds of miles away can cause volcanic ash to be deposited on the MSU-Bozeman campus potentially causing health impacts and property damage. Due to the low frequency of large volcanic eruptions nearby, the probability is considered "low."

4.12.3 VULNERABILITY

Volcanic ash can cause failure of electronic components, interrupt telephone and radio communications, and cause internal combustion engines to stall. Airborne particles of volcanic ash can pose a health risk to people with respiratory conditions. Volcanic ash has the following effects (USGS, 2003):

- / Short-circuits and failure of electronic components, especially high-voltage
- / circuits and transformers (wet ash conducts electricity).
- / Eruption clouds and ashfall commonly interrupt or prevent telephone and radio communications.

- / Volcanic ash can cause internal-combustion engines to stall by clogging air filters and damaging moving parts. Engines of jet aircraft have suddenly failed after flying through clouds of even thinly dispersed ash.
- / Roads, highways, and airport runways can be made treacherous or impassable because ash is slippery and may reduce visibility to near zero. Cars driving faster than 5 miles per hour on ash-covered roads stir up thick clouds of ash, reducing visibility and causing accidents.
- / Ash also clogs filters used in air-ventilation systems to the point that airflow often stops completely, causing equipment to overheat.
- / Crop damage can range from negligible to severe, depending on the thickness of ash, type and maturity of plants, and timing of subsequent rainfall.
- / Like airborne particles from dust storms, forest fires, and air pollution, volcanic ash poses a health risk, especially to children, the elderly, and people with cardiac or respiratory conditions, such as asthma, chronic bronchitis, and emphysema.

4.12.4 OVERALL HAZARD PROFILE

	Probability of Major Disaster	Property Impact	Population Impact	Economic Impact	Overall Risk
Volcanic Eruption	Low	High	High	Moderate	Low (17)

4.13 FUTURE DEVELOPMENT

Land use and development trends at MSU-Bozeman include the construction of new buildings to respond to campus needs, and upgrading buildings, infrastructure and critical facilities to better protect life safety, address environmental concerns and minimize property damage from hazard events. MSU-Bozeman follows Engineering Guidelines (MSU, 2018h) when planning new buildings. Hazard mitigation is integrated into these guidelines and standards to reduce the effects of hazards on new buildings and infrastructure.

Much future development is planned for the MSU-Bozeman campus. The Long-Range Building Plan for the MSU-Bozeman campus can be viewed at <http://www.montana.edu/lrcdp/>. The plan outlines the planning process, and outlines development projects planned for completion within the next 25 years.

5.0 MITIGATION STRATEGIES

Hazard mitigation, as defined by DMA 2000, is any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards. The development of a mitigation strategy allows the campus to create a vision for preventing future disasters, establish a set of mitigation goals, prioritize actions, and evaluate the success of such actions.

Specific mitigation goals and projects were developed for the MSU-Bozeman campus in 2007 in conjunction with a Hazard Profile Survey, public meeting and stakeholder interviews. A matrix developed for project ranking, emphasizing cost-benefit and input from the campus Advisory Committee, was used to determine project priority. A mitigation action plan was developed as part of the 2013 MSU-PDM Plan update to capture progress made towards project implementation and planned activities to accomplish the high-priority mitigation projects. This 2018 Annex to the county's HMP update provides a 5-year update of project implementation since 2013, and it describes and prioritizes new projects to be considered for implementation to mitigate identified hazards.

A description of the goals and objectives that were identified to mitigate natural, human-made and technological hazards, and a summary of the changes made (additions, deletions, etc.) to the mitigation project list, follows. Project implementation and the legal framework to support these proposed actions are discussed at the conclusion of this section.

5.1 GOALS, OBJECTIVES, AND PROPOSED ACTIONS

The goals describe the overall direction that MSU-Bozeman can take to work toward mitigating risk from natural, human-made and technological hazards. The 10 primary goals included in the 2013 MSU-PDM Plan update are retained in the 2018 Annex. The 2013 Plan update focused on the existing mitigation strategy established in the original 2007 PDM Plan, with an emphasis on planned implementation of the high-priority projects.

No new objectives were added to the 2018 Annex, however two of the mitigation objectives from the 2013 update have been deleted in the 2018 Annex because the projects included for those objectives have been completed. The deleted objectives, and projects completed under those objectives include:

- / Objective 3.2: Protect Academic Research and Reduce Loss of Intellectual Property.
 - Project 3.2.1: Establish policy for management of research documentation. (*completed; HYALITE Computer and Storage Cluster installed in December 2014*)
- / Objective 6.1: Ensure Protection for Hazardous Materials from Hazard Events.
 - Project 6.1.1: Maintain detailed inventory/database and centralized data management of hazardous chemicals on campus and create GIS layer. (*completed; the data inventory system is implemented and went "live" in Fall 2018*)

This 2018 Annex updates the 2013 Plan's mitigation strategy with several new projects identified as well as deletion of mitigation projects that have been completed. The following is a list of new projects identified under existing objectives:

- Project 1.3.4: Install Waterbugs in research buildings and other critical locations to detect water breaks and leaks.
- Project 1.3.5: Install Central Heating Plant back-up fuel storage replacement.
- Project 5.1.17: Protect IT systems from all hazards by utilizing cloud-based storage; develop cloud-based phone bank for use during disasters.
- Project 5.1.18: Identify critical university assets and develop a Continuity of Operations Plan (COOP).
- Project 5.1.19: Replacement of various back-up generators; includes Central Heating Plant back-up generator.
- Project 5.1.20: Develop centralized primary electric generators.
- Project 5.2.5: Develop Campus Evacuation Procedure.
- Project 5.2.6: Procure vehicle for animal transport during evacuation.
- Project 5.3.8: Update and improve the existing Emergency Operations Plan (EOP).
- Project 8.1.3: Identify and procure cameras for campus.

Several other projects that appeared in the 2013 MSU-PDM Plan update have either been completed or will not be pursued further as mitigation projects. These include:

- Project 1.2.2: Develop a campus-wide strategy to implement non-structural mitigation practices.
- Project 1.3.2: Develop plans to prevent water damage to voice and data electronic equipment and cabling.
- Project 2.1.2: Consider alternate fire suppression for central library and computer facilities.
- Project 3.1.2: Establish off-site storage for tape backup of IT and Telecommunications systems.
- Project 3.1.3: Implement digital archiving by securing necessary equipment.
- Project 5.1.2: Inventory and prioritize water and sewer lines that need to be upgraded.
- Project 5.1.7: Prioritize buildings for emergency generators and install pigtail connections for mobile generator.
- Project 5.1.8: Obtain at least three mobile generators for campus critical facilities.
- Project 5.1.11: Evaluate campus buildings for suitability as emergency shelters.
- Project 5.1.14: Create a GIS layer of campus utilities and tie into City system
- Project 5.1.17: Protect IT systems from all hazards by utilizing cloud-based storage; develop cloud-based phone bank for use during disasters.
- Project 5.1.18: Identify critical university assets and develop a Continuity of Operations Plan (COOP).

- Project 5.1.19: Replacement of various back-up generators; includes Central Heating Plant back-up generator.
- Project 5.1.20: Develop centralized primary electric generators.
- Project 5.2.3: Install signage marking evacuation routes from campus buildings.
- Project 5.2.5: Develop Campus Evacuation Procedure.
- Project 5.2.6: Procure vehicle for animal transport during evacuation.
- Project 5.3.3: Develop University-wide post-disaster recovery plan.
- Project 5.3.5: Conduct training exercises on a regular basis.
- Project 5.3.7: Develop Utilities Continuity Plan.
- Project 5.3.8: Update and improve the existing Emergency Operations Plan (EOP).
- Project 6.1.2: Establish protection/security of fuel storage facility.
- Project 6.1.3: Identify specific non-structural mitigation projects for hazardous materials.
- Project 7.1.6: Maintain Emergency Disaster and Recovery Instructions in the MSU-Bozeman Telephone Directory.
- Project 8.1.1: Install enhanced building security (card access, cameras, blue light emergency telephone).
- Project 8.1.3: Identify and procure cameras for campus.
- Project 10.1.1: Conduct landscape inventory to evaluate potential vulnerabilities.
- Project 10.1.2: Develop standards for tree/landscape maintenance.

5.1.1 CREATIVE ARTS COMPLEX SEISMIC RETROFIT

The Creative Arts Complex Seismic Retrofit is a significant mitigation project that was completed on the MSU-Bozeman campus since the 2013 PDM update in 2013. Built in 1974, the Creative Arts Complex consists of Haynes, Cheever and Howard Halls and houses the College of Arts and Architecture, School of Art and the School of Music, and College of Agriculture and Technology Education programs, as well as campus Registrar-scheduled classrooms and lecture/performance halls.

These three concrete frame buildings (see photos, below) were all designed and built simultaneously, and as such have very similar structural systems. The buildings are in good condition but were constructed prior to the current day modern seismic building codes, and the upgrades to be constructed within this project were for the purpose of improving their structural performance during a major seismic event.

Construction was completed in the summer of 2013 for Howard and Cheever Hall's, and summer of 2014 for Haynes Hall. The reason for phasing the seismic project over two summers was to accommodate the fall school schedule as this project involves a tremendous amount of demolition in and around the buildings. The structural elements that were added to the buildings included complete removal and replacement of interior CMU walls, addition of CMU walls next to existing walls, grade beams with helical piers and the addition of interior and exterior steel brace frames.



Phase I (Howard and Cheever): completed summer 2013; Phase II (Haynes Hall): completed end of summer 2014.

5.2 PROJECT RANKING AND PRIORITIZATION

Each of the proposed projects has value; however, due to time and financial constraints it is not possible to implement all projects immediately. Project prioritization allows the most critical and cost-effective actions to be realized in the short term.

A cost-benefit matrix was developed to rank the mitigation projects using the following criteria. Each project was assigned a “high”, “medium”, or “low” rank for population protected, property protected, services impacted, project feasibility and cost:

- / **Population Protected:** A “high” rank means more than 50 percent of the campus population would be protected by implementation of the mitigation strategy; a “medium” rank means 20 to 50 percent of campus population would be protected; and, a “low” rank means less than 20 percent of the campus population would be protected.
- / **Property Protected:** A “high” rank means greater than \$500,000 worth of property would be protected through implementation of the mitigation strategy; “medium” means \$100,000 to \$500,000 worth of property would be protected; and, “low” means less than \$100,000 worth of property would be protected.
- / **Services Impacted:** A “high” rank represents that continuity of campus services would be maintained on greater than 50 percent of the campus by implementation of the mitigation strategy; a “medium” rank represents 20 to 50 percent of campus services would be maintained; and, a “low” rank represents less than 20 percent of the campus services would be maintained.
- / **Project Feasibility:** A “high” rank means technology is available and implementation is likely; a “medium” rank means technology may be available, but implementation could be difficult; and, a “low” rank means no technology is available or implementation would be unlikely.
- / **Project Cost:** A “high” rank means the mitigation project would cost more than \$500,000; a “medium” rank means the project cost would be between \$100,000 and \$500,000; and, “low” means the project would cost less than \$100,000.

The matrix was completed by assigning each rank a numeric value as presented in Table 5-1.

Table 5-1. Mitigation Project Cost-Benefit Matrix

	Population Protected	Property Protected	Services Impacted	Project Feasibility	Cost
High	5	5	5	5	1
Medium	3	3	3	3	3
Low	1	1	1	1	5

The overall cost-benefit was calculated by summing the total score for each project. Table 5-2 presents the 2018 MSU Annex mitigation strategy showing project cost-benefit scores. The stakeholder group determined project priority based on the need for the project. The prioritization of the projects serves as a guide for choosing and funding projects; however, depending on the funding sources, some actions may be best achieved outside the priorities established here.

Table 5-2. MSU-Bozeman Mitigation Strategy: Project Ranking and Responsible Departments

Goal	Objective	Project	Hazard(s) Mitigated	High-Medium-Low Score	Numeric Score	Campus Priority	Schedule/Status	Responsible Department
Goal 1: Reduce or Prevent Losses from Earthquake Hazard	Objective 1.1: Prevent and/or Reduce Structural Damage on Campus	1.1.1 Complete Tier 2 evaluation of campus buildings.	Earthquakes	Medium	21	Medium	Ongoing (evals. continuing, starting with worst case)	Campus Planning, Design & Construction (CPDC)
		1.1.2 Develop proposals and secure funding to complete retrofit projects for buildings that qualify for FEMA funding.	Earthquakes	Medium	21	Medium	Ongoing (Miller Dining Hall retrofit completed in 2013)	CPDC
		1.1.3 Implement risk reduction measures into future buildings and/or additions on campus.	Earthquakes	Medium	21	High	Ongoing (all new const. to meet seismic life-safety)	CPDC
		1.1.4 Develop GIS layer of building risk reduction attributes, including utility layers.	Earthquakes	Medium	17	High	Short-term (not started; possible joint project w/City)	CPDC, Emergency Management (EM)
		1.1.5 Implement building code upgrades on existing concerns identified in Long Range Building Plan, Strategic Plan, LRCDP, Capital Projects Database and FCI Reports as they relate to life safety issues.	Earthquakes	Medium	17	High	Ongoing (building code upgrades are being accounted for in the Long-Range Building Plan)	CPDC
		1.1.6 Plan for potential earthquake damage to utilities located in utility tunnels.	Earthquakes	Medium	21	High	Mid-term (not started)	Facilities Services
	Objective 1.2: Protect Students and Building Contents through Implementation of Non-Structural Mitigation Projects	1.2.1 Protect IT systems from seismic hazard by implementing nonstructural mitigation projects.	Earthquakes	High	25	Medium	Ongoing (Cloud-based strategies are being explored to improve disaster resilience and operations continuity)	University Information Technology (UIT)
	Objective 1.3: Prevent Fire and other Secondary Effects from Earthquakes	1.3.1 Install seismic shut-off valves on buildings with natural gas.	Earthquakes, Structure Fire	High	25	High	Ongoing (buildings w/o shutoff valves to be upgraded as funding is available)	Facilities Services
		1.3.4 Install Waterbugs in research buildings and other critical locations to detect water breaks and leaks.	Earthquakes, Severe Weather	Medium	19	High	Mid-term (not started)	Safety & Risk Management (SRM)
		1.3.5 Install Central Heating Plant back-up fuel storage replacement.	Earthquakes, Structure Fire, Hazardous Material Incidents, Terrorism	Medium	19	Medium	Long-term (not started)	Facilities Services

Goal	Objective	Project	Hazard(s) Mitigated	High-Medium-Low Score	Numeric Score	Campus Priority	Schedule/Status	Responsible Department
Goal 2: Reduce or Prevent Losses from Structural Fire Associated with Earthquake Hazard	Objective 2.1: Reduce Loss of Human Life and Building Contents from Structural Fire	2.1.1 Install sprinklers and alarm/ detection systems for all campus buildings that aren't currently equipped.	Structure Fire, Earthquakes	Medium	19	High	Ongoing (as funding is available, vulnerable buildings are outfitted)	Facilities Services
		2.1.3 Consider relocating critical services, such as computer facilities, from building basements.	Structure Fire, Earthquakes	Medium	21	Medium	Mid-term	Facilities Services, UIT
Goal 3: Protect Campus Records from Losses Associated with All Hazards	Objective 3.1: Implement Digital Archiving and Storage of Campus Records	3.1.1 Develop protocol for digital imaging of all university records.	All Hazards	Medium	15	Medium	Ongoing (Spring 2018 Document Management Program went digital)	Admin. & Finance
		3.1.4 Establish off-site backup server for Banner system.	All Hazards	Medium	21	High	Ongoing (Cloud-based backup is in place. Migration of entire ERP to Cloud is ongoing).	UIT
Goal 4: Protect Assets, Collections, and Building Contents from All Hazards	Objective 4.1: Safeguard Records, Documents, Specimens, Collections	4.1.1 Establish secure and climate-controlled storage of important documents and artwork.	All Hazards	Low	13	High	Long-term	Museum of the Rockies (MOR)
		4.1.2 Determine proper storage of museum holdings and academic assets.	All Hazards	Medium	17	High	Long-term	MOR, various Departments
Goal 5: Implement Mitigation Strategies to Enhance Campus Disaster Preparedness	Objective 5.1: Implement Projects to Maintain Continuity of Operations	5.1.1 Establish redundant system and physical protection for all utilities.	All Hazards	Medium	21	Medium	Ongoing (primary electrical protection underway; upgrades as funding is available)	Facilities Services
		5.1.4 Establish redundant communication systems as needed for existing buildings, new construction and remodel projects.	All Hazards	Medium	21	Medium	Ongoing (status unknown)	UIT
		5.1.5 Establish off-site computing and telecommunications resources for disaster recovery.	All Hazards	Medium	21	Medium	Mid-term (status unknown; should be addressed in upcoming Continuity of Operations Plan, 2019)	UIT
		5.1.6 Establish arrangements with other universities to share computing and telecommunications resources during disasters.	All Hazards	High	25	Medium	Mid-term (not started; some discussion has occurred with UM and MSU-Billings for DR-based ERP systems).	UIT
		5.1.10 Establish a policy for housing students displaced from campus during disaster.	All Hazards	Medium	19	High	Long-term (not started; this activity will be addressed through the Continuity of Ops. Plan)	EM, Auxiliary Services, American Red Cross
		5.1.12 Coordinate with other agencies for use of facilities to maintain continuity of campus operations.	All Hazards	Medium	21	High	Ongoing (to be explored further via the Continuity of Ops. Plan and with City)	Facilities Services, City of Bozeman

Goal	Objective	Project	Hazard(s) Mitigated	High-Medium-Low Score	Numeric Score	Campus Priority	Schedule/Status	Responsible Department
Goal 5: Implement Mitigation Strategies to Enhance Campus Disaster Preparedness	Objective 5.1: Implement Projects to Maintain Continuity of Operations	5.1.13 Develop a plan for satellite voice and data services and acquire the services and equipment.	All Hazards	Medium	21	High	Ongoing (modifications to the OBE required, continuing discussion)	UIT
		5.1.15 Get HAM radio station connected to the emergency power generation grid.	All Hazards	Medium	21	High	Long-term (unknown status; will likely not pursue further)	EM
		5.1.16 Develop an alternate water source for the campus.	All Hazards	Medium	19	Medium	On Going (Have discussed bringing an on campus well up to standard as a potential alternate water source. No physical measures have yet to be taken and the project is not prioritized. Could end up being a joint endeavor with the city through Continuity of Ops. Plan)	Facilities Services
		5.1.17 Protect IT systems from all hazards by utilizing cloud-based storage and develop cloud-based phone bank for use during disasters.	All Hazards	High	23	High	Short-term (some cloud-based systems are already in place; expand where funding is available)	UIT
		5.1.18 Identify critical university assets and develop a Continuity of Operations Plan (COOP).	All Hazards	High	25	High	Short-term (pursue a joint COOP with the community)	EM
		5.1.19 Replacement of various back-up generators; includes Central Heating Plant back-up generator.	All Hazards	Medium	19	Medium	Mid-term	Facilities Services
		5.1.20 Develop centralized primary electric generators.	All Hazards	Medium	19	Medium	Long-term (generators to be purchased and installed as funding is available)	Facilities Services
	Objective 5.2: Implement Projects to Enhance Evacuation and Emergency Sheltering	5.2.4 Procure and install back-up power generators for designated shelters on campus.	All Hazards	Medium	13	Medium	Ongoing (generators to be purchased and installed as funding is available)	Facilities Services
		5.2.5 Develop Campus Evacuation Procedure.	All Hazards	High	21	Medium	Mid-term (not started)	EM
		5.2.6 Procure vehicle for animal transport during evacuation.	All Hazards	Medium	17	Medium	Short-term	Animal Resource Center (ARC)
	Objective 5.3: Conduct Planning/Training Activities to Enhance Preparedness	5.3.1 Update the existing Emergency Response Manual	All Hazards	Medium	21	High	Ongoing (Emergency Ops. Plan is due for update and will include updated information via annexes)	EM
		5.3.2 Develop University-wide business continuity and post-disaster recovery plan, including providing IT and Telecommunications services.	All Hazards	Medium	21	Medium	Ongoing (Process started in Fall 2018; this project will be a joint effort with local communities)	EM, UIT, University Police (UP), and various other Departments

Goal	Objective	Project	Hazard(s) Mitigated	High-Medium-Low Score	Numeric Score	Campus Priority	Schedule/Status	Responsible Department
Goal 5: Implement Mitigation Strategies to Enhance Campus Disaster Preparedness	Objective 5.3: Conduct Planning/Training Activities to Enhance Preparedness	5.3.4 Appoint and train Campus Emergency Response Teams to respond to disasters on campus.	All Hazards	Medium	21	High	Ongoing (Campus EOC members are trained quarterly via table-top exercises. In Spring 2018, training provided by TEEX. Trainings will continue)	EM, various other Departments, City of Bozeman, Gallatin County
		5.3.6 Identify hazard risks at each MSU- Bozeman Agricultural Experiment station and determine whether covered by the county HMP.	All Hazards	Low	13	Medium	Long-term (status unknown)	Director of Montana Agricultural Experiment Stations
		5.3.7 Update and improve the existing Emergency Operations Plan (EOP).	All Hazards	Medium	21	High	Short-term (not started)	EM
Goal 7: Enhance Campus Awareness on Hazard Mitigation	Objective 7.1: Provide Public Outreach on All Hazards	7.1.1 Develop public awareness information campaign for incoming and current students focusing on natural hazards and what students can do to reduce their risk.	All Hazards	High	25	High	Ongoing (not started)	Auxiliary Services, Office of Student Success
		7.1.2 Develop webpage with a safety forum regarding disasters and what to do to reduce risk.	All Hazards	High	25	High	Short-term (the current EM webpage provides some of this information)	Auxiliary Services, EM
		7.1.4 Develop and exercise drills to evacuate buildings in case of fire, earthquakes or other disasters.	All Hazards	Medium	17	Medium	Ongoing (the MSU Fire Marshal holds fire drills in buildings throughout the year)	EM, SRM
		7.1.5 Develop awareness campaign for visitors/short term programs.	All Hazards	Low	13	High	Short-term (not started)	University Communications, Conference Services, Auxiliary Services, Residence Life
		7.1.7 Develop an Emergency Communications Plan for families of students, staff and faculty.	All Hazards	Medium	17	High	Ongoing (not started; should be prioritized)	University Comm., Conf. Services, Auxiliary Services, Residence Life, American Red Cross
Goal 8: Mitigate the Terrorism Hazard on Campus	Objective 8.1: Implement Techniques to Ensure Safety through Enhanced Security on Campus	8.1.2 Exercise Active Shooter training.	Terrorism-Violence	Medium	17	High	Ongoing (Active Shooter training is completed by UP Officers on at least an annual basis).	EM, UP
		8.1.3 Identify and procure cameras for campus.	Terrorism, Hazardous Material Incidents	High	25	High	Short-term (not started).	UP
Goal 9: Enhance Early Warning Systems on Campus	Objective 9.1: Implement Techniques to Alert Campus Population of Pending Hazard Events	9.1.1 Install early warning systems such as voice mail, sirens, "Giant Voice", monitors, website links, alternative websites, and voice-automated notification systems.	All Hazards	High	23	High	Ongoing (implementation & integration with Gallatin County for improved MSU Alert system)	EM, University Communications, UP

Goal	Objective	Project	Hazard(s) Mitigated	High-Medium-Low Score	Numeric Score	Campus Priority	Schedule/Status	Responsible Department
Goal 10: Reduce Vulnerability of Campus Buildings from Severe Weather	Objective 10.1: Minimize Impacts to Campus Operations from Trees and Landscaping	10.1.3 Install building system utility shutoff valves and drain lines to reduce potential damage from freeze up.	Severe Weather	Medium	17	Low	Ongoing (implement as funding is available and problems are identified)	Facilities Services
Notes: ARC = Animal Resource Center; COOP = Continuity of Operations Plan; CPDC = Campus Planning, Design & Construction; EM = Emergency Management; MOR = Museum of the Rockies; MUS = Montana University System; SRM = Safety & Risk Management; UIT = University Information Technology; UP = University Police								

5.3 PROJECT IMPLEMENTATION

The stakeholder committee reviewed the projects and assigned a corresponding department responsible for its implementation. Cooperating organizations for project implementation may include campus programs, utility companies, and city or county agencies that are capable of, or responsible for, implementing activities and programs. The stakeholder committee identified a schedule for implementation and potential funding sources. The schedule for implementation included several categories including:

- / **Ongoing:** Projects that are part of the university's emergency management program
- / **Short-term:** Projects to be completed within 1-2 years
- / **Mid-term:** Projects to be completed within 3-4 years
- / **Long-term:** Projects to be completed in 5 or more years

Table 5-3 presents project implementation details including: progress made since the 2013 MSU-PDM Plan was adopted, planned activities for the next five years, completed and deleted mitigation projects, and potential funding sources. MSU's Emergency Management Coordinator will be responsible for mitigation project administration.

Table 5-3. MSU-Bozeman Mitigation Strategy: Progress Made, Planned Activities, Status and Funding Sources [= project completed = project deleted = new project]

Hazard	Mitigation Action/Project	Status	Progress Made	Planned Activities	Funding
Earthquake	1.1.1 Complete Tier 2 evaluation of campus buildings.	Ongoing	Identified as a Long-Range Building Plan project for 2014-2015 Biennium. \$750,000 to complete Tier 2 evaluations of 30 major buildings.	Proceed with plan when funded.	FEMA Grant, State A&E
Earthquake	1.1.2 Develop proposals and secure funding to complete retrofit projects for buildings that qualify for FEMA funding.	Ongoing	\$2.2 million FEMA award for seismic retrofit of Creative Arts Complex	Submit additional grants.	MSU operating budget, FEMA grant
Earthquake	1.1.3 Implement risk reduction measures into future buildings and/or additions on campus.	Ongoing	Completed for new construction	Included in all new construction.	MSU operating budget
Earthquake	1.1.4 Develop GIS layer of building risk reduction attributes, including utility layers.	Not yet implemented	No progress to report	2014-2015 project with EM.	MSU operating budget
Earthquake	1.1.5 Implement building code upgrades on existing concerns identified in Long Range Building Plan, Strategic Plan, LRCDP, Capital Projects Database and FCI Reports as they relate to life safety issues.	Ongoing	Seismic improvements on three buildings (Creative Arts Complex) and others are underway	Seismic improvements to 3 dining halls and others are planned.	Montana University System appropriation, MSU operating budget
Earthquake	1.1.6 Plan for potential earthquake damage to utilities located in utility tunnels.	Partial progress	No progress to report.	Seismic evaluation of tunnels when funding received.	MSU operating budget
Earthquake	1.2.1 Protect IT systems from seismic hazard by implementing nonstructural mitigation projects.	Partial progress	Partial progress - AJM done, Renne partial.	Retrofit existing server racks with bracing.	MSU operating budget, FEMA grant
Earthquake	1.2.2 Develop a campus-wide strategy to implement non-structural mitigation practices.	Delete	No progress to report.	Nothing planned at this time.	MSU operating budget
Earthquake, Structure Fire	1.3.1 Install seismic shut-off valves on buildings with natural gas.	Ongoing; Partially complete	Shut-off valves have been installed on some buildings.	Continue with project in collaboration with utilities.	MSU operating budget, utility company (in-kind)
Earthquake, Structure Fire	1.3.2 Develop plans to prevent water damage to voice and data electronic equipment and cabling.	Delete	No progress to report	Get equipment out of basements as per Project 2.1.3.	MSU operating budget
Earthquake, Structure Fire	1.3.3 Install alternate fire suppression equipment in Telecommunications Rooms around campus.	Not yet implemented	No progress to report	No near-term activities planned.	Montana University System appropriation, MSU operating budget
Earthquake, Severe Weather	1.3.4 Install Waterbugs in research buildings and other critical locations to detect water breaks and leaks.	Not yet implemented	New project	Facilities with costly equipment and research activities to be prioritized.	MSU operating budget
Earthquakes, Structure Fire, Hazardous Material Incidents, Terrorism	1.3.5 Install Central Heating Plant back-up fuel storage replacement.	Not yet implemented	New project	Replace propane tank outside of Heating Plant to mitigate explosion potential from natural or human-made hazard.	MSU operating budget, FEMA grant

Hazard	Mitigation Action/Project	Status	Progress Made	Planned Activities	Funding
Structure Fire, Earthquake	2.1.1 Install sprinklers and alarm/ detection systems for all campus buildings that aren't currently equipped.	Ongoing	New construction and renovations projects (2 floors in Leon Johnson Hall and addition to Linfield Hall) received sprinklers.	Upgrades in all new construction.	Montana University System appropriation
Structure Fire, Earthquake	2.1.2 Consider alternate fire suppression for central library and computer facilities.	Complete	FM-200 in AJM	Halon replacement in Renne to be investigated.	Montana University System appropriation, MSU operating budget
Structure Fire, Earthquake	2.1.3 Consider relocating critical services, such as computer facilities, from building basements.	Partial progress	No progress to report	Investigate new or off-site data center locations. To be addressed through the Continuity of Operations process.	Montana University System appropriation, MSU operating budget
All Hazards	3.1.1 Develop protocol for digital imaging of all university records.	Ongoing; partial progress	Hired records clerk.	Develop implementation plan for converting to digital.	MSU operating budget
All Hazards	3.1.2 Establish off-site storage for tape backup of IT and Telecommunications systems.	Complete	Initial off-site backup storage of production ERP data complete.	Offsite storage to be part of any future backup initiatives.	MSU operating budget
All Hazards	3.1.3 Implement digital archiving by securing necessary equipment.	Complete	Electronic Document Management (EDMW) initiative beginning.	Investigate options in conjunction with EDMW initiative.	Montana University System appropriation, MSU operating budget
All Hazards	3.1.4 Establish off-site backup server for Banner system.	Not yet implemented	No progress to report	Investigate options (co-location facility or other MSU campus)	Montana University System appropriation
All Hazards	3.2.1 Establish policy for management of research documentation.	Complete	No progress to report	Newly forming Center for Research computing and Library staff to investigate.	MSU operating budget
All Hazards	4.1.1 Establish secure and climate-controlled storage of important documents and artwork.	Partial progress	No progress to report.	Museum of the Rockies is fundraising for this purpose.	Montana University System appropriation, MSU operating budget
All Hazards	4.1.2 Determine proper storage of Museum holdings and academic assets.	Partially complete	Museum of the Rockies has completed this. Partially progress with Academic assets.	Departments working on this.	MSU operating budget
All Hazards	5.1.1 Establish redundant system and physical protection for all utilities.	Ongoing; partial progress	Primary electrical protection underway.	Backup heating fuel project being assessed. Centralized emergency generator being assessed. Construct new utilities feed from Northwestern Energy in secondary location to provide system redundancy.	Montana University System appropriation, MSU operating budget
All Hazards	5.1.2 Inventory and prioritize water and sewer lines that need to be upgraded.	Complete	Master plan developed that prioritized water and sewer upgrades.	Implementation of the plan.	MSU operating budget, City of Bozeman (in-kind)
All Hazards	5.1.4 Establish redundant communication systems as needed for existing buildings, new construction and remodel projects.	Partial progress	Redundant fiber plant and backup ISP in progress (6/13). Redundant data network core underway.	Redundant paths and equipment being implemented.	Montana University System appropriation, MSU operating budget

Hazard	Mitigation Action/Project	Status	Progress Made	Planned Activities	Funding
All Hazards	5.1.5 Establish off-site computing and telecommunications resources for disaster recovery.	Not yet implemented	No progress to report	Investigate options (co-location facility or other MSU campus)	Montana University System appropriation, MSU operating budget
All Hazards	5.1.6 Establish arrangements with other universities to share computing and telecommunications resources during disasters.	Not yet implemented	No progress to report	Initial discussions with MSU campuses and U of M underway.	MSU operating budget
All Hazards	5.1.7 Prioritize buildings for emergency generators and install pigtail connections for mobile generator.	Complete	All essential buildings have back-up generators or connections.	N/A	MSU operating budget
All Hazards	5.1.8 Obtain at least three mobile generators for campus critical facilities.	Delete	No progress to report	Implement as funding secured.	Montana University System appropriation, MSU operating budget
All Hazards	5.1.10 Establish a policy for housing students displaced from campus during disaster.	Partial progress	No progress to report	EM will coordinate with partners to establish policy.	MSU operating budget, Red Cross (in-kind)
All Hazards	5.1.11 Evaluate campus buildings for suitability as emergency shelters.	Complete	SUB identified as a potential shelter. Fieldhouse identifies as a potential Point of Dispensing (POD).	Activities will be planned in accordance with Emergency Response Plan.	MSU operating budget, Red Cross (in-kind)
All Hazards	5.1.12 Coordinate with other agencies for use of facilities to maintain continuity of campus operations.	Not yet implemented	Will be addressed in Emergency Response Plan which is currently underway.	Activities will be planned in accordance with Emergency Response Plan.	MSU operating budget, City of Bozeman/Gallatin County (in-kind)
All Hazards	5.1.13 Develop a plan for satellite voice and data services and acquire the services and equipment.	Not yet implemented	No progress to report	No near-term activities planned. Will re-evaluate viability/need for this.	Montana University System appropriation, MSU operating budget
All Hazards	5.1.14 Create a GIS layer of campus utilities and tie into City system	Delete	No progress to report	Redundant with Project 1.1.4	MSU operating budget, City of Bozeman (in-kind)
All Hazards	5.1.15 Get HAM radio station connected to the emergency power generation grid.	Not yet implemented	No progress to report	Assess whether HAM station is on back-up. If not, determine how connections will be made.	MSU operating budget
All Hazards	5.1.16 Develop an alternate water source for the campus.	Not yet implemented	No progress to report	Developing plan with City of Bozeman. Consultant to evaluate University as district for impact fees.	MSU operating budget, City of Bozeman
All Hazards	5.1.17 Protect IT systems from all hazards by utilizing cloud-based storage; develop cloud-based phone bank for use during disasters.	Partial progress	New project. Some cloud-based systems are already in place; expand where funding is available.	Investigate use of a virtual phone bank that could be utilized anywhere during a disaster. Will reduce overloading of phone lines.	MSU operating budget.
All Hazards	5.1.18 Identify critical university assets and develop a Continuity of Operations Plan (COOP).	Not yet implemented	New project.	MSU will pursue a joint COOP with the community (City of Bozeman/Gallatin Co.)	MSU operating budget, City of Bozeman, Gallatin Co.

Hazard	Mitigation Action/Project	Status	Progress Made	Planned Activities	Funding
All Hazards	5.1.19 Replacement of various back-up generators; includes Central Heating Plant back-up generator.	Not yet implemented	New project.	Various back-up generators are in need of replacement due to age and potential failure issues.	MSU operating budget, FEMA grant
All Hazards	5.1.20 Develop centralized primary electric generators.	Not yet implemented	New project.	Construct bank of electrical generators at a centralized location that is disaster resilient (DR).	MSU operating budget, FEMA grant
All Hazards	5.2.3 Install signage marking evacuation routes from campus buildings.	Complete	Signage is provided in buildings depicting fire escape routes.	Continue to include with renovations and new projects.	MSU operating budget
All Hazards	5.2.4 Procure and install back-up power generators for designated shelters on campus.	Not yet implemented	No progress to report	Implement when funded.	Montana University System appropriation, MSU operating budget
All Hazards	5.2.5 Develop Campus Evacuation Procedure.	Not yet implemented	New project.	Explore how to safely evacuate individuals from campus when deemed necessary. Identify evacuation routes, transportation needs, sheltering needs.	MSU operating budget
All Hazards	5.2.6 Procure vehicle for animal transport during evacuation.	Not yet implemented	New project.	Procure vehicle to move non-human primates in the event of a campus evacuation and/or an evacuation of the Animal Resource Center (ARC)	MSU operating budget
All Hazards	5.3.1 Update the existing Emergency Response Manual	Partial progress	An EM position was approved 3/2013. Contractor selected. Contractor and committee updating plan.	EM position to be filled 12/2013. Contractor to complete plan by spring 2014	MSU operating budget
All Hazards	5.3.2 Develop University-wide business continuity and post-disaster recovery plan, including providing IT and Telecommunications services.	Partial progress	Incomplete partial plan - in need of refinement.	Recently formed EMTF includes Business Continuity Committee ramping up summer 2013.	Montana University System appropriation, MSU operating budget
All Hazards	5.3.3 Develop University-wide post-disaster recovery plan.	Delete	This project has been combined with Project 5.3.2	None	Montana University System (MUS) appropriation, MSU operating budget
All Hazards	5.3.4 Appoint and train Campus Emergency Response Teams to respond to disasters on campus.	Partial progress	An Emergency response Coordinator position was approved 3/2013. Emergency response planning committee underway	EM position to be filled 12/2013. EM position will determine implementation.	MSU operating budget, Gallatin County (in-kind)
All Hazards	5.3.5 Conduct training exercises on a regular basis.	Delete	N/A	Redundant with project 7.1.4	N/A
All Hazards	5.3.6 Identify hazard risks at each MSU-Bozeman Agricultural Experiment station and determine whether covered by county HMP.	Not yet implemented	No progress to report	No planned activities.	Montana University System appropriation, MSU operating budget
All Hazards	5.3.7 Develop Utilities Continuity Plan.	Delete	N/A	This project is redundant with Project 5.3.2.	MSU operating budget

Hazard	Mitigation Action/Project	Status	Progress Made	Planned Activities	Funding
All Hazards	5.3.8 Update and improve the existing Emergency Operations Plan (EOP).	Not yet implemented	New project.	EOP needs to be updated with annex-specific instructions to address all hazards.	MUS appropriation, MSU operating budget
Hazardous Material Incidents	6.1.1 Maintain detailed inventory/database and centralized data management of hazardous chemicals on campus and create GIS layer.	Complete	The data inventory system is implemented and went live in Fall 2018.	N/A	MSU operating budget
Hazardous Material Incidents	6.1.2 Establish protection/security of fuel storage facility.	Complete	Fuel storage facility has been fenced.	N/A	MSU operating budget
Hazardous Material Incidents	6.1.3 Identify specific non-structural mitigation projects for hazardous materials.	Complete	Centralized all large quantity academic use chemicals into approved chemical storage facility. Facilities maintenance operations centralized chemicals in new storage facility in isolated location.	N/A	MSU operating budget
All Hazards	7.1.1 Develop public awareness information campaign for incoming and current students focusing on natural hazards and what students can do to reduce their own risk.	Ongoing	No progress to report for Student Success.	Student Success has no activities planned for implementation.	MSU operating budget
All Hazards	7.1.2 Develop webpage with a safety forum regarding disasters and what to do to reduce risk.	Not yet implemented	No progress to report	Done in consultation with new Emergency Management coordinator.	MSU operating budget
All Hazards	7.1.4 Develop and exercise drills to evacuate buildings in case of fire, earthquakes or other disasters.	Ongoing	Ongoing fire and evacuation drills.	Participate in Rocky Mountain Shake-out.	MSU operating budget, Gallatin County (in-kind)
All Hazards	7.1.5 Develop awareness campaign for visitors/short term programs.	Not yet implemented	No progress to report	Review what this would entail.	MSU operating budget
All Hazards	7.1.6 Maintain Emergency Disaster and Recovery Instructions in the MSU-Bozeman Telephone Directory.	Delete	MSU no longer produces a telephone directory.	Development of Emergency Disaster and Recovery Instruction.	MSU operating budget
All Hazards	7.1.7 Develop an Emergency Communication Plan for families of students, staff and faculty.	Not yet implemented	Progress has been made in outlining what to communicate and how.	Hiring of Emergency Management coordinator and discussions of emergency framework.	MSU operating budget
Terrorism-Violence	8.1.1 Install enhanced building security (card access, cameras, blue light emergency telephone).	Complete	Targeted areas completed (blue light system installed throughout campus, card access for all residence halls).	N/A	Montana University System appropriation, MSU operating budget
Terrorism-Violence	8.1.2 Exercise Active Shooter training.	Ongoing	University Police conducted an Active Shooter training event in August 2018.	Coordinate training with EM and Campus Police.	MSU operating budget
Terrorism, Hazardous Material Incidents	8.1.3 Identify and procure cameras for campus.	Not yet implemented	New project	Would allow additional surveillance of campus during disasters and/or acts of terrorism.	MSU operating budget, FEMA grant

Hazard	Mitigation Action/Project	Status	Progress Made	Planned Activities	Funding
All Hazards	9.1.1 Install early warning systems such voice mail, sirens, website links, alternative websites, and voice automated notification systems.	Ongoing; partial progress	Partial Progress; MSU Alert Cell phone Text Messaging, email, website, social media in place as of June 2013.	Continued refinement of current electronic communications and training.	Montana University System appropriation, MSU operating budget
Severe Summer & Winter Weather	10.1.1 Conduct landscape inventory to evaluate potential vulnerabilities.	Complete; update as needed	Landscape inventory complete via GIS.	Continue to update as needed as campus changes.	MSU operating budget
Severe Summer & Winter Weather	10.1.2 Develop standards for tree/landscape maintenance.	Complete	Tree/landscape maintenance standards have been developed.	N/A	MSU operating budget
Severe Weather	10.1.3 Install building system utility shutoff valves and drain lines to reduce potential damage from freeze up.	Partially Complete	Some buildings completed in accordance with implementation plan.	Continue to implement the plan.	MSU operating budget

5.4 POTENTIAL FUNDING SOURCES

Funding for mitigation projects listed in this plan may be available from federal and state programs, appropriations from the university system, in-kind services from local government and non-profit organizations, and/or businesses which hire MSU-Bozeman graduates, alumni organizations and utility companies. Some programs may require MSU to apply through Montana DES, Montana A&E or City of Bozeman/Gallatin County for funding. Potential funding sources are summarized below.

FEMA, Hazard Mitigation Grant Program (HMGP). The HMGP provides grants to States, Indian Tribes, local governments, and private non-profit organizations to implement long-term hazard mitigation measures after a major disaster declaration. The purpose of the HMGP is to reduce the loss of life and property due to natural disasters and to enable mitigation measures to be implemented during the immediate recovery from a disaster. The HMGP is authorized under Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act. HMGP provides 75/25 cost-share funding.

FEMA, Pre-Disaster Mitigation Competitive (PDMC) Grant Program. The PDM program provides funds to states, territories, and local governments, communities, and universities for hazard mitigation planning and the implementation of mitigation projects prior to a disaster event. Funding these plans and projects reduces overall risks to the population and structures, while also reducing reliance on funding from actual disaster declarations. PDMC grants are awarded on a competitive basis and without reference to state allocations, quotas, or other formula-based allocation of funds. PDMC provides 75/25 cost-share funding.

U.S. Department of Homeland Security. Enhances the ability of states, and local jurisdictions, and other regional authorities in the preparation, prevention, and response to terrorist attacks and other disasters, by distributing grant funds. Localities can use grants for planning, equipment, training and exercise needs. These grants include but are not limited to areas of Critical Infrastructure Protection Equipment and Training for First Responders, and Homeland Security Grants.

Hazardous Materials Emergency Preparedness Grants. Grant funds will be passed through to local emergency management offices and HazMat teams having functional and active LEPC groups.

5.5 LEGAL FRAMEWORK

Several federal, state and local regulations, policies and plans form the legal framework available to implement the MSU-Bozeman hazard mitigation goals and projects.

Federal

- / Federal Civil Defense Act of 1950
- / Public Law 96-342, The Improved Civil Defense Act of 1980
- / Public Law 91-606, Disaster Relief Act
- / Public Law 93-288, The Robert T. Stafford Disaster Relief Act of 1974
- / Presidential Executive Order 11988, Floodplain Management
- / Presidential Executive Order 11990, Protection of Wetlands

State of Montana

- / Montana Code Annotated, Title 10, Chapter 3, Disaster and Emergency Services
- / Montana Code Annotated, Title 76, Chapter 5, Flood Plain and Floodway Management
- / Montana Code Annotated, Title 50, Chapter 60, Building Construction Standards
- / Montana Code Annotated, Title 76, Chapter 2, Planning and Zoning

Gallatin County

- / Gallatin County Hazard Mitigation Plan
- / Gallatin County Municipal Code

City of Bozeman

- / City of Bozeman Municipal Code

MSU-Bozeman

- / Strategic Plan
- / Long Range Building Plan
- / Capital Equipment Plan
- / Emergency Response Plan
- / MSU-Bozeman Safety Policy
- / Pandemic Plan
- / Hazard Communication Program –OSHA
- / Job Descriptions for Safety Committee members

5.6 CAPABILITY ASSESSMENT

MSU-Bozeman’s capabilities to implement mitigation projects include planners, engineers, scientists, emergency managers, GIS personnel, and financial and administrative professionals. Available resources and expertise within the City of Bozeman, Gallatin County and the State of Montana enhance MSU’s capabilities for resiliency. These resources collectively have the responsibility to maintain MSU-Bozeman as a disaster-resistant university. The goals and objectives used to mitigate natural and technological hazards builds on the campus’ existing capabilities.

5.6.1 MSU-BOZEMAN

MSU’s Emergency Manager will provide overall coordination of hazard mitigation on campus. In-house capabilities to implement mitigation projects are generally within the offices of Safety and Risk Management and Facilities Services, as described below.

5.6.2 UNIVERSITY SERVICES

University Services maintains MSU's academic, research, housing and auxiliary facilities, which house classrooms, auditoriums, laboratories, student residences, athletic events venues, food service operations, etc. University Services consists of the following service management areas:

- / **Environmental Services:** Landscape, Grounds & Irrigation, Custodial, Solid Waste Disposal, Recycling
- / **Engineering & Utilities:** Utility Infrastructure, Heat Plant Operations Energy Management, Engineering Services
- / **Business Management:** Budget & Accounting, Information Systems, Real Estate
- / **General Operations:** Work Control, Preventive Maintenance, Stores/Purchasing, Facilities Safety, Mail Services
- / **Campus Maintenance:** Maintenance Trades

University Services functions that pertain to emergency response and pre-disaster mitigation include:

- / Landscape and grounds maintenance
- / Repair, maintenance and renovation of campus facilities
- / Repair, maintenance and upgrades of campus utilities
- / Central heating plant operations
- / Preventive maintenance
- / Excavation and waste management

5.6.3 CAMPUS PLANNING, DESIGN AND CONSTRUCTION

Campus Planning, Design & Construction (CPDC) manages the planning, design and construction efforts for new structures, renovations, major maintenance projects and infrastructure projects. CPDC includes architectural services, campus master planning, space management, capital construction planning, and historic preservation. CPDC functions that pertain to emergency response and pre-disaster mitigation include:

- / Managing structural analysis and design
- / Campus ADA planning
- / Building plans records and archives
- / Liaison with the external design community, contractors and other state agencies

5.6.4 EMERGENCY MANAGEMENT

The Office of Emergency Management, within the University Police Department, is charged with the following:

- / Coordinate and implement plans for emergency preparedness, disaster mitigation, emergency response, recovery, and continuity of operations efforts for the MSU-Bozeman campus.
- / Plan, coordinate and conduct emergency management exercises on an annual basis, including at least one live exercise and one tabletop exercise each year.

- / Conduct training in emergency management, planning and preparedness for key University administrators and departmental directors at the University and across all campuses in the MSU system.
- / Assist university departments with identifying key indicators that influence potential business impacts and help identify processes and procedures to improve response plans and business resilience.
- / Research opportunities and apply for federal funding for emergency management related needs and administer and report on the progress of such grants.

5.6.5 MONTANA DEPARTMENT OF ADMINISTRATION, ARCHITECTURE AND ENGINEERING DIVISION

The Montana Department of Administration, Architecture and Engineering Division (A&E) serves and assists the Montana University System in the design and construction of facilities, repairs and alterations of existing facilities, and planning for their needs. The State of Montana has adopted High Performance Design Standards for the construction, renovation, and maintenance of public buildings in the state. These standards have been developed to improve the capacity of the state to design, build, and operate high-performance and resilient buildings. The resiliency factor includes design to mitigate the effect of natural hazards and man-made disasters. The A&E Division functions in partnership with the universities to procure and execute design and construction projects related to state owned facilities.

5.6.6 GALLATIN COUNTY EMERGENCY MANAGEMENT, ALL HAZARDS ALL DISCIPLINE (AHAD) GROUP

The mission of the Gallatin County All Hazards All Discipline (AHAD) group is to provide resources and guidance to the community through education, coordination and assistance in disaster response planning, as well as to assure public health and safety. They do not function in actual emergency situations, but attempt to identify and catalogue potential hazards, identify available resources, and mitigate hazards when feasible. The AHAD consists of representatives from businesses, local government, emergency responders and citizen groups located in the City of Bozeman and Gallatin County. Bi-monthly meetings are held.

MSU-Bozeman is an active participant in the County AHAD group. The Emergency Management Coordinator and Police Dept. Captain regularly attend AHAD meetings and are active members.

5.6.7 GALLATIN COUNTY PUBLIC HEALTH

MSU-Bozeman participates in and hosts various planning sessions and tabletop exercises with Gallatin County Public Health office. The result of the cooperation was the formation of a county Unified Health Command with MSU Health Services as one leg of a triangular organization including the Public Health Office and the Department of Public Health and Human Services.

6.0 PLAN MAINTENANCE PROCEDURES

The Plan maintenance section of this document details the formal process that will ensure that the MSU-Bozeman Annex remains an active and relevant document. The maintenance process includes a schedule for monitoring and evaluating the Annex and producing a revision every five years. This section describes how MSU-Bozeman will integrate public participation throughout the maintenance process. Also included in this section is an explanation of how MSU-Bozeman intends to incorporate the mitigation strategies outlined in this Annex into existing planning mechanisms and policies.

6.1 MONITORING, EVALUATING, AND UPDATING THE PLAN

6.1.1 PROCESS USED PREVIOUSLY

The MSU-Bozeman PDM Plan was to be reviewed every two years, or as deemed necessary by knowledge of new hazards, vulnerabilities, or other pertinent reasons. The purpose of the review was to determine whether a Plan update was needed prior to the scheduled five-year update, identify new mitigation projects, and/or evaluate the effectiveness of existing policies relating to mitigation.

No new hazards or vulnerabilities came up since the MSU-Bozeman PDM Plan was adopted in 2007, no new mitigation projects were deemed necessary, and current policies did not need revision. As such, the MSU-Bozeman PDM Plan was not reviewed or evaluated during the interim, with one exception. The PDM Plan was reviewed in response to a grant application submitted to FEMA in 2010 for a seismic retrofit of the Creative Arts Complex. The Plan review was necessary at that time to ensure the grant application was aligned with a mitigation action described in the Plan.

When Hazard Mitigation Grant Program (HMGP) planning funds became available in 2011 due to a Presidential flood disaster (DR-1996), MSU-Bozeman decided to request funding to update their Plan. A HMGP planning grant application was prepared, submitted and subsequently awarded for the plan update their PDM Plan. A contractor was hired to facilitate with the planning process over an 18-month period.

The update process involved a kick-off meeting, planning forums, and a public meeting where the Advisory Committee and community stakeholders exchanged ideas on hazard vulnerability and mitigation actions. The draft plan was available for public review on the project website and comments received were integrated into a revised draft document. The revised draft was posted on the project website for final comment and submitted to the Montana State Hazard Mitigation Officer and FEMA for acceptance. Additional comments were addressed in a final version of the Plan that was adopted by the President of Montana State University.

6.1.2 FUTURE PLANNING PROCESS

The MSU-Bozeman PDM Advisory Committee will continue to meet on an as-needed basis to monitor and evaluate the Annex and to determine whether an update is needed sooner than five years. The Committee will discuss progress made towards implementing the high priority mitigation actions and determine whether grants should be prepared to secure mitigation project funding.

The MSU Emergency Management Coordinator will be responsible for the next five-year Annex update. One year prior to the expiration of the current plan, a grant application will be prepared to secure funding through FEMA's HMGP or PDM grant programs. If FEMA funding is unavailable, MSU-Bozeman will update the Annex in-house using university resources. Annex development, review, and adoption will be similar to the process used for the 2018 PDM Plan update.

6.2 IMPLEMENTATION THROUGH EXISTING PROGRAMS

MSU-Bozeman will have the opportunity to implement hazard mitigation projects through existing programs and policies. Campus stakeholders will work with the MSU-Bozeman PDM Advisory Committee to ensure hazard mitigation projects are consistent with planning goals and integrate them, where appropriate.

The university currently uses a Strategic Plan and Long-Range Building Plan to guide and control campus development and maintenance of existing facilities. The university will require that hazards be addressed in these plans; specifically, that life and property be protected from natural disasters and man-caused hazards. The PDM Advisory Committee will conduct periodic reviews of campus plans and policies to ensure that hazard mitigation is being incorporated where appropriate. Campus capital improvements will also contribute to the goals in the Annex. The PDM Advisory Committee will work with capital improvement planners to ensure that high-hazard areas are being considered for low risk uses.

Meetings of the MSU-Bozeman PDM Advisory Committee will provide an opportunity to report back on the progress made on the integration of mitigation planning elements into campus planning documents and procedures.

6.3 CONTINUED PUBLIC INVOLVEMENT

MSU-Bozeman is dedicated to involving the campus population and community stakeholders in review and update of the HMP Annex. The campus population and stakeholders will have many opportunities to provide feedback. The Annex will be available on the campus website and a hard copy will available at the library. The MSU Emergency Management Coordinator will be responsible for keeping track of comments on the Annex and implementing comments where possible. Future comments on the MSU-Bozeman HMP Annex should be addressed to:

Emergency Management Coordinator
Montana State University
P.O. Box 170510
Bozeman, MT 59717-0510

A public meeting will be held at the start of the five-year update to provide the campus population and community stakeholders a forum through which they can express ideas and opinions about the Annex. The MSU Emergency Management Coordinator will be responsible for using campus resources to publicize the public meeting and maintain public involvement via the campus newspaper and website.



APPENDIX A

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APPENDIX B

LIST OF PROJECT STAKEHOLDERS

Stakeholder participation Invitation letters

Public meeting announcements (community letters & e-mail invitations)

Legal notice confirmation

Plan comment and feedback solicitation (VIA e-mail & GCEM webpage)



List of Project Stakeholders for the 2018 Gallatin County HMP Update

Name	Organization	Participation
Charles Locke	American Medical Response, Administration Supervisor	Meetings
Andy Egstad	American Medical Response, Project Manager	
Susan Spanjol	American Red Cross of Montana, Co-Chair	Meetings
Linda Skelton	Amsterdam School, District Clerk	
Dan Sheil	Big Sky Fire Department	Meeting
Stephen Pruiett	Big Sky Fire Department, Captain	Meeting
Seth Barker	Big Sky Fire Department, Captain	Meetings
William Farhat	Big Sky Fire Department, Fire Chief	Meeting
Kristin Drain	Big Sky Resort Tax District	Meeting
Michael Scholz	Big Sky Resort Tax District	Meeting
Mike Unruh	Big Sky Resort, Mountain Operations Manager	Meeting
Greg Megaard	Bozeman Fire, Deputy Fire Chief	Meetings
Mike Maltaverne	Bozeman Fire, Deputy Fire Chief	Meetings
Rich McLane	Bozeman Police, Deputy Police Chief (retired)	
Jim Veltkamp	Bozeman Police, Patrol Captain	Meeting
Steve Crawford	Bozeman Police, Police Chief	Meeting
Cory Klumb	Bozeman Police, Police Detective Captain	Meeting
Mike Koehnke	Broadwater County Disaster and Emergency Services, Coordinator	Meeting
Ed Shindoll	Broadwater County Rural Fire Department, Fire Chief	Meeting
Wynn Meehan	Broadwater County Sheriff's Office, Sheriff	Meeting
Brandon Harris	Broadwater County Sheriff's Office, Undersheriff	Meeting
Ron Lindroth	Central Valley Fire District, Chief	Meetings
Jane Arntzen Schumacher	Child Care Connections	Meeting
Jason Karp	City of Belgrade, Planning	Meeting
Cyndy Andrus	City of Bozeman, Mayor	
Craig Woolard	City of Bozeman, Public Works	Meeting
Natalie Meyer	City of Bozeman, Sustainability Manager	Meeting
Eric Campbell	City of Bozeman, Water Treatment Plan Superintendent	Meeting
Crystal Turner	City of Three Forks, City Clerk	
Denny Nelson	City of Three Forks, City Council	Meeting
Kelly Smith	City of Three Forks, City Treasurer	

Name	Organization	Participation
Steven Hamilton	City of Three Forks, Mayor	Meeting
Scott Newell	City of West Yellowstone, Police Chief	Meeting
Buck Taylor	Community Health Partners, Director of Community Development and Administration	Meeting
Fred Jones	Custer Gallatin National Forest, District Fire Management Officer	Meeting
Jessianne Wright	Explore Big Sky, Reporter	Meetings
Bryan Connelley	Fire Out Consulting, Owner	Meeting
Betty Kalakay	Gallatin City-County Health Department, Emergency Response Coordinator	Meetings
Matt Kelley	Gallatin City-County Health Department, Health Officer	
Mary Hendrix	Gallatin Conservation District, District Administrator	Meeting
Steve White	Gallatin County Commission, Chairman	
Sarah Gracey	Gallatin County Commission, Clerk	
Don Seifert	Gallatin County Commission, Commissioner	
Joe Skinner	Gallatin County Commission, Commissioner	
Patrick Lonergan	Gallatin County Emergency Management, Director	Meetings, Data, Document Review
Don Wilson	Gallatin County Search and Rescue, HAM Radio Operator	Meeting
Kelly Brandon	Gallatin County Sheriff's Office	
Mike Gavagan	Gallatin County Sheriff's Office, Deputy Sheriff	Meeting
Don Peterson	Gallatin County Sheriff's Office, Detective	
Jake Wagner	Gallatin County Sheriff's Office, Patrol	
Brandon Kelly	Gallatin County Sheriff's Office, Sergeant	Meeting
Jim Anderson	Gallatin County Sheriff's Office, Sergeant	
Dan McDonough	Gallatin County Sheriff's Office, Sheriff's Deputy	Meeting
Dan Springer	Gallatin County Sherriff's Office, Undersheriff	Meeting
Bill Brownell	Gallatin County, Bridge and Road Superintendent	
Jim Doar	Gallatin County, County Administrator	Meeting
Jeremy Kopp	Gallatin County, Detective Sergeant	Meeting
Frank Dougher	Gallatin County, GIS Supervisor	Data
Jenny Connelley	Gallatin County, GIS Technician	Data
Chris Scott	Gallatin County, Planner	Meeting
Sean O'Callaghan	Gallatin County, Planning Director and Floodplain Administer	Meetings

Name	Organization	Participation
Jeremiah Hillier	Gallatin Gateway Rural Fire, Captain	
Tammy Swinney	Gallatin Local Water Quality District, District Manager	
Doug Chabot	Gallatin National Forest Avalanche Center, Director	
Megan Syner	Great Falls National Weather Service, Meteorologist	Meeting
Arin Peters	Great Falls National Weather Service, Senior Service Hydrologist	Meeting
Shane Grube	Hebgen Basin Rural Fire District, Chief	Meetings
Jason Brey	Hebgen Lake Ranger District, District Ranger	Meetings
Mary Martin	HOPE Animal-Assisted Crisis Response	Meeting
Dave Hamilton	Lewis and Clark County Fire, Assistant Fire Chief	
Audrey Ulmen	Manhattan Fire, Secretary and Captain/Medical Officer	Meeting
Stephene Kamerman	Mental Health Local Advisory Council, Assistant	
Kerri Strasheim	Montana Department of Natural Resources and Conservation, Regional Manager	Meeting
Craig Campbell	Montana Department of Natural Resources and Conservation, Unit Manager	Meetings
Paul McCauley	Montana Department of Transportation	Meeting
Kyle DeMars	Montana Department of Transportation, Maintenance Chief	
Bob Fry	Montana Disaster and Emergency Services, Field Officer	Meetings
James Jessop	Montana Disaster and Emergency Services, Field Officer	Meetings
Nadene Wadsworth	Montana Disaster and Emergency Services, State Hazard Mitigation Officer	Meeting, Document Review
Sam Sheppard	Montana Fish, Wildlife and Parks, Supervisor (retired)	
Mark Wilfore	Montana Highway Patrol, Captain	
Glen Barcus	Montana Highway Patrol, Sergeant	
Pat McCarthy	Montana Highway Patrol, Sergeant	
Pat McLaughlin	Montana Highway Patrol, Sergeant	
Steven Doner	Montana State University Police, Captain	Meeting
Ryan Brickman	Montana State University, Chemical Safety Officer	Meeting
Hayley Tuggle	Montana State University, Emergency Management Coordinator	Meetings, Data
Dominique Woodham	Montana State University, MSU Extension Natural Resource Agent	Meeting

Name	Organization	Participation
Randy Stephens	Montana State University, University Architect	Meeting
Madison Boone	Montana State University, Program Director Institute on Ecosystems	Meeting
Christopher Mahony	Natural Resource Conservation Service, District Conservationist	Meetings
Justin Meissner	Natural Resource Conservation Service, District Conservationist	Meeting
Tyler Martindale	Natural Resources Conservation Service, Area Engineer	Meeting
Kyle Ecker	Northwestern Energy, Supervisor of Operations Planning	
Keith Bast	Phillips 66 Yellowstone Pipeline	Meeting
Jeff Myers	REACH Air Medical Services, Flight Nurse and Medical Crew Lead	Meeting
Linda Racicot	Red Cross	Meeting
Jessica Haas	Rocky Mountain Research Station, Fire Ecologist	Meetings, Data
Dustin Tetrault	Ruby Valley Hospital, Paramedic	Meeting
Scott Sanders	Stockman Bank, Senior Vice President	
Christina Powell	The Help Center, Co-Director	Meeting
Becky Arbuckle	Three Forks Area Ambulance, Crew Supervisor	
Justin Mitchell	Three Forks resident	
Jessica Puckett	Three Rivers Medical Clinic, Doctor	Meeting
Dennis Hengel	Town of Manhattan, Chief of Police	Meeting
Steve Gonzales	Town of Manhattan, City Council	Meeting
Pam Humphrey	Town of Manhattan, Clerk/Treasurer	Meeting
Jeff McAllister	Town of Manhattan, Public Works	Meeting
Steven Kurk	Town of Manhattan, Public Works	Meeting
Dan Sabolsky	Town of West Yellowstone, Town Manager	Meetings
Marianne Baumberger	US Forest Service, Bozeman and Hebgen Lake Ranger Districts	Meeting
Corey Lewellen	US Forest Service, District Ranger	Meetings
Don Helmbrecht	US Forest Service, Fire Analyst	Meeting
Todd Erdody	US Forest Service, Fire Ecologist	Meetings, Data
Marysue Costello	West Yellowstone Chamber of Commerce, Executive Director	Meeting
Keith Aune	Three Forks Fire, Chief	Meetings
Pete Stock	Willow Creek Rural Fire Department, Captain of Three Forks Area Ambulance	

Name	Organization	Participation
George Reich	Willow Creek Rural Fire Department, Fire Chief	Meetings
Jason Manley	Yellowstone Club, Fire	Meeting
Todd Opperman	Yellowstone National Park, Deputy FMO	Meetings
John Cataldo	Yellowstone National Park, Fire and Aviation Management Officer	

This note is published. [Edit Note](#)

Search

Contribute to Your Emergency Plans

GALLATIN COUNTY EMERGENCY MANAGEMENT · TUESDAY, SEPTEMBER 26, 2017

Gallatin County Emergency Management is holding our first round of public meetings on the revision of our Hazard Mitigation and Community Wildfire Protection Plans over the coming month. These plans are important to our community's preparedness through their identification of the hazards present and proposing options on how these risks can be mitigated.

This is where you come in. We welcome everyone's participation in this process!

	Disaster			Impact		
Wildfire	High	High	High	Moderate	Moderate	High
Earthquake	High	High	High	High	Moderate	High
Hazardous Materials Release	High	Moderate	High	High	Moderate	High
Flooding	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
Communicable Disease and Bioterrorism	Moderate	Low	High	High	Low	Moderate
Drought	Moderate	Moderate	Low	High	Moderate	Moderate
Winter Storms and Extended Cold	Moderate	Low	Moderate	Moderate	Low	Moderate
Utility Outage	Moderate	Low	High	Moderate	Low	Moderate
Severe Thunderstorms Wind and Tornadoes	Moderate	Moderate	Moderate	Moderate	Low	Moderate
Ground Transportation Incident	Moderate	Low	Moderate	Moderate	Low	Moderate
Dam Failure	High	Moderate	Moderate	Moderate	Moderate	Moderate
Terrorism	Moderate	Moderate	Moderate	Moderate	Low	Moderate
Railroad Accident	Moderate	Low	Moderate	Moderate	Low	Moderate
Volcano	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
Urban Conflagration	Moderate	High	Moderate	High	Moderate	Moderate
Avalanche and Landslide	Moderate	Low	Moderate	Low	Low	Low
Aviation Accident	Moderate	Low	Low	Moderate	Low	Low
Civil Unrest, and Violence	Low	Moderate	Low	Moderate	Low	Low

2012 Mitigation Plan Hazards

Our first round of short public meetings will outline the process, why it matters and what we are trying to achieve. This is also an opportunity to identify other individuals who can participate in the process.

Initial Community Meetings			
The first round of community meetings will be in fall of 2017. Details will be listed here once they are setup.			
Community	Date & Time	Location	More Info
Belgrade	Tuesday, October 17 2:00 pm	Central Valley Fire District 205 East Main, Belgrade	
Bozeman	Tuesday, October 24 7:00 pm	Bozeman Fire Station 3 1705 Vaquero, Bozeman	
Manhattan & Amsterdam	Tuesday, October 17 11:00 am	Gallatin Conservation District 120 North 5th, Manhattan	
Three Forks, Willow Creek & Clarkston	Tuesday, October 17 9:00 am	Three Forks Fire Station 13 East Date, Three Forks	
West Yellowstone	Thursday, October 12 9:30 am	West Yellowstone City Hall 440 Yellowstone, West Yellowstone	
Big Sky	Thursday, October 12 1:30 pm	Big Sky Water and Sewer 561 Little Coyote Rd, Big Sky	
Gallatin Gateway	Thursday, October 12 4:00 pm	Gallatin Gateway Fire Station 320 Webb, Gallatin Gateway	

2017 Initial Meeting Schedule

Later in 2018 we will be conducting more in depth meetings around Gallatin County to evaluate updated hazard models of our county, rank the hazards and identify potential ways to mitigate these hazards.

To learn more about, and participate in the process, please visit ReadyGallatin.com/mitigation.



Flooding from East Gallatin River



Maple Fire outside West Yellowstone

9/26/2017

Contribute to Your Emergency Plans

Facebook Ads

Patrick

Help



Wastewater Release into Gallatin River

<https://business.facebook.com/notes/gallatin-county-emergency-management/contribute-to-your-emergency-plans/1597557903651948/>

4/5



Active Shooter Training in Bozeman

Like Comment Share Save



Write a comment...

Press Enter to post.

December 28, 2017

«First_Name» «Last_Name»
«Agency»

Dear «First_Name»,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the «Agency» in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the «Agency» have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

Table 4.74 Summary of Hazards for Gallatin County, Montana

Hazard	Probability of Major Disaster	Property Impact	Population Impact	Economic Impact	Future Development Impact	Relative Overall Risk
Wildfire	High	High	High	Moderate	Moderate	High
Earthquake	High	High	High	High	Moderate	High
Hazardous Materials Release	High	Moderate	High	High	Moderate	High
Flooding	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
Communicable Disease and Bioterrorism	Moderate	Low	High	High	Low	Moderate
Drought	Moderate	Moderate	Low	High	Moderate	Moderate
Winter Storms and Extended Cold	Moderate	Low	Moderate	Moderate	Low	Moderate
Utility Outage	Moderate	Low	High	Moderate	Low	Moderate
Severe Thunderstorms	Moderate	Moderate	Moderate	Moderate	Low	Moderate
Wind and Tornadoes	Moderate	Low	Moderate	Moderate	Low	Moderate
Ground Transportation Incident	Moderate	Low	Moderate	Moderate	Low	Moderate
Dam Failure	High	Moderate	Moderate	Moderate	Moderate	Moderate
Terrorism	Moderate	Moderate	Moderate	Moderate	Low	Moderate
Railroad Accident	Moderate	Low	Moderate	Moderate	Low	Moderate
Volcano	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
Urban Conflagration	Moderate	High	Moderate	High	Moderate	Moderate
Avalanche and Landslide	Moderate	Low	Moderate	Low	Low	Low
Aviation Accident	Moderate	Low	Low	Moderate	Low	Low
Civil Unrest, and Violence	Low	Moderate	Low	Moderate	Low	Low

Work sessions are currently scheduled for:

Date	Time	Location	Address
February 6, 2018	1:00-4:30	Three Forks Ambulance Station	2 East Hickory Three Forks
February 7, 2018	8:30-12:00	Gallatin County Coordination Center	219 East Tamarack Bozeman

February 7, 2018	8:30-12:00	Virtual Webinar	Click Here
February 8, 2018	8:00-11:30	West Yellowstone City Hall	440 Yellowstone Ave West Yellowstone
February 8, 2018	1:30-5:00	Big Sky Water & Sewer	561 Little Coyote Big Sky
February 8, 2018	8:30-12:00	Central Valley Fire District – Training Center	205 East Main Belgrade

Background

Hazard Mitigation Plans are required by the Federal Emergency Management Agency in order for cities and counties to be eligible for federal mitigation funding, either before or after a disaster. These programs are frequently utilized to reduce repetitive loss public infrastructure, retrofit buildings to seismic standards, flood mitigation projects, backup power retrofits and other similar projects. To maintain eligibility, our plan must be updated and approved by FEMA every 5 years. A large component of the approval process is demonstrating holistic community participation from agencies such as the «Agency».

Community Wildfire Protection Plans (CWPP) have some similar goals where they identify wildfire risk and how that could be minimized, so we are taking this opportunity to combine these documents into a single plan. An important item that will come out of the CWPP portion of the revision is an update to our wildland urban interface boundary. Identification of this boundary has impacts on the land owners in terms of access to wildfire mitigation funds, how adjacent land management agencies manage their lands, and potentially how some insurers view the property.

Additional information on the plan update process is available at ReadyGallatin.com/mitigation.

Many agencies are already planning on attending, and I greatly appreciate it. This addressed message will serve as our notice of record for «Agency» in our planning file.

Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

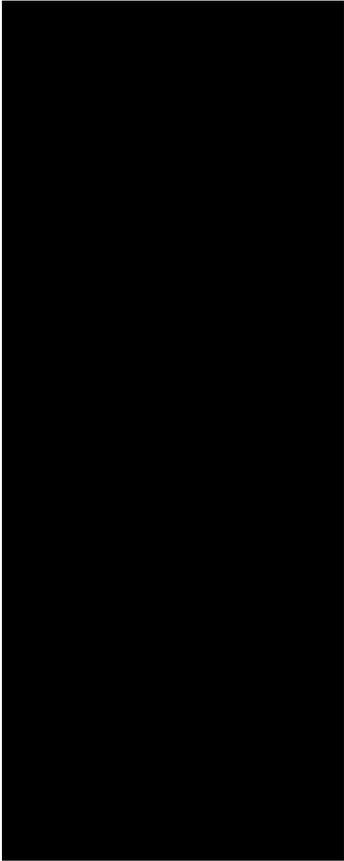
Sincerely,



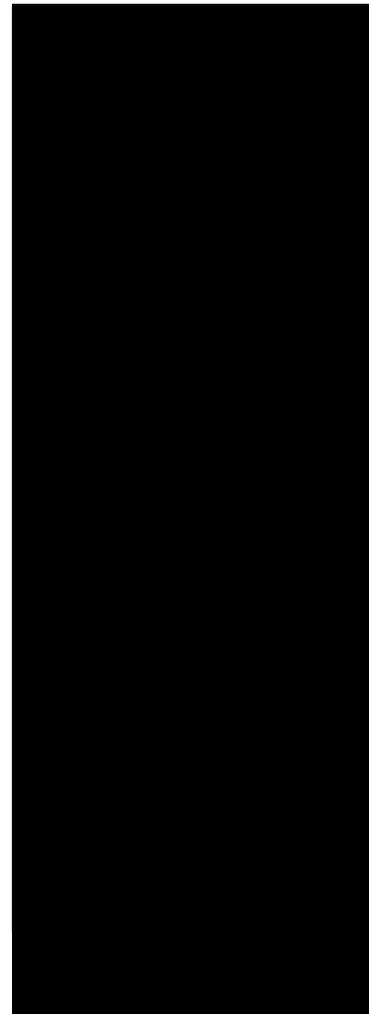
Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse

First Name	Last Name	Agency
Jason	Brey	Hebgen Lake Ranger District
Scott	Newell	West Yellowstone Police Department
Shane	Grube	Hebgen Basin Fire District
Dan	Sabolsky	Town of West Yellowstone
Tara	Ross	Yellowstone National Park
Todd	Opperman	Yellowstone National Park
Jerry	Johnson	Town of West Yellowstone
Fred	Jones	Gallatin National Forest
Mike	Gagen	Gallatin National Forest
Kyle	DeMars	Montana Department of Transportation
Brandon	Kelly	Gallatin County Sheriff's Office
Matt	Stubblefield	Gallatin County Sheriff's Office
Mike	Gavagan	Gallatin County Sheriff's Office
Dan	Springer	Gallatin County Sheriff's Office
Jake	Wagner	Gallatin County Sheriff's Office
Bill	Farhat	Big Sky Fire Department
Greg	Megaard	Big Sky Fire Department
James	Jessop	Hebgen Basin Fire District
Mike	Unruh	Big Sky Resort
Taylor	Middleton	Big Sky Resort
Bob	Dixon	Big Sky Resort
Ron	Edwards	Big Sky Water and Sewer
Dustin	Tetrault	Madison County
Jason	Manley	Yellowstone Club
Alek	Iskenderian	Lone Mountain Land Company
Whitney	Brunner	Big Sky Resort Tax Board
Marysue	Costello	West Yellowstone Chamber of Commerce
Joe	Skinner	Gallatin County Commission
Steve	White	Gallatin County Commission
Don	Seifert	Gallatin County Commission
Jim	Doar	Gallatin County
Bill	Brownell	Gallatin County Road and Bridge Department
Craig	Campbell	Montana Department of Natural Resources and Conservation
Jeremiah	Hillier	Gallatin Gateway Fire District
George	Reich	Willow Creek Fire District
Keith	Aune	Three Forks Fire District
Becky	Arbuckle	Three Forks Ambulance
TJ	Catterlin	Three Forks Ambulance



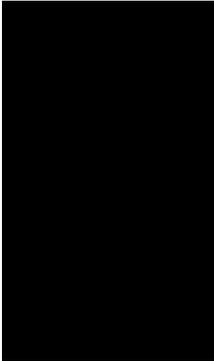
Samantha	Tribble	Three Forks Ambulance
Andrew	Egstad	American Medical Response
Steve	Hamilton	City of Three Forks
Kelly	Smith	City of Three Forks
Crystal	Turner	City of Three Forks
Justin	Mitchell	Clarkston Fire Service Area
Daniel	McDonough	Gallatin County Sheriff's Office
Mike	Ulmen	Manhattan Fire District
Dennis	Hengel	Manhattan Police Department
Pam	Humphrey	Town of Manhattan
Greg	Schack	Town of Manhattan
Jason	Hofman	Amsterdam Fire District
Ron	Lindroth	Central Valley Fire District
EJ	Clark	Belgrade Police Department
Russ	Nelson	City of Belgrade
Ted	Barkley	City of Belgrade
Steve	Klotz	Belgrade Public Works
Jason	Karp	Belgrade Planning Department
Andrea	Surratt	City of Bozeman
Cyndy	Andrus	City of Bozeman
Josh	Waldo	Bozeman Fire Department
Steve	Crawford	Bozeman Police Department
Craig	Woolard	Bozeman Public Works Department
Martin	Matsen	Bozeman Community Development Department
Ted	Mather	Bridger Canyon Fire District
Mike	Cech	Fort Ellis Fire Service Area
Jason	Revisky	Hayalite Fire District
Corey	Lewellen	Bozeman Ranger District
Sean	O'Callaghan	Gallatin County Planning Department
Mary	Hendrix	Gallatin Conservation District
Josh	Bilbao	Gallatin County Extension
Paul	Schneider	Bozeman Yellowstone Airport
Bill	Dove	Bozeman Yellowstone Airport
Susan	Spanjol	American Red Cross
Hayley	Tuggle	Montana State University
Frank	Parrish	Montana State University
Jim	Anderson	Gallatin County 911
Betty	Kalakay	Gallatin City-County Health Department
Matt	Kelley	Gallatin City-County Health Department



Bob
Nadene
Greg
Mike
Mark
Mark
Steve
Tony
Keri
Megan
John
Terina
Crystal

Fry
Wadsworth
Coleman
Koehnke
Wilfore
Deleray
Story
Bacino
Bilbo
Syner
Thompson
Goicochea
Beckman

Montana Disaster and Emergency Services
Montana Disaster and Emergency Services
Park County Disaster and Emergency Services
Broadwater County Disaster and Emergency Services
Montana Highway Patrol
Montana Fish, Wildlife and Parks
Montana Department of Natural Resources and Conservation
Montana Rail Link
Natural Resources Conservation Service
National Weather Service
Bureau of Land Management
Bureau of Land Management
Montana Department of Natural Resources and Conservation



BOZEMAN DAILY CHRONICLE
BELGRADE NEWS
C/O ISJ PAYMENT PROCESSING CTR
P.O. BOX 1570
POCATELLO ID 83204-1570
(406)582-2637

ORDER CONFIRMATION

Salesperson: ANN HARMS-24 Printed at 09/26/17 12:46 by aha24

Acct #: [REDACTED] Ad #: 1676229 Status: N
[REDACTED] EMERGENCY MANAGEMENT Start: 09/28/2017 Stop: 10/05/2017
[REDACTED] DSAY Times Ord: 2 Times Run: ***
[REDACTED] 1230 STDB 1.00 X 6.00 Words: 100
Total STDB 6.00
Class: 0001 LEGAL NOTICES
Rate: CNTYL Cost: 21.00
Affidavits: 1

Contact: Ad Descrpt: PUBLIC MEETINGS FOR REVIS
Phone: [REDACTED] Given by: *
Fax#: Created: aha24 09/26/17 12:45
Email: [REDACTED] Last Changed: aha24 09/26/17 12:46
Agency:

PUB ZONE EDT TP START INS STOP SMTWTFS
BDC A 97 W 09/28/17 2 10/05/17 T
BCWN A 97 W 09/28/17 2 10/05/17 T

AUTHORIZATION

Under this agreement rates are subject to change with 30 days notice. In the event of a cancellation before schedule completion, I understand that the rate charged will be based upon the rate for the number of insertions used.

Please call (406) 582-2600 for classified and 587-4491 for display if you have any questions on this ad.

Fax your signed authorization to (406)587-7995. Our mailing address is: Bozeman Daily Chronicle, P.O. 1190, Bozeman, MT 59771

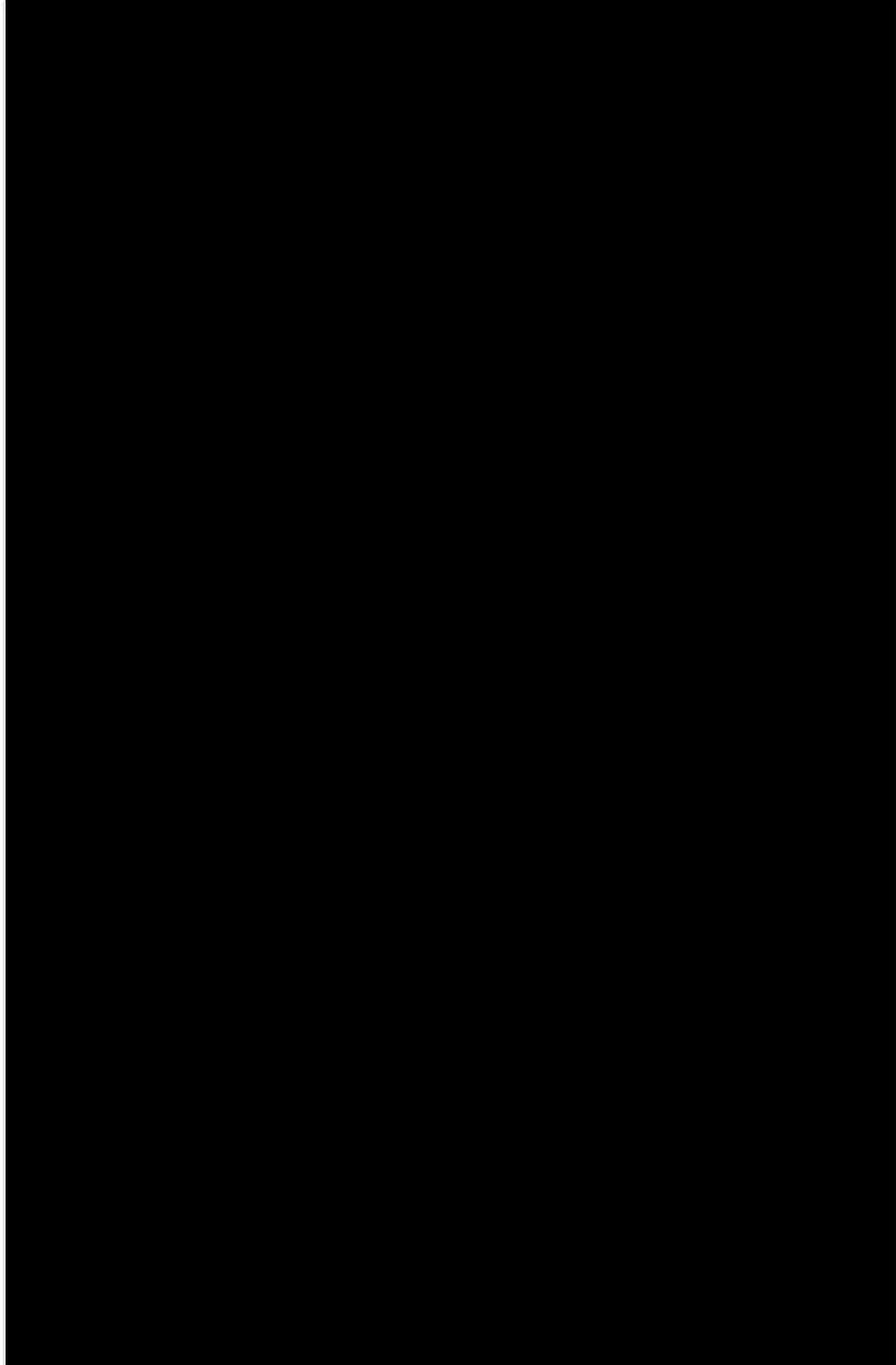
Name (print or type)

Name (signature)

Public Meetings

For revision of Hazard Mitigation and Community Wildfire Protection Plans. Schedule at ReadyGallatin.com/mitigation

From: [Patrick Lonergan](#)
To: [Lonergan, Patrick \(plonergan@bozeman.net\)](#)
Bcc:



[REDACTED]

Subject: Hazard Mitigation Plan Project Review
Date: Thursday, July 26, 2018 08:31:54
Attachments: image001.png

Good Morning,

Thank you for everyone who has participated in the [Hazard Mitigation Plan update](#) process so far. As I keep reminding everyone, community input is very important to the plan and FEMA's approval process. We are now at our last data gathering stage before completing a draft plan for review.

We are now in need of the community's feedback on our mitigation goals and associated projects. These are identified potential activities that would make our community more resilient and only identified projects can have mitigation funding utilized towards them.

We are soliciting this feedback electronically, so hopefully everyone can find 15 minutes to provide us their thoughts. We are asking that you score existing and already identified new projects based on several categories as well as identify any missing activities. We'll then utilize the combined scoring to prioritize the activities.

The survey is available at: <https://www.surveymonkey.com/r/FNKHGBZ>

Let me know if you have any questions. The feedback needs to be submitted no later than August 10th.

Thanks-

Patrick

Patrick Lonergan
Gallatin County Emergency Management
(406) 582-2395
Plonergan@bozeman.net
ReadyGallatin.com



Good Morning «First_Name»,

We have a couple upcoming activities with Gallatin County's Hazard Mitigation Plan revision that we want to make you aware of. Our consultant, RESPEC, is working hard to have reviewable drafts of our combined Hazard Mitigation and Community Wildfire Protection Plans available online by December 21st ahead of the final review session. We have scheduled the final review session for the plan at the Gallatin County Coordination Center on January 22nd at 1:00 pm. Please plan on attending to provide your feedback, or provide it to mike.rotar@respec.com prior to the meeting.

We are also holding a quick webinar about our proposed Wildland Urban Interface modelling on November 27th at 1:00 pm. Our approach to modelling the Wildland Urban Interface is a significant change from previous methods and we want everyone to have the opportunity to hear how it was developed, what it is illustrating and allow time to provide feedback prior to January 22nd.

We look forward to your participation in this final part of the process.

Sincerely,

Patrick

Upcoming Activities:

Activity	Time	Location
Wildland Urban Interface Modelling Webinar	November 27, 2018 1:00 PM	Online at: https://meet.lync.com/readygallatin.com/patrick/OKKRYP5Q
Draft Planning Documents Posted	December 21, 2018	https://www.readygallatin.com/mitigation/
Hazard Mitigation Plan Final Review	January 22, 2019 1:00 PM	Gallatin County Coordination Center 219 East Tamarack Bozeman, MT Virtually at: https://meet.lync.com/readygallatin.com/patrick/A98L1BDF

*Click on the activity name above to download meeting invite.

Contact Information:

Patrick Lonergan
Gallatin County Emergency Management
(406) 582-2395

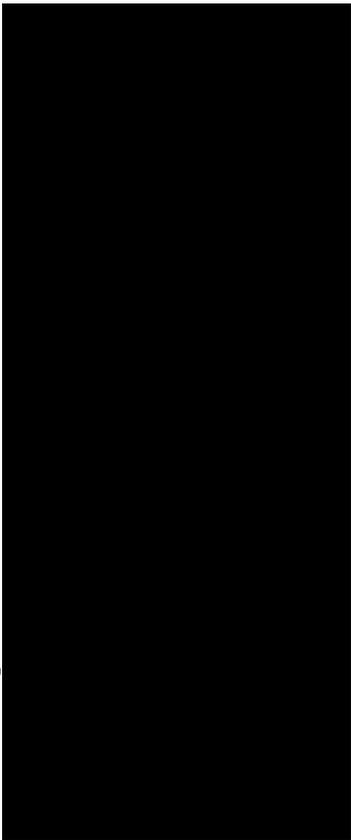
Mike Rotar
RESPEC
(406) 284-2527

plonergan@bozeman.net

Mike.rotar@respec.com

This message has been sent to «First_Name» «Last_Name» as a representative of «Agency».

First Name	Last Name	Agency
Jason	Brey	Hebgen Lake Ranger District
Scott	Newell	West Yellowstone Police Department
Shane	Grube	Hebgen Basin Fire District
Dan	Sabolsky	Town of West Yellowstone
Tara	Ross	Yellowstone National Park
Todd	Opperman	Yellowstone National Park
Jerry	Johnson	Town of West Yellowstone
Fred	Jones	Gallatin National Forest
Mike	Gagen	Gallatin National Forest
Kyle	DeMars	Montana Department of Transportation
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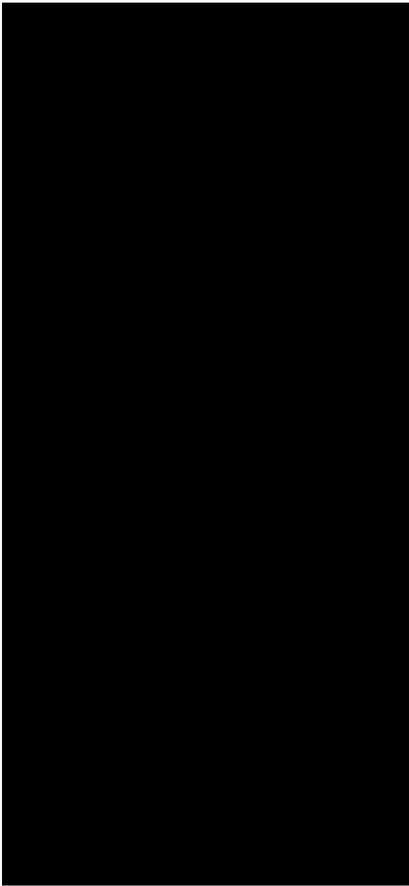


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Mike	Koehnke
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Mark	Delera
Steve	Story
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Megan	Syner
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Terina	Goicoechea
Crystal	Beckman
Dominique	Woodham
Mary	Brents
Valerie	Kolman
Marilyn	King
Seth	Barker
Heather	Higinbotham
Jim	Yocom
Seth	Ward
Valerie	kolman
Amy	Washtak
Gary	Gannon
Cyndy	Andrus
Susan	Spanjol
Natalie	Meyer
Kristin	Horn
Nikolas	Griffith
Jessica	Oehmcke
Anna	
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Broadwater County Disaster and Emergency Services
 Montana Highway Patrol
 Montana Fish, Wildlife and Parks
 Montana Department of Natural Resources and Conservation
 Montana Rail Link
 Natural Resources Conservation Service
 National Weather Service
 Bureau of Land Management
 Bureau of Land Management
 Montana Department of Natural Resources and Conservation
 MSU Extension



Good Morning «First_Name»,

I want to provide a quick update on our Hazard Mitigation Plan update process. We had a good virtual meeting on November 27th about our Wildland Urban Interface modeling (sorry for the last minute change on teleconferencing providers). Overall people felt the draft modeling was heading in the right direction and represents a better data driven representation of our community. We also started some discussion about land use planning and how these models will play into it. It's taken a little work, but thanks to Gallatin County GIS both draft [Wildland Urban Interface Modeling](#) and the draft [Wildfire Risk Modeling](#) is now posted online in an interactive map that you can review it in detail.

We're still aiming to have draft material posted online at [ReadyGallatin.com/mitigation](#) beginning December 21, 2018 for the Hazard Mitigation products and Community Wildfire Protection products. Our contractor is slaving away on these documents and is worried about having everything complete on the 21st, so it is possible not everything will be posted first thing on the 21st.

The next in person activity is our January 22, 2019 review meeting from 1:00-3:00 on all the planning products.

I am truly interested in everyone's thoughts and feedback on all the products we are producing. This is especially true for identifying mitigation projects that support some of the new hazards we identified. Please provide any thoughts you have in our [online form](#) (<https://goo.gl/P6hr9o>) now or at the session on January 22nd. We do intend to use the existing teleconference information for January 22nd (Microsoft ensures me it will work correctly this time). That information is:

<https://meet.lync.com/readygallatin.com/patrick/A98L1BDF>

Call In Number: 406-247-0860

Conference ID: 24533626

All material related to the project is being posted at [ReadyGallatin.com/mitigation](#).

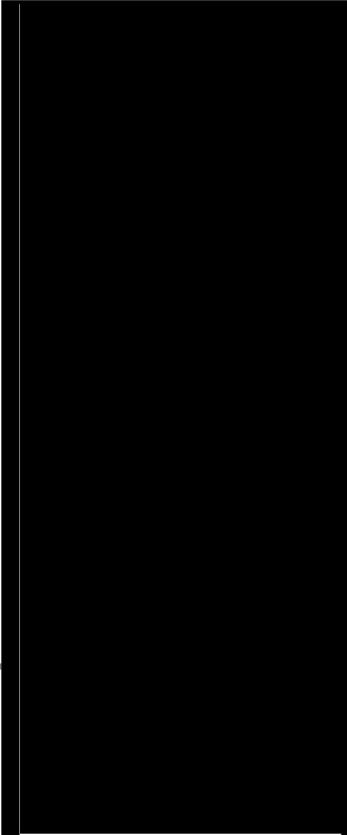
Thanks again for everyone who has participated along this journey.

Patrick

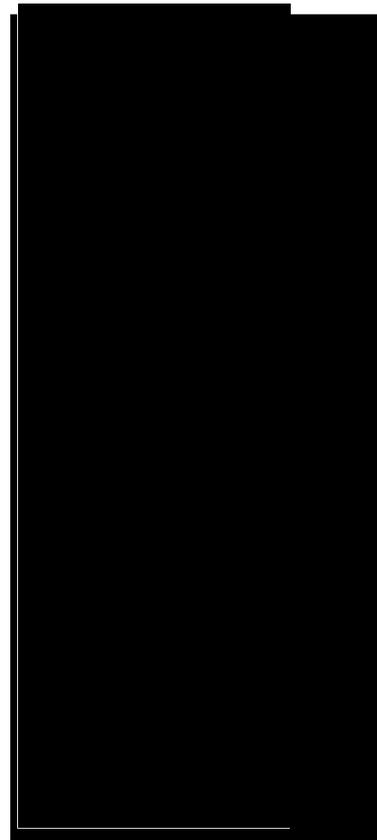
Gallatin County Emergency Management
(406) 582-2395
[ReadyGallatin.com](#)

This message was sent as a bulk message to all planning participants. This message was sent to «First_Name» «Last_Name» at «email» as a representative for «Agency».

First Name	Last Name	Agency
Jason	Brey	Hebgen Lake Ranger District
Scott	Newell	West Yellowstone Police Department
Shane	Grube	Hebgen Basin Fire District
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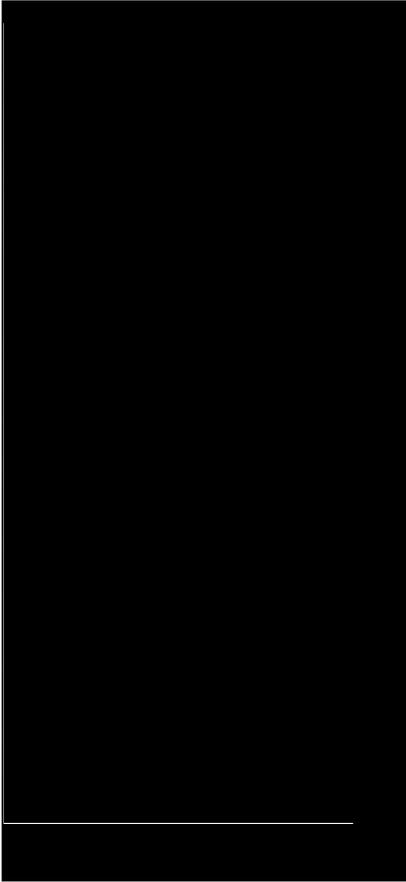


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 National Weather Service
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 Montana Department of Natural Resources and Conservation
 MSU Extension



Good Afternoon «First_Name»,

After much effort by many people around Gallatin County, we have a complete document containing all the pieces for our Gallatin County Hazard Mitigation Plan including a Community Wildfire Protection Plan attachment. This is a Final Draft, so please take a look and send me any **feedback you have prior to June 19th**. I know everyone is super busy this time of year, however both Montana DES and FEMA have advised they have a couple month backlog for technical plan reviews. Our plan is to get this sent off for technical review by the end of June with hopes of getting it back before the end of August. Once we receive it back, we will address any needed changes and begin the promulgation process.

The draft document can be accessed on our Mitigation Update Page at ReadyGallatin.com/mitigation or directly from:

- [Final Draft Mitigation Plan and CWPP](#) (Low Resolution 12 Mb)
- [Final Draft Mitigation Plan and CWPP](#) (Full Resolution 101 Mb)

Please direct your feedback directly to me in writing via email at patrick@readygallatin.com (written comments are easier to ensure we capture them correctly).

Again, I appreciate everyone's work on this process as we work to complete the project.

Thanks-

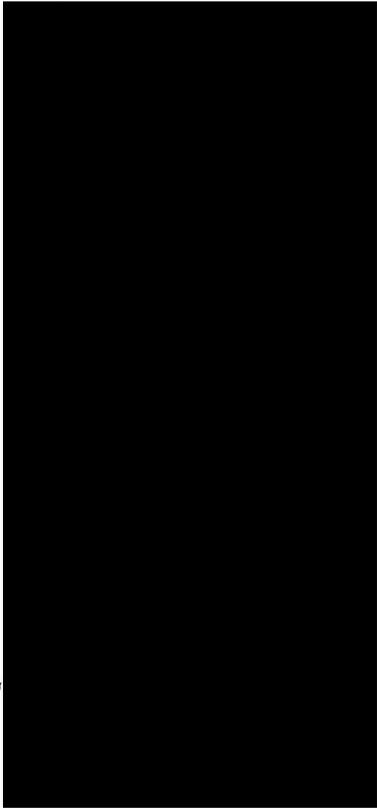
Patrick

~~~~~  
Patrick Lonergan  
Chief of Emergency Management and Fire  
Gallatin County Emergency Management  
(406) 548-0116  
[patrick@readygallatin.com](mailto:patrick@readygallatin.com)  
[ReadyGallatin.com](http://ReadyGallatin.com)  
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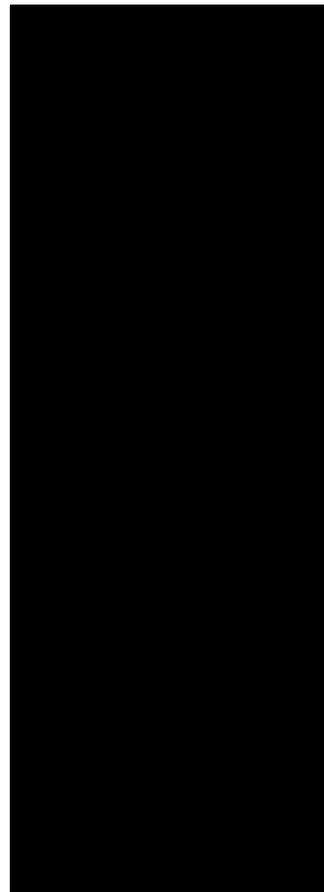


*This message was sent as a bulk mailing to «First\_Name» «Last\_Name» at «email» representing «Agency».*

| First Name | Last Name    | Agency                                                   |
|------------|--------------|----------------------------------------------------------|
| Jason      | Brey         | Hebgen Lake Ranger District                              |
| Scott      | Newell       | West Yellowstone Police Department                       |
| Shane      | Grube        | Hebgen Basin Fire District                               |
| Dan        | Sabolsky     | Town of West Yellowstone                                 |
| Tara       | Ross         | Yellowstone National Park                                |
| Todd       | Opperman     | Yellowstone National Park                                |
| Jerry      | Johnson      | Town of West Yellowstone                                 |
| Fred       | Jones        | Gallatin National Forest                                 |
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| Mike       | Gavagan      | Gallatin County Sheriff's Office                         |
| Dan        | Springer     | Gallatin County Sheriff's Office                         |
| Jake       | Wagner       | Gallatin County Sheriff's Office                         |
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| Greg       | Megaard      | Big Sky Fire Department                                  |
| Dustin     | Tetrault     | Big Sky Fire Department                                  |
| James      | Jessop       | Hebgen Basin Fire District                               |
| Mike       | Unruh        | Big Sky Resort                                           |
| Taylor     | Middleton    | Big Sky Resort                                           |
| Bob        | Dixon        | Big Sky Resort                                           |
| Ron        | Edwards      | Big Sky Water and Sewer                                  |
| Joe        | Brummell     | Madison County                                           |
| Jason      | Manley       | Yellowstone Club                                         |
| Alek       | Iskenderian  | Lone Mountain Land Company                               |
| Whitney    | Brunner      | Big Sky Resort Tax Board                                 |
| Marysue    | Costello     | West Yellowstone Chamber of Commerce                     |
| Joe        | Skinner      | Gallatin County Commission                               |
| Steve      | White        | Gallatin County Commission                               |
| Don        | Seifert      | Gallatin County Commission                               |
| Jim        | Doar         | Gallatin County                                          |
| Bill       | Brownell     | Gallatin County Road and Bridge Department               |
| Craig      | Campbell     | Montana Department of Natural Resources and Conservation |
| Jeremiah   | Hillier      | Gallatin Gateway Fire District                           |
| George     | Reich        | Willow Creek Fire District                               |
| Keith      | Aune         | Three Forks Fire District                                |
| Becky      | Arbuckle     | Three Forks Ambulance                                    |

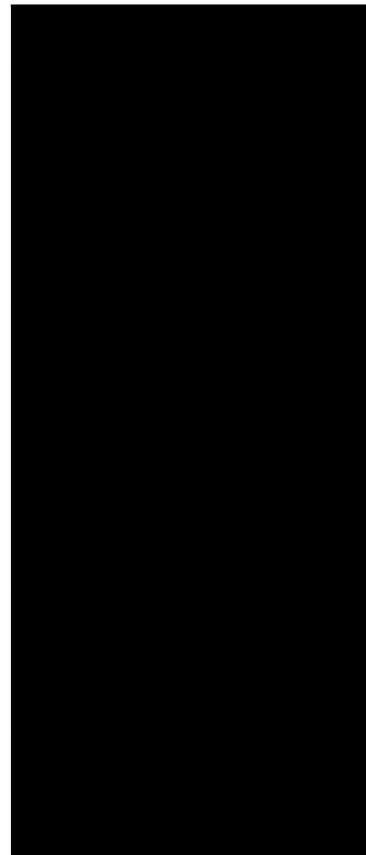


|          |             |                                                  |
|----------|-------------|--------------------------------------------------|
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| Craig    | Woolard     | Bozeman Public Works Department                  |
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| Frank    | Parrish     | Montana State University                         |
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|                          |             |
|--------------------------|-------------|
| Matt                     | Kelley      |
| Bob                      | Fry         |
| Nadene                   | Wadsworth   |
| Greg                     | Coleman     |
| Mike                     | Koehnke     |
| Mark                     | Wilfore     |
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| Tony                     | Bacino      |
| Keri                     | Bilbo       |
| Megan                    | Syner       |
| John                     | Thompson    |
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| Crystal                  | Beckman     |
| Dominique                | Woodham     |
| Mary                     | Brents      |
| Valerie                  | Kolman      |
| Marilyn                  | King        |
| Seth                     | Barker      |
| Heather                  | Higinbotham |
| Jim                      | Yocom       |
| Seth                     | Ward        |
| Valerie                  | kolman      |
| Amy                      | Washtak     |
| Gary                     | Gannon      |
| Cyndy                    | Andrus      |
| Susan                    | Spanjol     |
| Natalie                  | Meyer       |
| Kristin                  | Horn        |
| Nikolas                  | Griffith    |
| Jessica                  | Oehmcke     |
| Anna                     |             |
| Todd                     | Erdody      |
| Jessica                  | Haas        |
| Jessianne                | Wright      |
| Steve                    | Gonzalez    |
|                          |             |
| Three Rivers Clinic, LLC |             |

Gallatin City-County Health Department  
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Park County Disaster and Emergency Services  
Broadwater County Disaster and Emergency Services  
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Montana Fish, Wildlife and Parks  
Montana Department of Natural Resources and Conservation  
Montana Rail Link  
Natural Resources Conservation Service  
National Weather Service  
Bureau of Land Management  
Bureau of Land Management  
Montana Department of Natural Resources and Conservation  
MSU Extension



|         |           |
|---------|-----------|
| Brenna  | Randall   |
| Susan   | Spanjol   |
| candice | wilson    |
| Colin   | McKearman |
| Kevin   | Larsen    |
| Caleb   | Schreiber |

Gallatin County Emergency Management  
US Forest Service



From: Patrick Lonergan  
To:  
Bcc:



Subject: Community Mitigation Meetings Scheduled  
Date: Tuesday, December 5, 2017 14:56:39  
Attachments: imaa001.png

Good Afternoon,

Emergency Management has scheduled the first round of full meetings for the Hazard Mitigation and Community Wildfire Protection Plan updates in February. This [planning process](#) includes all the cities and unincorporated areas within Gallatin County and requires a collaborative planning process from all entities. Here is the kicker, in order for your agency to utilize any sort of federal mitigation funding (either pre or post disaster) incorporated political subdivisions must have participated in the development of, and have adopted, a current [FEMA](#) approved mitigation plan. The mitigation plan must also have a project that ties back to the activity you want to complete with the federal funds, so your help in updating this document is critical.

FEMA is very strict on having holistic participation on mitigation plans in order for them to be approved. So I ask that we have participation from the following groups if at all possible:

- Elected Officials, City & County Managers
- Public Safety Agencies (Law, Fire, EMS, 911, Health)
- Public Works (streets, water, Facilities, etc..)
- Planning, Engineering, Floodplain
- Natural Resources, Environmental, Sustainability, etc...
- Community Members
- Non-Governmental Organizations

We are also updating our Community Wildfire Protection Plan during the same process. This process is important to have participation from agencies who either own, or protect, land adjacent to federal lands as federal agencies must consult this document when choosing management decisions on adjacent federal lands.

We have scheduled a series of meetings around the county to help accommodate schedules and focus on geographically specific risks. You can attend any meeting you wish and provide your organization's input.

#### Meeting Schedule

| Community | Date & Time      | Location                                     | More Info |
|-----------|------------------|----------------------------------------------|-----------|
| Belgrade  | February 9, 2017 | Central Valley Fire District Training Center |           |

|                  |                                |                                                                        |                                          |
|------------------|--------------------------------|------------------------------------------------------------------------|------------------------------------------|
|                  | 8:30-12:00                     | 205 East Main, Belgrade                                                |                                          |
| Bozeman          | February 7, 2017<br>8:30-12:00 | Gallatin County Coordination Center<br>219 East Tamarack, Bozeman      | Available Virtually <a href="#">here</a> |
| Three Forks      | February 6, 2017<br>1:00-4:30  | Three Forks Ambulance Station<br>2 East Hickory, Three Forks           |                                          |
| West Yellowstone | February 8, 2017<br>8:00-11:30 | West Yellowstone City Hall<br>440 Yellowstone Avenue, West Yellowstone |                                          |
| Big Sky          | February 8, 2017<br>1:30-5:00  | Big Sky Water and Sewer<br>561 Little Coyote, Big Sky                  |                                          |

Additional information is available on this process at <https://www.readygallatin.com/mitigation/>

Please contact me with any questions that you may have!

Patrick

-----  
 Patrick Lonergan  
 Gallatin County Emergency Management  
 (406) 582-2395  
 Plonergan@bozeman.net  
 ReadyGallatin.com



**From:** [Patrick Lonergan](#)  
**To:**   
**Subject:** Kickoff Meeting | Belgrade Area  
**Date:** Tuesday, September 26, 2017 11:01:02  
**Attachments:** [image001.png](#)

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Good Morning Everyone,

Emergency Management is starting our initial round of meetings on the revision of the Mitigation and Community Wildfire Protection Plans in conjunction with our consultant RESPEC. While this project may seem very abstract to many of you, it is very important to your community that as many agencies as possible participate in the process as it is tied to everyone's ability to access mitigation funding both before and after a disaster. We have scheduled an initial meeting for the Belgrade area for **Tuesday, October 17 at 2:00 pm at the Central Valley Fire Meeting Room**. We expect this meeting to last no longer than an hour and will introduce the attendees to the process, why it matters, and what we are trying to achieve. We will have a more in depth meeting in 2018 to actually work through the community's risks. It is also important to note, that while we are updating our Hazard Mitigation Plan, we will also be incorporating our Community Wildfire Protection Plan into it as a single document.

This is a public meeting and anyone with an interest is encouraged to attend. So feel free to pass this on to whoever you want.

Hope to see someone from all your agencies on October 17<sup>th</sup>.

More information on the process at: <https://www.readygallatin.com/mitigation/>

Thanks-

Patrick

~~~~~  
Patrick Lonergan
Gallatin County Emergency Management
(406) 582-2395
Plonergan@bozeman.net
ReadyGallatin.com

From: [Patrick Lonergan](#)
To: [REDACTED]
Subject: [REDACTED]
Date: Tuesday, September 26, 2017 10:11:33
Attachments: [image001.png](#)

Good Morning Everyone,

Emergency Management is starting our initial round of meetings on the revision of the Mitigation and Community Wildfire Protection Plans in conjunction with our consultant RESPEC. While this project may seem very abstract to many of you, it is very important to your community that as many agencies as possible participate in the process as it is tied to everyone's ability to access mitigation funding both before and after a disaster. We have scheduled an initial meeting for the Big Sky area for **Thursday, October 12 at 1:30 pm at the Big Sky Water and Sewer Office**. We expect this meeting to last no longer than an hour and will introduce the attendees to the process, why it matters, and what we are trying to achieve. We will have a more in depth meeting in 2018 to actually work through the community's risks. It is also important to note, that while we are updating our Hazard Mitigation Plan, we will also be incorporating our Community Wildfire Protection Plan into it as a single document.

This is a public meeting and anyone with an interest is encouraged to attend. So feel free to pass this on to whoever you want.

Hope to see someone from all your agencies on October 12th.

More information on the process at: <https://www.readygallatin.com/mitigation/>

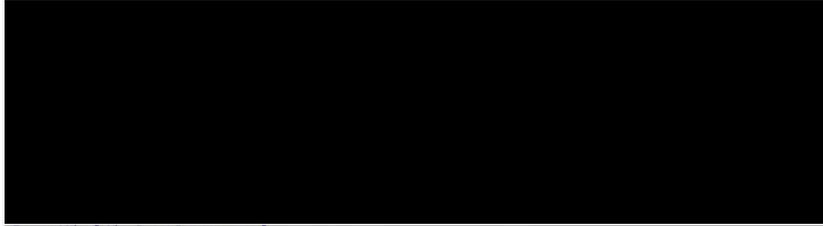
Thanks-

Patrick

~~~~~  
Patrick Lonergan  
Gallatin County Emergency Management  
(406) 582-2395  
[Plonergan@bozeman.net](mailto:Plonergan@bozeman.net)  
[ReadyGallatin.com](http://ReadyGallatin.com)

**From:** [Patrick Lonergan](#)

**To:**



**Cc:** [Rotar, Mike \[Mike.Rotar@respec.com\]](mailto:Mike.Rotar@respec.com)  
**Subject:** Kickoff Meeting | Bozeman Area  
**Date:** Tuesday, September 26, 2017 11:20:04  
**Attachments:** [image001.png](#)

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Good Morning Everyone,

Emergency Management is starting our initial round of meetings on the revision of the Mitigation and Community Wildfire Protection Plans in conjunction with our consultant RESPEC. While this project may seem very abstract to many of you, it is very important to your community that as many agencies as possible participate in the process as it is tied to everyone's ability to access mitigation funding both before and after a disaster. We have scheduled an initial meeting for the Bozeman area for **Tuesday, October 24 at 7:00 pm at the Bozeman Fire Station 3 Conference Room**. We expect this meeting to last no longer than an hour and will introduce the attendees to the process, why it matters, and what we are trying to achieve. We will have a more in depth meeting in 2018 to actually work through the community's risks. It is also important to note, that while we are updating our Hazard Mitigation Plan, we will also be incorporating our Community Wildfire Protection Plan into it as a single document.

This is a public meeting and anyone with an interest is encouraged to attend. So feel free to pass this on to whoever you want.

Hope to see someone from all your agencies on October 24<sup>th</sup>.

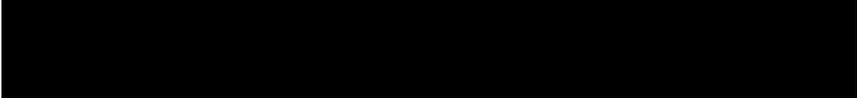
More information on the process at: <https://www.readygallatin.com/mitigation/>

Thanks-

Patrick

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Patrick Lonergan  
Gallatin County Emergency Management  
(406) 582-2395

**From:** [Patrick Lonergan](#)  
**To:**   
**Subject:** Kickoff Meeting | Gallatin Gateway  
**Date:** Tuesday, September 26, 2017 10:21:23  
**Attachments:** [image001.png](#)

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Good Morning Everyone,

Emergency Management is starting our initial round of meetings on the revision of the Mitigation and Community Wildfire Protection Plans in conjunction with our consultant RESPEC. While this project may seem very abstract to many of you, it is very important to your community that as many agencies as possible participate in the process as it is tied to everyone's ability to access mitigation funding both before and after a disaster. We have scheduled an initial meeting for the West Yellowstone area for **Thursday, October 12 at 4:00 pm in the Gallatin Gateway Fire Station on Webb St.** We expect this meeting to last no longer than an hour and will introduce the attendees to the process, why it matters, and what we are trying to achieve. We will have a more in depth meeting in 2018 to actually work through the community's risks. It is also important to note, that while we are updating our Hazard Mitigation Plan, we will also be incorporating our Community Wildfire Protection Plan into it as a single document.

This is a public meeting and anyone with an interest is encouraged to attend. So feel free to pass this on to whoever you want.

Hope to see someone from all your agencies on October 12<sup>th</sup>.

More information on the process at: <https://www.readygallatin.com/mitigation/>

Thanks-

Patrick

~~~~~  
Patrick Lonergan
Gallatin County Emergency Management
(406) 582-2395
Plonergan@bozeman.net
ReadyGallatin.com

From: [Patrick Lonergan](#)
To: 
Subject: Kickoff Meeting | Manhattan & Amsterdam
Date: Tuesday, September 26, 2017 10:48:43
Attachments: [image001.png](#)

Good Morning Everyone,

Emergency Management is starting our initial round of meetings on the revision of the Mitigation and Community Wildfire Protection Plans in conjunction with our consultant RESPEC. While this project may seem very abstract to many of you, it is very important to your community that as many agencies as possible participate in the process as it is tied to everyone's ability to access mitigation funding both before and after a disaster. We have scheduled an initial meeting for the West Yellowstone area for **Tuesday, October 17 at 11:00 am at the Gallatin Conservation District**. We expect this meeting to last no longer than an hour and will introduce the attendees to the process, why it matters, and what we are trying to achieve. We will have a more in depth meeting in 2018 to actually work through the community's risks. It is also important to note, that while we are updating our Hazard Mitigation Plan, we will also be incorporating our Community Wildfire Protection Plan into it as a single document.

This is a public meeting and anyone with an interest is encouraged to attend. So feel free to pass this on to whoever you want.

Hope to see someone from all your agencies on October 17th.

More information on the process at: <https://www.readygallatin.com/mitigation/>

Thanks-

Patrick

~~~~~  
Patrick Lonergan  
Gallatin County Emergency Management  
(406) 582-2395  
[Plonergan@bozeman.net](mailto:Plonergan@bozeman.net)  
[ReadyGallatin.com](http://ReadyGallatin.com)

**From:** [Patrick Lonergan](#)  
**To:**   
**Cc:** [Patrick Lonergan](#)  
**Bcc:** [Lonergan, Patrick \(plonergan@bozeman.net\)](mailto:plonergan@bozeman.net)  
**Subject:** Kickoff Meeting | Willow Creek, Three Forks & Clarkston  
**Date:** Tuesday, September 26, 2017 10:38:45  
**Attachments:** [image001.png](#)

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Good Morning Everyone,

Emergency Management is starting our initial round of meetings on the revision of the Mitigation and Community Wildfire Protection Plans in conjunction with our consultant RESPEC. While this project may seem very abstract to many of you, it is very important to your community that as many agencies as possible participate in the process as it is tied to everyone's ability to access mitigation funding both before and after a disaster. We have scheduled an initial meeting for the West Yellowstone area for **Tuesday, October 17 at 9:00 am at the Three Forks Fire Station**. We expect this meeting to last no longer than an hour and will introduce the attendees to the process, why it matters, and what we are trying to achieve. We will have a more in depth meeting in 2018 to actually work through the community's risks. It is also important to note, that while we are updating our Hazard Mitigation Plan, we will also be incorporating our Community Wildfire Protection Plan into it as a single document.

This is a public meeting and anyone with an interest is encouraged to attend. So feel free to pass this on to whoever you want.

Hope to see someone from all your agencies on October 17<sup>th</sup>.

More information on the process at: <https://www.readygallatin.com/mitigation/>

Thanks-

Patrick

~~~~~  
Patrick Lonergan
Gallatin County Emergency Management
(406) 582-2395
Plonergan@bozeman.net
ReadyGallatin.com

From: Patrick Lonergan
To:



Cc: [Rotar, Mike \[Mike.Rotar@raspec.com\]](mailto:Mike.Rotar@raspec.com)
Subject: Kickoff Meeting | Mitigation Planning
Date: Tuesday, September 26, 2017 11:58:23
Attachments: image001.png

Good Morning Everyone,

Over the next month Emergency Management will be conducting our initial meetings for the update of the Hazard Mitigation and Community Wildfire Protection Plans at several locations around the county. This time around we are trying to hold meetings in different parts of the county so we can have discussions about the hazards and need specific to those areas. You're getting this message because your organization has responsibilities across all of Gallatin County. As you may recall from 5 years ago, a major requirement of this process is documented participation from all agencies. Without participation in this process, a jurisdiction is not eligible for mitigation funding either before or after a disaster. I know it is likely not possible for everyone to make every session, but I do ask that your organization try and make a couple.

The initial meeting will be no longer than an hour and is intended to explain the process, why it matters, and what we hope to achieve. Later in 2018 we will be holding a round of more in depth sessions to actually discuss the various hazards.

The initial meetings are listed below and more information is available at: <https://www.readygallatin.com/mitigation/>

Community	Date & Time	Location	More Info
Belgrade	Tuesday, October 17 2:00 pm	Central Valley Fire District 205 East Main, Belgrade	
Bozeman	Tuesday, October 24 7:00 pm	Bozeman Fire Station 3 1705 Vaquero, Bozeman	
Manhattan & Amsterdam	Tuesday, October 17 11:00 am	Gallatin Conservation District 120 North 5th, Manhattan	
Three Forks, Willow Creek & Clarkston	Tuesday, October 17 9:00 am	Three Forks Fire Station 13 East Date, Three Forks	
West Yellowstone	Thursday, October 12 9:30 am	West Yellowstone City Hall 440 Yellowstone, West Yellowstone	
Big Sky	Thursday, October 12 1:30 pm	Big Sky Water and Sewer 561 Little Coyote Rd, Big Sky	
Gallatin Gateway	Thursday, October 12 4:00 pm	Gallatin Gateway Fire Station 320 Webb, Gallatin Gateway	

Patrick Lonergan
Gallatin County Emergency Management
(406) 582-2395
Plonergan@bozeman.net
ReadyGallatin.com



December 28, 2017

Jim Anderson
Gallatin County 911

Dear Jim,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Gallatin County 911 in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Gallatin County 911 have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

Table 4.74 Summary of Hazards for Gallatin County, Montana

Hazard	Probability of Major Disaster	Property Impact	Population Impact	Economic Impact	Future Development Impact	Relative Overall Risk
Wildfire	High	High	High	Moderate	Moderate	High
Earthquake	High	High	High	High	Moderate	High
Hazardous Materials Release	High	Moderate	High	High	Moderate	High
Flooding	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
Communicable Disease and Bioterrorism	Moderate	Low	High	High	Low	Moderate
Drought	Moderate	Moderate	Low	High	Moderate	Moderate
Winter Storms and Extended Cold	Moderate	Low	Moderate	Moderate	Low	Moderate
Utility Outage	Moderate	Low	High	Moderate	Low	Moderate
Severe Thunderstorms Wind and Tornadoes	Moderate	Moderate	Moderate	Moderate	Low	Moderate
Ground Transportation Incident	Moderate	Low	Moderate	Moderate	Low	Moderate
Dam Failure	High	Moderate	Moderate	Moderate	Moderate	Moderate
Terrorism	Moderate	Moderate	Moderate	Moderate	Low	Moderate
Railroad Accident	Moderate	Low	Moderate	Moderate	Low	Moderate
Volcano	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
Urban Conflagration	Moderate	High	Moderate	High	Moderate	Moderate
Avalanche and Landslide	Moderate	Low	Moderate	Low	Low	Low
Aviation Accident	Moderate	Low	Low	Moderate	Low	Low
Civil Unrest, and Violence	Low	Moderate	Low	Moderate	Low	Low

Work sessions are currently scheduled for:

Date	Time	Location	Address
February 6, 2018	1:00-4:30	Three Forks Ambulance Station	2 East Hickory Three Forks
February 7, 2018	8:30-12:00	Gallatin County Coordination Center	219 East Tamarack Bozeman

February 7, 2018	8:30-12:00	Virtual Webinar	Click Here
February 8, 2018	8:00-11:30	West Yellowstone City Hall	440 Yellowstone Ave West Yellowstone
February 8, 2018	1:30-5:00	Big Sky Water & Sewer	561 Little Coyote Big Sky
February 8, 2018	8:30-12:00	Central Valley Fire District – Training Center	205 East Main Belgrade

Background

Hazard Mitigation Plans are required by the Federal Emergency Management Agency in order for cities and counties to be eligible for federal mitigation funding, either before or after a disaster. These programs are frequently utilized to reduce repetitive loss public infrastructure, retrofit buildings to seismic standards, flood mitigation projects, backup power retrofits and other similar projects. To maintain eligibility, our plan must be updated and approved by FEMA every 5 years. A large component of the approval process is demonstrating holistic community participation from agencies such as the Gallatin County 911.

Community Wildfire Protection Plans (CWPP) have some similar goals where they identify wildfire risk and how that could be minimized, so we are taking this opportunity to combine these documents into a single plan. An important item that will come out of the CWPP portion of the revision is an update to our wildland urban interface boundary. Identification of this boundary has impacts on the land owners in terms of access to wildfire mitigation funds, how adjacent land management agencies manage their lands, and potentially how some insurers view the property.

Additional information on the plan update process is available at ReadyGallatin.com/mitigation.

Many agencies are already planning on attending, and I greatly appreciate it. This addressed message will serve as our notice of record for Gallatin County 911 in our planning file.

Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
plonergan@bozeman.net
ReadyGallatin.com

December 28, 2017

Cyndy Andrus
City of Bozeman

Dear Cyndy,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the City of Bozeman in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the City of Bozeman have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

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Drought	Moderate	Moderate	Low	High	Moderate	Moderate
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Severe Thunderstorms	Moderate	Moderate	Moderate	Moderate	Low	Moderate
Wind and Tornadoes	Moderate	Moderate	Moderate	Moderate	Low	Moderate
Ground Transportation Incident	Moderate	Low	Moderate	Moderate	Low	Moderate
Dam Failure	High	Moderate	Moderate	Moderate	Moderate	Moderate
Terrorism	Moderate	Moderate	Moderate	Moderate	Low	Moderate
Railroad Accident	Moderate	Low	Moderate	Moderate	Low	Moderate
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Work sessions are currently scheduled for:

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February 7, 2018	8:30-12:00	Virtual Webinar	Click Here
February 8, 2018	8:00-11:30	West Yellowstone City Hall	440 Yellowstone Ave West Yellowstone
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February 8, 2018	8:30-12:00	Central Valley Fire District – Training Center	205 East Main Belgrade

Background

Hazard Mitigation Plans are required by the Federal Emergency Management Agency in order for cities and counties to be eligible for federal mitigation funding, either before or after a disaster. These programs are frequently utilized to reduce repetitive loss public infrastructure, retrofit buildings to seismic standards, flood mitigation projects, backup power retrofits and other similar projects. To maintain eligibility, our plan must be updated and approved by FEMA every 5 years. A large component of the approval process is demonstrating holistic community participation from agencies such as the City of Bozeman.

Community Wildfire Protection Plans (CWPP) have some similar goals where they identify wildfire risk and how that could be minimized, so we are taking this opportunity to combine these documents into a single plan. An important item that will come out of the CWPP portion of the revision is an update to our wildland urban interface boundary. Identification of this boundary has impacts on the land owners in terms of access to wildfire mitigation funds, how adjacent land management agencies manage their lands, and potentially how some insurers view the property.

Additional information on the plan update process is available at ReadyGallatin.com/mitigation.

Many agencies are already planning on attending, and I greatly appreciate it. This addressed message will serve as our notice of record for City of Bozeman in our planning file.

Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
plonergan@bozeman.net
ReadyGallatin.com

December 28, 2017

Becky Arbuckle
Three Forks Ambulance

Dear Becky,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Three Forks Ambulance in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Three Forks Ambulance have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

Table 4.74 Summary of Hazards for Gallatin County, Montana

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Drought	Moderate	Moderate	Low	High	Moderate	Moderate
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Ground Transportation Incident	Moderate	Low	Moderate	Moderate	Low	Moderate
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Urban Conflagration	Moderate	High	Moderate	High	Moderate	Moderate
Avalanche and Landslide	Moderate	Low	Moderate	Low	Low	Low
Aviation Accident	Moderate	Low	Low	Moderate	Low	Low
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Work sessions are currently scheduled for:

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Background

Hazard Mitigation Plans are required by the Federal Emergency Management Agency in order for cities and counties to be eligible for federal mitigation funding, either before or after a disaster. These programs are frequently utilized to reduce repetitive loss public infrastructure, retrofit buildings to seismic standards, flood mitigation projects, backup power retrofits and other similar projects. To maintain eligibility, our plan must be updated and approved by FEMA every 5 years. A large component of the approval process is demonstrating holistic community participation from agencies such as the Three Forks Ambulance.

Community Wildfire Protection Plans (CWPP) have some similar goals where they identify wildfire risk and how that could be minimized, so we are taking this opportunity to combine these documents into a single plan. An important item that will come out of the CWPP portion of the revision is an update to our wildland urban interface boundary. Identification of this boundary has impacts on the land owners in terms of access to wildfire mitigation funds, how adjacent land management agencies manage their lands, and potentially how some insurers view the property.

Additional information on the plan update process is available at ReadyGallatin.com/mitigation.

Many agencies are already planning on attending, and I greatly appreciate it. This addressed message will serve as our notice of record for Three Forks Ambulance in our planning file.

Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
plonergan@bozeman.net
ReadyGallatin.com

December 28, 2017

Keith Aune
Three Forks Fire District

Dear Keith,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Three Forks Fire District in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Three Forks Fire District have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

Table 4.74 Summary of Hazards for Gallatin County, Montana

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Ground Transportation Incident	Moderate	Low	Moderate	Moderate	Low	Moderate
Dam Failure	High	Moderate	Moderate	Moderate	Moderate	Moderate
Terrorism	Moderate	Moderate	Moderate	Moderate	Low	Moderate
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Background

Hazard Mitigation Plans are required by the Federal Emergency Management Agency in order for cities and counties to be eligible for federal mitigation funding, either before or after a disaster. These programs are frequently utilized to reduce repetitive loss public infrastructure, retrofit buildings to seismic standards, flood mitigation projects, backup power retrofits and other similar projects. To maintain eligibility, our plan must be updated and approved by FEMA every 5 years. A large component of the approval process is demonstrating holistic community participation from agencies such as the Three Forks Fire District.

Community Wildfire Protection Plans (CWPP) have some similar goals where they identify wildfire risk and how that could be minimized, so we are taking this opportunity to combine these documents into a single plan. An important item that will come out of the CWPP portion of the revision is an update to our wildland urban interface boundary. Identification of this boundary has impacts on the land owners in terms of access to wildfire mitigation funds, how adjacent land management agencies manage their lands, and potentially how some insurers view the property.

Additional information on the plan update process is available at ReadyGallatin.com/mitigation.

Many agencies are already planning on attending, and I greatly appreciate it. This addressed message will serve as our notice of record for Three Forks Fire District in our planning file.

Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
plonergan@bozeman.net
ReadyGallatin.com

December 28, 2017

Tony Bacino
Montana Rail Link

Dear Tony,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Montana Rail Link in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Montana Rail Link have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

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Volcano	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
Urban Conflagration	Moderate	High	Moderate	High	Moderate	Moderate
Avalanche and Landslide	Moderate	Low	Moderate	Low	Low	Low
Aviation Accident	Moderate	Low	Low	Moderate	Low	Low
Civil Unrest, and Violence	Low	Moderate	Low	Moderate	Low	Low

Work sessions are currently scheduled for:

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February 8, 2018	1:30-5:00	Big Sky Water & Sewer	561 Little Coyote Big Sky
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Background

Hazard Mitigation Plans are required by the Federal Emergency Management Agency in order for cities and counties to be eligible for federal mitigation funding, either before or after a disaster. These programs are frequently utilized to reduce repetitive loss public infrastructure, retrofit buildings to seismic standards, flood mitigation projects, backup power retrofits and other similar projects. To maintain eligibility, our plan must be updated and approved by FEMA every 5 years. A large component of the approval process is demonstrating holistic community participation from agencies such as the Montana Rail Link.

Community Wildfire Protection Plans (CWPP) have some similar goals where they identify wildfire risk and how that could be minimized, so we are taking this opportunity to combine these documents into a single plan. An important item that will come out of the CWPP portion of the revision is an update to our wildland urban interface boundary. Identification of this boundary has impacts on the land owners in terms of access to wildfire mitigation funds, how adjacent land management agencies manage their lands, and potentially how some insurers view the property.

Additional information on the plan update process is available at ReadyGallatin.com/mitigation.

Many agencies are already planning on attending, and I greatly appreciate it. This addressed message will serve as our notice of record for Montana Rail Link in our planning file.

Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
plonergan@bozeman.net
ReadyGallatin.com

December 28, 2017

Ted Barkley
City of Belgrade

Dear Ted,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the City of Belgrade in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the City of Belgrade have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

Table 4.74 Summary of Hazards for Gallatin County, Montana

Hazard	Probability of Major Disaster	Property Impact	Population Impact	Economic Impact	Future Development Impact	Relative Overall Risk
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Communicable Disease and Bioterrorism	Moderate	Low	High	High	Low	Moderate
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Winter Storms and Extended Cold	Moderate	Low	Moderate	Moderate	Low	Moderate
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Work sessions are currently scheduled for:

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Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
plonergan@bozeman.net
ReadyGallatin.com

December 28, 2017

Crystal Beckman
 Montana Department of Natural Resources and Conservation

Dear Crystal,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Montana Department of Natural Resources and Conservation in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Montana Department of Natural Resources and Conservation have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

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Additional information on the plan update process is available at ReadyGallatin.com/mitigation.

Many agencies are already planning on attending, and I greatly appreciate it. This addressed message will serve as our notice of record for Montana Department of Natural Resources and Conservation in our planning file.

Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
plonergan@bozeman.net
ReadyGallatin.com

December 28, 2017

Josh Bilbao
Gallatin County Extension

Dear Josh,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Gallatin County Extension in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Gallatin County Extension have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

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Additional information on the plan update process is available at ReadyGallatin.com/mitigation.

Many agencies are already planning on attending, and I greatly appreciate it. This addressed message will serve as our notice of record for Gallatin County Extension in our planning file.

Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
plonergan@bozeman.net
ReadyGallatin.com

December 28, 2017

Keri Bilbo
 Natural Resources Conservation Service

Dear Keri,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Natural Resources Conservation Service in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Natural Resources Conservation Service have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

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Background

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Additional information on the plan update process is available at ReadyGallatin.com/mitigation.

Many agencies are already planning on attending, and I greatly appreciate it. This addressed message will serve as our notice of record for Natural Resources Conservation Service in our planning file.

Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
plonergan@bozeman.net
ReadyGallatin.com

December 28, 2017

Jason Brey
Hebgen Lake Ranger District

Dear Jason,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Hebgen Lake Ranger District in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Hebgen Lake Ranger District have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

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Background

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Many agencies are already planning on attending, and I greatly appreciate it. This addressed message will serve as our notice of record for Hebgen Lake Ranger District in our planning file.

Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
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ReadyGallatin.com

December 28, 2017

Bill Brownell
Gallatin County Road and Bridge Department

Dear Bill,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Gallatin County Road and Bridge Department in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Gallatin County Road and Bridge Department have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

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Many agencies are already planning on attending, and I greatly appreciate it. This addressed message will serve as our notice of record for Gallatin County Road and Bridge Department in our planning file.

Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
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ReadyGallatin.com

December 28, 2017

Whitney Brunner
Big Sky Resort Tax Board

Dear Whitney,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Big Sky Resort Tax Board in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Big Sky Resort Tax Board have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

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Utility Outage	Moderate	Low	High	Moderate	Low	Moderate
Severe Thunderstorms	Moderate	Moderate	Moderate	Moderate	Low	Moderate
Wind and Tornadoes	Moderate	Moderate	Moderate	Moderate	Low	Moderate
Ground Transportation Incident	Moderate	Low	Moderate	Moderate	Low	Moderate
Dam Failure	High	Moderate	Moderate	Moderate	Moderate	Moderate
Terrorism	Moderate	Moderate	Moderate	Moderate	Low	Moderate
Railroad Accident	Moderate	Low	Moderate	Moderate	Low	Moderate
Volcano	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
Urban Conflagration	Moderate	High	Moderate	High	Moderate	Moderate
Avalanche and Landslide	Moderate	Low	Moderate	Low	Low	Low
Aviation Accident	Moderate	Low	Low	Moderate	Low	Low
Civil Unrest, and Violence	Low	Moderate	Low	Moderate	Low	Low

Work sessions are currently scheduled for:

Date	Time	Location	Address
February 6, 2018	1:00-4:30	Three Forks Ambulance Station	2 East Hickory Three Forks
February 7, 2018	8:30-12:00	Gallatin County Coordination Center	219 East Tamarack Bozeman

February 7, 2018	8:30-12:00	Virtual Webinar	Click Here
February 8, 2018	8:00-11:30	West Yellowstone City Hall	440 Yellowstone Ave West Yellowstone
February 8, 2018	1:30-5:00	Big Sky Water & Sewer	561 Little Coyote Big Sky
February 8, 2018	8:30-12:00	Central Valley Fire District – Training Center	205 East Main Belgrade

Background

Hazard Mitigation Plans are required by the Federal Emergency Management Agency in order for cities and counties to be eligible for federal mitigation funding, either before or after a disaster. These programs are frequently utilized to reduce repetitive loss public infrastructure, retrofit buildings to seismic standards, flood mitigation projects, backup power retrofits and other similar projects. To maintain eligibility, our plan must be updated and approved by FEMA every 5 years. A large component of the approval process is demonstrating holistic community participation from agencies such as the Big Sky Resort Tax Board.

Community Wildfire Protection Plans (CWPP) have some similar goals where they identify wildfire risk and how that could be minimized, so we are taking this opportunity to combine these documents into a single plan. An important item that will come out of the CWPP portion of the revision is an update to our wildland urban interface boundary. Identification of this boundary has impacts on the land owners in terms of access to wildfire mitigation funds, how adjacent land management agencies manage their lands, and potentially how some insurers view the property.

Additional information on the plan update process is available at ReadyGallatin.com/mitigation.

Many agencies are already planning on attending, and I greatly appreciate it. This addressed message will serve as our notice of record for Big Sky Resort Tax Board in our planning file.

Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
plonergan@bozeman.net
ReadyGallatin.com

December 28, 2017

Craig Campbell
 Montana Department of Natural Resources and Conservation

Dear Craig,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Montana Department of Natural Resources and Conservation in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Montana Department of Natural Resources and Conservation have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

Table 4.74 Summary of Hazards for Gallatin County, Montana

Hazard	Probability of Major Disaster	Property Impact	Population Impact	Economic Impact	Future Development Impact	Relative Overall Risk
Wildfire	High	High	High	Moderate	Moderate	High
Earthquake	High	High	High	High	Moderate	High
Hazardous Materials Release	High	Moderate	High	High	Moderate	High
Flooding	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
Communicable Disease and Bioterrorism	Moderate	Low	High	High	Low	Moderate
Drought	Moderate	Moderate	Low	High	Moderate	Moderate
Winter Storms and Extended Cold	Moderate	Low	Moderate	Moderate	Low	Moderate
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Background

Hazard Mitigation Plans are required by the Federal Emergency Management Agency in order for cities and counties to be eligible for federal mitigation funding, either before or after a disaster. These programs are frequently utilized to reduce repetitive loss public infrastructure, retrofit buildings to seismic standards, flood mitigation projects, backup power retrofits and other similar projects. To maintain eligibility, our plan must be updated and approved by FEMA every 5 years. A large component of the approval process is demonstrating holistic community participation from agencies such as the Montana Department of Natural Resources and Conservation.

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Additional information on the plan update process is available at ReadyGallatin.com/mitigation.

Many agencies are already planning on attending, and I greatly appreciate it. This addressed message will serve as our notice of record for Montana Department of Natural Resources and Conservation in our planning file.

Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or ploneran@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
ploneran@bozeman.net
ReadyGallatin.com

December 28, 2017

TJ Catterlin
Three Forks Ambulance

Dear TJ,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Three Forks Ambulance in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Three Forks Ambulance have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

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Ground Transportation Incident	Moderate	Low	Moderate	Moderate	Low	Moderate
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Terrorism	Moderate	Moderate	Moderate	Moderate	Low	Moderate
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Urban Conflagration	Moderate	High	Moderate	High	Moderate	Moderate
Avalanche and Landslide	Moderate	Low	Moderate	Low	Low	Low
Aviation Accident	Moderate	Low	Low	Moderate	Low	Low
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Background

Hazard Mitigation Plans are required by the Federal Emergency Management Agency in order for cities and counties to be eligible for federal mitigation funding, either before or after a disaster. These programs are frequently utilized to reduce repetitive loss public infrastructure, retrofit buildings to seismic standards, flood mitigation projects, backup power retrofits and other similar projects. To maintain eligibility, our plan must be updated and approved by FEMA every 5 years. A large component of the approval process is demonstrating holistic community participation from agencies such as the Three Forks Ambulance.

Community Wildfire Protection Plans (CWPP) have some similar goals where they identify wildfire risk and how that could be minimized, so we are taking this opportunity to combine these documents into a single plan. An important item that will come out of the CWPP portion of the revision is an update to our wildland urban interface boundary. Identification of this boundary has impacts on the land owners in terms of access to wildfire mitigation funds, how adjacent land management agencies manage their lands, and potentially how some insurers view the property.

Additional information on the plan update process is available at ReadyGallatin.com/mitigation.

Many agencies are already planning on attending, and I greatly appreciate it. This addressed message will serve as our notice of record for Three Forks Ambulance in our planning file.

Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
plonergan@bozeman.net
ReadyGallatin.com

December 28, 2017

Mike Cech
Fort Ellis Fire Service Area

Dear Mike,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Fort Ellis Fire Service Area in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Fort Ellis Fire Service Area have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

Table 4.74 Summary of Hazards for Gallatin County, Montana

Hazard	Probability of Major Disaster	Property Impact	Population Impact	Economic Impact	Future Development Impact	Relative Overall Risk
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Earthquake	High	High	High	High	Moderate	High
Hazardous Materials Release	High	Moderate	High	High	Moderate	High
Flooding	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
Communicable Disease and Bioterrorism	Moderate	Low	High	High	Low	Moderate
Drought	Moderate	Moderate	Low	High	Moderate	Moderate
Winter Storms and Extended Cold	Moderate	Low	Moderate	Moderate	Low	Moderate
Utility Outage	Moderate	Low	High	Moderate	Low	Moderate
Severe Thunderstorms	Moderate	Moderate	Moderate	Moderate	Low	Moderate
Wind and Tornadoes	Moderate	Moderate	Moderate	Moderate	Low	Moderate
Ground Transportation Incident	Moderate	Low	Moderate	Moderate	Low	Moderate
Dam Failure	High	Moderate	Moderate	Moderate	Moderate	Moderate
Terrorism	Moderate	Moderate	Moderate	Moderate	Low	Moderate
Railroad Accident	Moderate	Low	Moderate	Moderate	Low	Moderate
Volcano	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
Urban Conflagration	Moderate	High	Moderate	High	Moderate	Moderate
Avalanche and Landslide	Moderate	Low	Moderate	Low	Low	Low
Aviation Accident	Moderate	Low	Low	Moderate	Low	Low
Civil Unrest, and Violence	Low	Moderate	Low	Moderate	Low	Low

Work sessions are currently scheduled for:

Date	Time	Location	Address
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February 7, 2018	8:30-12:00	Virtual Webinar	Click Here
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Background

Hazard Mitigation Plans are required by the Federal Emergency Management Agency in order for cities and counties to be eligible for federal mitigation funding, either before or after a disaster. These programs are frequently utilized to reduce repetitive loss public infrastructure, retrofit buildings to seismic standards, flood mitigation projects, backup power retrofits and other similar projects. To maintain eligibility, our plan must be updated and approved by FEMA every 5 years. A large component of the approval process is demonstrating holistic community participation from agencies such as the Fort Ellis Fire Service Area.

Community Wildfire Protection Plans (CWPP) have some similar goals where they identify wildfire risk and how that could be minimized, so we are taking this opportunity to combine these documents into a single plan. An important item that will come out of the CWPP portion of the revision is an update to our wildland urban interface boundary. Identification of this boundary has impacts on the land owners in terms of access to wildfire mitigation funds, how adjacent land management agencies manage their lands, and potentially how some insurers view the property.

Additional information on the plan update process is available at ReadyGallatin.com/mitigation.

Many agencies are already planning on attending, and I greatly appreciate it. This addressed message will serve as our notice of record for Fort Ellis Fire Service Area in our planning file.

Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
plonergan@bozeman.net
ReadyGallatin.com

December 28, 2017

EJ Clark
Belgrade Police Department

Dear EJ,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Belgrade Police Department in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Belgrade Police Department have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

Table 4.74 Summary of Hazards for Gallatin County, Montana

Hazard	Probability of Major Disaster	Property Impact	Population Impact	Economic Impact	Future Development Impact	Relative Overall Risk
Wildfire	High	High	High	Moderate	Moderate	High
Earthquake	High	High	High	High	Moderate	High
Hazardous Materials Release	High	Moderate	High	High	Moderate	High
Flooding	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
Communicable Disease and Bioterrorism	Moderate	Low	High	High	Low	Moderate
Drought	Moderate	Moderate	Low	High	Moderate	Moderate
Winter Storms and Extended Cold	Moderate	Low	Moderate	Moderate	Low	Moderate
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Wind and Tornadoes	Moderate	Moderate	Moderate	Moderate	Low	Moderate
Ground Transportation Incident	Moderate	Low	Moderate	Moderate	Low	Moderate
Dam Failure	High	Moderate	Moderate	Moderate	Moderate	Moderate
Terrorism	Moderate	Moderate	Moderate	Moderate	Low	Moderate
Railroad Accident	Moderate	Low	Moderate	Moderate	Low	Moderate
Volcano	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
Urban Conflagration	Moderate	High	Moderate	High	Moderate	Moderate
Avalanche and Landslide	Moderate	Low	Moderate	Low	Low	Low
Aviation Accident	Moderate	Low	Low	Moderate	Low	Low
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Background

Hazard Mitigation Plans are required by the Federal Emergency Management Agency in order for cities and counties to be eligible for federal mitigation funding, either before or after a disaster. These programs are frequently utilized to reduce repetitive loss public infrastructure, retrofit buildings to seismic standards, flood mitigation projects, backup power retrofits and other similar projects. To maintain eligibility, our plan must be updated and approved by FEMA every 5 years. A large component of the approval process is demonstrating holistic community participation from agencies such as the Belgrade Police Department.

Community Wildfire Protection Plans (CWPP) have some similar goals where they identify wildfire risk and how that could be minimized, so we are taking this opportunity to combine these documents into a single plan. An important item that will come out of the CWPP portion of the revision is an update to our wildland urban interface boundary. Identification of this boundary has impacts on the land owners in terms of access to wildfire mitigation funds, how adjacent land management agencies manage their lands, and potentially how some insurers view the property.

Additional information on the plan update process is available at ReadyGallatin.com/mitigation.

Many agencies are already planning on attending, and I greatly appreciate it. This addressed message will serve as our notice of record for Belgrade Police Department in our planning file.

Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
plonergan@bozeman.net
ReadyGallatin.com

December 28, 2017

Greg Coleman
 Park County Disaster and Emergency Services

Dear Greg,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Park County Disaster and Emergency Services in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Park County Disaster and Emergency Services have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

Table 4.74 Summary of Hazards for Gallatin County, Montana

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Background

Hazard Mitigation Plans are required by the Federal Emergency Management Agency in order for cities and counties to be eligible for federal mitigation funding, either before or after a disaster. These programs are frequently utilized to reduce repetitive loss public infrastructure, retrofit buildings to seismic standards, flood mitigation projects, backup power retrofits and other similar projects. To maintain eligibility, our plan must be updated and approved by FEMA every 5 years. A large component of the approval process is demonstrating holistic community participation from agencies such as the Park County Disaster and Emergency Services.

Community Wildfire Protection Plans (CWPP) have some similar goals where they identify wildfire risk and how that could be minimized, so we are taking this opportunity to combine these documents into a single plan. An important item that will come out of the CWPP portion of the revision is an update to our wildland urban interface boundary. Identification of this boundary has impacts on the land owners in terms of access to wildfire mitigation funds, how adjacent land management agencies manage their lands, and potentially how some insurers view the property.

Additional information on the plan update process is available at ReadyGallatin.com/mitigation.

Many agencies are already planning on attending, and I greatly appreciate it. This addressed message will serve as our notice of record for Park County Disaster and Emergency Services in our planning file.

Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
plonergan@bozeman.net
ReadyGallatin.com

December 28, 2017

Marysue Costello
West Yellowstone Chamber of Commerce

Dear Marysue,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the West Yellowstone Chamber of Commerce in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the West Yellowstone Chamber of Commerce have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

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Background

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Community Wildfire Protection Plans (CWPP) have some similar goals where they identify wildfire risk and how that could be minimized, so we are taking this opportunity to combine these documents into a single plan. An important item that will come out of the CWPP portion of the revision is an update to our wildland urban interface boundary. Identification of this boundary has impacts on the land owners in terms of access to wildfire mitigation funds, how adjacent land management agencies manage their lands, and potentially how some insurers view the property.

Additional information on the plan update process is available at ReadyGallatin.com/mitigation.

Many agencies are already planning on attending, and I greatly appreciate it. This addressed message will serve as our notice of record for West Yellowstone Chamber of Commerce in our planning file.

Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
plonergan@bozeman.net
ReadyGallatin.com

December 28, 2017

Steve Crawford
Bozeman Police Department

Dear Steve,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Bozeman Police Department in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Bozeman Police Department have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

Table 4.74 Summary of Hazards for Gallatin County, Montana

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Work sessions are currently scheduled for:

Date	Time	Location	Address
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Background

Hazard Mitigation Plans are required by the Federal Emergency Management Agency in order for cities and counties to be eligible for federal mitigation funding, either before or after a disaster. These programs are frequently utilized to reduce repetitive loss public infrastructure, retrofit buildings to seismic standards, flood mitigation projects, backup power retrofits and other similar projects. To maintain eligibility, our plan must be updated and approved by FEMA every 5 years. A large component of the approval process is demonstrating holistic community participation from agencies such as the Bozeman Police Department.

Community Wildfire Protection Plans (CWPP) have some similar goals where they identify wildfire risk and how that could be minimized, so we are taking this opportunity to combine these documents into a single plan. An important item that will come out of the CWPP portion of the revision is an update to our wildland urban interface boundary. Identification of this boundary has impacts on the land owners in terms of access to wildfire mitigation funds, how adjacent land management agencies manage their lands, and potentially how some insurers view the property.

Additional information on the plan update process is available at ReadyGallatin.com/mitigation.

Many agencies are already planning on attending, and I greatly appreciate it. This addressed message will serve as our notice of record for Bozeman Police Department in our planning file.

Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
plonergan@bozeman.net
ReadyGallatin.com

December 28, 2017

Mark Deleray
 Montana Fish, Wildlife and Parks

Dear Mark,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Montana Fish, Wildlife and Parks in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Montana Fish, Wildlife and Parks have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

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Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
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ReadyGallatin.com

December 28, 2017

Kyle DeMars
 Montana Department of Transportation

Dear Kyle,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Montana Department of Transportation in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Montana Department of Transportation have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

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Many agencies are already planning on attending, and I greatly appreciate it. This addressed message will serve as our notice of record for Montana Department of Transportation in our planning file.

Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
plonergan@bozeman.net
ReadyGallatin.com

December 28, 2017

Bob Dixon
Big Sky Resort

Dear Bob,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Big Sky Resort in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Big Sky Resort have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

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Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
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December 28, 2017

Jim Doar
Gallatin County

Dear Jim,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Gallatin County in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Gallatin County have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

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Patrick Lonergan
Director

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34 North Rouse
Bozeman, MT 59715
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December 28, 2017

Bill Dove
Bozeman Yellowstone Airport

Dear Bill,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Bozeman Yellowstone Airport in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Bozeman Yellowstone Airport have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

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Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
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December 28, 2017

Ron Edwards
Big Sky Water and Sewer

Dear Ron,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Big Sky Water and Sewer in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Big Sky Water and Sewer have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

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Background

Hazard Mitigation Plans are required by the Federal Emergency Management Agency in order for cities and counties to be eligible for federal mitigation funding, either before or after a disaster. These programs are frequently utilized to reduce repetitive loss public infrastructure, retrofit buildings to seismic standards, flood mitigation projects, backup power retrofits and other similar projects. To maintain eligibility, our plan must be updated and approved by FEMA every 5 years. A large component of the approval process is demonstrating holistic community participation from agencies such as the Big Sky Water and Sewer.

Community Wildfire Protection Plans (CWPP) have some similar goals where they identify wildfire risk and how that could be minimized, so we are taking this opportunity to combine these documents into a single plan. An important item that will come out of the CWPP portion of the revision is an update to our wildland urban interface boundary. Identification of this boundary has impacts on the land owners in terms of access to wildfire mitigation funds, how adjacent land management agencies manage their lands, and potentially how some insurers view the property.

Additional information on the plan update process is available at ReadyGallatin.com/mitigation.

Many agencies are already planning on attending, and I greatly appreciate it. This addressed message will serve as our notice of record for Big Sky Water and Sewer in our planning file.

Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
plonergan@bozeman.net
ReadyGallatin.com

December 28, 2017

Andrew Egstad
American Medical Response

Dear Andrew,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the American Medical Response in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the American Medical Response have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

Table 4.74 Summary of Hazards for Gallatin County, Montana

Hazard	Probability of Major Disaster	Property Impact	Population Impact	Economic Impact	Future Development Impact	Relative Overall Risk
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Earthquake	High	High	High	High	Moderate	High
Hazardous Materials Release	High	Moderate	High	High	Moderate	High
Flooding	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
Communicable Disease and Bioterrorism	Moderate	Low	High	High	Low	Moderate
Drought	Moderate	Moderate	Low	High	Moderate	Moderate
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Work sessions are currently scheduled for:

Date	Time	Location	Address
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Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
plonergan@bozeman.net
ReadyGallatin.com

December 28, 2017

Bill Farhat
Big Sky Fire Department

Dear Bill,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Big Sky Fire Department in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Big Sky Fire Department have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

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Many agencies are already planning on attending, and I greatly appreciate it. This addressed message will serve as our notice of record for Big Sky Fire Department in our planning file.

Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
plonergan@bozeman.net
ReadyGallatin.com

December 28, 2017

Bob Fry
 Montana Disaster and Emergency Services

Dear Bob,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Montana Disaster and Emergency Services in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Montana Disaster and Emergency Services have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

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Additional information on the plan update process is available at ReadyGallatin.com/mitigation.

Many agencies are already planning on attending, and I greatly appreciate it. This addressed message will serve as our notice of record for Montana Disaster and Emergency Services in our planning file.

Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
plonergan@bozeman.net
ReadyGallatin.com

December 28, 2017

Mike Gagen
Gallatin National Forest

Dear Mike,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Gallatin National Forest in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Gallatin National Forest have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

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Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
plonergan@bozeman.net
ReadyGallatin.com

December 28, 2017

Mike Gavagan
Gallatin County Sheriff's Office

Dear Mike,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Gallatin County Sheriff's Office in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Gallatin County Sheriff's Office have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

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Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
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ReadyGallatin.com

December 28, 2017

Terina Goicoechea
Bureau of Land Management

Dear Terina,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Bureau of Land Management in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Bureau of Land Management have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

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Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
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ReadyGallatin.com

December 28, 2017

Shane Grube
 Hebgen Basin Fire District

Dear Shane,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Hebgen Basin Fire District in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Hebgen Basin Fire District have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

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Terrorism	Moderate	Moderate	Moderate	Moderate	Low	Moderate
Railroad Accident	Moderate	Low	Moderate	Moderate	Low	Moderate
Volcano	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
Urban Conflagration	Moderate	High	Moderate	High	Moderate	Moderate
Avalanche and Landslide	Moderate	Low	Moderate	Low	Low	Low
Aviation Accident	Moderate	Low	Low	Moderate	Low	Low
Civil Unrest, and Violence	Low	Moderate	Low	Moderate	Low	Low

Work sessions are currently scheduled for:

Date	Time	Location	Address
February 6, 2018	1:00-4:30	Three Forks Ambulance Station	2 East Hickory Three Forks
February 7, 2018	8:30-12:00	Gallatin County Coordination Center	219 East Tamarack Bozeman

February 7, 2018	8:30-12:00	Virtual Webinar	Click Here
February 8, 2018	8:00-11:30	West Yellowstone City Hall	440 Yellowstone Ave West Yellowstone
February 8, 2018	1:30-5:00	Big Sky Water & Sewer	561 Little Coyote Big Sky
February 8, 2018	8:30-12:00	Central Valley Fire District – Training Center	205 East Main Belgrade

Background

Hazard Mitigation Plans are required by the Federal Emergency Management Agency in order for cities and counties to be eligible for federal mitigation funding, either before or after a disaster. These programs are frequently utilized to reduce repetitive loss public infrastructure, retrofit buildings to seismic standards, flood mitigation projects, backup power retrofits and other similar projects. To maintain eligibility, our plan must be updated and approved by FEMA every 5 years. A large component of the approval process is demonstrating holistic community participation from agencies such as the Hebgen Basin Fire District.

Community Wildfire Protection Plans (CWPP) have some similar goals where they identify wildfire risk and how that could be minimized, so we are taking this opportunity to combine these documents into a single plan. An important item that will come out of the CWPP portion of the revision is an update to our wildland urban interface boundary. Identification of this boundary has impacts on the land owners in terms of access to wildfire mitigation funds, how adjacent land management agencies manage their lands, and potentially how some insurers view the property.

Additional information on the plan update process is available at ReadyGallatin.com/mitigation.

Many agencies are already planning on attending, and I greatly appreciate it. This addressed message will serve as our notice of record for Hebgen Basin Fire District in our planning file.

Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
plonergan@bozeman.net
ReadyGallatin.com

December 28, 2017

Steve Hamilton
City of Three Forks

Dear Steve,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the City of Three Forks in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the City of Three Forks have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

Table 4.74 Summary of Hazards for Gallatin County, Montana

Hazard	Probability of Major Disaster	Property Impact	Population Impact	Economic Impact	Future Development Impact	Relative Overall Risk
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Earthquake	High	High	High	High	Moderate	High
Hazardous Materials Release	High	Moderate	High	High	Moderate	High
Flooding	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
Communicable Disease and Bioterrorism	Moderate	Low	High	High	Low	Moderate
Drought	Moderate	Moderate	Low	High	Moderate	Moderate
Winter Storms and Extended Cold	Moderate	Low	Moderate	Moderate	Low	Moderate
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Severe Thunderstorms	Moderate	Moderate	Moderate	Moderate	Low	Moderate
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Many agencies are already planning on attending, and I greatly appreciate it. This addressed message will serve as our notice of record for City of Three Forks in our planning file.

Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
plonergan@bozeman.net
ReadyGallatin.com

December 28, 2017

Dennis Hengel
Manhattan Police Department

Dear Dennis,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Manhattan Police Department in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Manhattan Police Department have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

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Background

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Community Wildfire Protection Plans (CWPP) have some similar goals where they identify wildfire risk and how that could be minimized, so we are taking this opportunity to combine these documents into a single plan. An important item that will come out of the CWPP portion of the revision is an update to our wildland urban interface boundary. Identification of this boundary has impacts on the land owners in terms of access to wildfire mitigation funds, how adjacent land management agencies manage their lands, and potentially how some insurers view the property.

Additional information on the plan update process is available at ReadyGallatin.com/mitigation.

Many agencies are already planning on attending, and I greatly appreciate it. This addressed message will serve as our notice of record for Manhattan Police Department in our planning file.

Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
plonergan@bozeman.net
ReadyGallatin.com

December 28, 2017

Mary Hendrix
Gallatin Conservation District

Dear Mary,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Gallatin Conservation District in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Gallatin Conservation District have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

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Background

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Community Wildfire Protection Plans (CWPP) have some similar goals where they identify wildfire risk and how that could be minimized, so we are taking this opportunity to combine these documents into a single plan. An important item that will come out of the CWPP portion of the revision is an update to our wildland urban interface boundary. Identification of this boundary has impacts on the land owners in terms of access to wildfire mitigation funds, how adjacent land management agencies manage their lands, and potentially how some insurers view the property.

Additional information on the plan update process is available at ReadyGallatin.com/mitigation.

Many agencies are already planning on attending, and I greatly appreciate it. This addressed message will serve as our notice of record for Gallatin Conservation District in our planning file.

Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
plonergan@bozeman.net
ReadyGallatin.com

December 28, 2017

Jeremiah Hillier
Gallatin Gateway Fire District

Dear Jeremiah,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Gallatin Gateway Fire District in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Gallatin Gateway Fire District have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

Table 4.74 Summary of Hazards for Gallatin County, Montana

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Background

Hazard Mitigation Plans are required by the Federal Emergency Management Agency in order for cities and counties to be eligible for federal mitigation funding, either before or after a disaster. These programs are frequently utilized to reduce repetitive loss public infrastructure, retrofit buildings to seismic standards, flood mitigation projects, backup power retrofits and other similar projects. To maintain eligibility, our plan must be updated and approved by FEMA every 5 years. A large component of the approval process is demonstrating holistic community participation from agencies such as the Gallatin Gateway Fire District.

Community Wildfire Protection Plans (CWPP) have some similar goals where they identify wildfire risk and how that could be minimized, so we are taking this opportunity to combine these documents into a single plan. An important item that will come out of the CWPP portion of the revision is an update to our wildland urban interface boundary. Identification of this boundary has impacts on the land owners in terms of access to wildfire mitigation funds, how adjacent land management agencies manage their lands, and potentially how some insurers view the property.

Additional information on the plan update process is available at ReadyGallatin.com/mitigation.

Many agencies are already planning on attending, and I greatly appreciate it. This addressed message will serve as our notice of record for Gallatin Gateway Fire District in our planning file.

Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
plonergan@bozeman.net
ReadyGallatin.com

December 28, 2017

Jason Hofman
Amsterdam Fire District

Dear Jason,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Amsterdam Fire District in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Amsterdam Fire District have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

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Additional information on the plan update process is available at ReadyGallatin.com/mitigation.

Many agencies are already planning on attending, and I greatly appreciate it. This addressed message will serve as our notice of record for Amsterdam Fire District in our planning file.

Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
plonergan@bozeman.net
ReadyGallatin.com

December 28, 2017

Pam Humphrey
Town of Manhattan

Dear Pam,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Town of Manhattan in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Town of Manhattan have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

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Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
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ReadyGallatin.com

December 28, 2017

Alek Iskenderian
Lone Mountain Land Company

Dear Alek,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Lone Mountain Land Company in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Lone Mountain Land Company have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

Table 4.74 Summary of Hazards for Gallatin County, Montana

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Work sessions are currently scheduled for:

Date	Time	Location	Address
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Background

Hazard Mitigation Plans are required by the Federal Emergency Management Agency in order for cities and counties to be eligible for federal mitigation funding, either before or after a disaster. These programs are frequently utilized to reduce repetitive loss public infrastructure, retrofit buildings to seismic standards, flood mitigation projects, backup power retrofits and other similar projects. To maintain eligibility, our plan must be updated and approved by FEMA every 5 years. A large component of the approval process is demonstrating holistic community participation from agencies such as the Lone Mountain Land Company.

Community Wildfire Protection Plans (CWPP) have some similar goals where they identify wildfire risk and how that could be minimized, so we are taking this opportunity to combine these documents into a single plan. An important item that will come out of the CWPP portion of the revision is an update to our wildland urban interface boundary. Identification of this boundary has impacts on the land owners in terms of access to wildfire mitigation funds, how adjacent land management agencies manage their lands, and potentially how some insurers view the property.

Additional information on the plan update process is available at ReadyGallatin.com/mitigation.

Many agencies are already planning on attending, and I greatly appreciate it. This addressed message will serve as our notice of record for Lone Mountain Land Company in our planning file.

Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
plonergan@bozeman.net
ReadyGallatin.com

December 28, 2017

James Jessop
 Hebgen Basin Fire District

Dear James,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Hebgen Basin Fire District in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Hebgen Basin Fire District have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

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Many agencies are already planning on attending, and I greatly appreciate it. This addressed message will serve as our notice of record for Hebgen Basin Fire District in our planning file.

Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
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ReadyGallatin.com

December 28, 2017

Jerry Johnson
Town of West Yellowstone

Dear Jerry,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Town of West Yellowstone in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Town of West Yellowstone have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

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Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
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December 28, 2017

Fred Jones
Gallatin National Forest

Dear Fred,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Gallatin National Forest in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Gallatin National Forest have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

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Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
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ReadyGallatin.com

December 28, 2017

Betty Kalakay
Gallatin City-County Health Department

Dear Betty,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Gallatin City-County Health Department in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Gallatin City-County Health Department have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

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Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
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December 28, 2017

Jason Karp
Belgrade Planning Department

Dear Jason,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Belgrade Planning Department in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Belgrade Planning Department have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

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Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
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December 28, 2017

Matt Kelley
Gallatin City-County Health Department

Dear Matt,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Gallatin City-County Health Department in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Gallatin City-County Health Department have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

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Background

Hazard Mitigation Plans are required by the Federal Emergency Management Agency in order for cities and counties to be eligible for federal mitigation funding, either before or after a disaster. These programs are frequently utilized to reduce repetitive loss public infrastructure, retrofit buildings to seismic standards, flood mitigation projects, backup power retrofits and other similar projects. To maintain eligibility, our plan must be updated and approved by FEMA every 5 years. A large component of the approval process is demonstrating holistic community participation from agencies such as the Gallatin City-County Health Department.

Community Wildfire Protection Plans (CWPP) have some similar goals where they identify wildfire risk and how that could be minimized, so we are taking this opportunity to combine these documents into a single plan. An important item that will come out of the CWPP portion of the revision is an update to our wildland urban interface boundary. Identification of this boundary has impacts on the land owners in terms of access to wildfire mitigation funds, how adjacent land management agencies manage their lands, and potentially how some insurers view the property.

Additional information on the plan update process is available at ReadyGallatin.com/mitigation.

Many agencies are already planning on attending, and I greatly appreciate it. This addressed message will serve as our notice of record for Gallatin City-County Health Department in our planning file.

Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
plonergan@bozeman.net
ReadyGallatin.com

December 28, 2017

Brandon Kelly
Gallatin County Sheriff's Office

Dear Brandon,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Gallatin County Sheriff's Office in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Gallatin County Sheriff's Office have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

Table 4.74 Summary of Hazards for Gallatin County, Montana

Hazard	Probability of Major Disaster	Property Impact	Population Impact	Economic Impact	Future Development Impact	Relative Overall Risk
Wildfire	High	High	High	Moderate	Moderate	High
Earthquake	High	High	High	High	Moderate	High
Hazardous Materials Release	High	Moderate	High	High	Moderate	High
Flooding	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
Communicable Disease and Bioterrorism	Moderate	Low	High	High	Low	Moderate
Drought	Moderate	Moderate	Low	High	Moderate	Moderate
Winter Storms and Extended Cold	Moderate	Low	Moderate	Moderate	Low	Moderate
Utility Outage	Moderate	Low	High	Moderate	Low	Moderate
Severe Thunderstorms	Moderate	Moderate	Moderate	Moderate	Low	Moderate
Wind and Tornadoes	Moderate	Moderate	Moderate	Moderate	Low	Moderate
Ground Transportation Incident	Moderate	Low	Moderate	Moderate	Low	Moderate
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Terrorism	Moderate	Moderate	Moderate	Moderate	Low	Moderate
Railroad Accident	Moderate	Low	Moderate	Moderate	Low	Moderate
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Civil Unrest, and Violence	Low	Moderate	Low	Moderate	Low	Low

Work sessions are currently scheduled for:

Date	Time	Location	Address
February 6, 2018	1:00-4:30	Three Forks Ambulance Station	2 East Hickory Three Forks
February 7, 2018	8:30-12:00	Gallatin County Coordination Center	219 East Tamarack Bozeman

February 7, 2018	8:30-12:00	Virtual Webinar	Click Here
February 8, 2018	8:00-11:30	West Yellowstone City Hall	440 Yellowstone Ave West Yellowstone
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Background

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Many agencies are already planning on attending, and I greatly appreciate it. This addressed message will serve as our notice of record for Gallatin County Sheriff's Office in our planning file.

Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
plonergan@bozeman.net
ReadyGallatin.com

December 28, 2017

Steve Klotz
Belgrade Public Works

Dear Steve,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Belgrade Public Works in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Belgrade Public Works have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

Table 4.74 Summary of Hazards for Gallatin County, Montana

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Background

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Community Wildfire Protection Plans (CWPP) have some similar goals where they identify wildfire risk and how that could be minimized, so we are taking this opportunity to combine these documents into a single plan. An important item that will come out of the CWPP portion of the revision is an update to our wildland urban interface boundary. Identification of this boundary has impacts on the land owners in terms of access to wildfire mitigation funds, how adjacent land management agencies manage their lands, and potentially how some insurers view the property.

Additional information on the plan update process is available at ReadyGallatin.com/mitigation.

Many agencies are already planning on attending, and I greatly appreciate it. This addressed message will serve as our notice of record for Belgrade Public Works in our planning file.

Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
plonergan@bozeman.net
ReadyGallatin.com

December 28, 2017

Mike Koehnke
Broadwater County Disaster and Emergency Services

Dear Mike,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Broadwater County Disaster and Emergency Services in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Broadwater County Disaster and Emergency Services have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

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Background

Hazard Mitigation Plans are required by the Federal Emergency Management Agency in order for cities and counties to be eligible for federal mitigation funding, either before or after a disaster. These programs are frequently utilized to reduce repetitive loss public infrastructure, retrofit buildings to seismic standards, flood mitigation projects, backup power retrofits and other similar projects. To maintain eligibility, our plan must be updated and approved by FEMA every 5 years. A large component of the approval process is demonstrating holistic community participation from agencies such as the Broadwater County Disaster and Emergency Services.

Community Wildfire Protection Plans (CWPP) have some similar goals where they identify wildfire risk and how that could be minimized, so we are taking this opportunity to combine these documents into a single plan. An important item that will come out of the CWPP portion of the revision is an update to our wildland urban interface boundary. Identification of this boundary has impacts on the land owners in terms of access to wildfire mitigation funds, how adjacent land management agencies manage their lands, and potentially how some insurers view the property.

Additional information on the plan update process is available at ReadyGallatin.com/mitigation.

Many agencies are already planning on attending, and I greatly appreciate it. This addressed message will serve as our notice of record for Broadwater County Disaster and Emergency Services in our planning file.

Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
plonergan@bozeman.net
ReadyGallatin.com

December 28, 2017

Corey Lewellen
Bozeman Ranger District

Dear Corey,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Bozeman Ranger District in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Bozeman Ranger District have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

Table 4.74 Summary of Hazards for Gallatin County, Montana

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Background

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Additional information on the plan update process is available at ReadyGallatin.com/mitigation.

Many agencies are already planning on attending, and I greatly appreciate it. This addressed message will serve as our notice of record for Bozeman Ranger District in our planning file.

Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
plonergan@bozeman.net
ReadyGallatin.com

December 28, 2017

Ron Lindroth
Central Valley Fire District

Dear Ron,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Central Valley Fire District in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Central Valley Fire District have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

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Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
plonergan@bozeman.net
ReadyGallatin.com

December 28, 2017

Jason Manley
Yellowstone Club

Dear Jason,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Yellowstone Club in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Yellowstone Club have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

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Background

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Additional information on the plan update process is available at ReadyGallatin.com/mitigation.

Many agencies are already planning on attending, and I greatly appreciate it. This addressed message will serve as our notice of record for Yellowstone Club in our planning file.

Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
plonergan@bozeman.net
ReadyGallatin.com

December 28, 2017

Ted Mather
Bridger Canyon Fire District

Dear Ted,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Bridger Canyon Fire District in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Bridger Canyon Fire District have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

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Utility Outage	Moderate	Low	High	Moderate	Low	Moderate
Severe Thunderstorms	Moderate	Moderate	Moderate	Moderate	Low	Moderate
Wind and Tornadoes	Moderate	Moderate	Moderate	Moderate	Low	Moderate
Ground Transportation Incident	Moderate	Low	Moderate	Moderate	Low	Moderate
Dam Failure	High	Moderate	Moderate	Moderate	Moderate	Moderate
Terrorism	Moderate	Moderate	Moderate	Moderate	Low	Moderate
Railroad Accident	Moderate	Low	Moderate	Moderate	Low	Moderate
Volcano	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
Urban Conflagration	Moderate	High	Moderate	High	Moderate	Moderate
Avalanche and Landslide	Moderate	Low	Moderate	Low	Low	Low
Aviation Accident	Moderate	Low	Low	Moderate	Low	Low
Civil Unrest, and Violence	Low	Moderate	Low	Moderate	Low	Low

Work sessions are currently scheduled for:

Date	Time	Location	Address
February 6, 2018	1:00-4:30	Three Forks Ambulance Station	2 East Hickory Three Forks
February 7, 2018	8:30-12:00	Gallatin County Coordination Center	219 East Tamarack Bozeman

February 7, 2018	8:30-12:00	Virtual Webinar	Click Here
February 8, 2018	8:00-11:30	West Yellowstone City Hall	440 Yellowstone Ave West Yellowstone
February 8, 2018	1:30-5:00	Big Sky Water & Sewer	561 Little Coyote Big Sky
February 8, 2018	8:30-12:00	Central Valley Fire District – Training Center	205 East Main Belgrade

Background

Hazard Mitigation Plans are required by the Federal Emergency Management Agency in order for cities and counties to be eligible for federal mitigation funding, either before or after a disaster. These programs are frequently utilized to reduce repetitive loss public infrastructure, retrofit buildings to seismic standards, flood mitigation projects, backup power retrofits and other similar projects. To maintain eligibility, our plan must be updated and approved by FEMA every 5 years. A large component of the approval process is demonstrating holistic community participation from agencies such as the Bridger Canyon Fire District.

Community Wildfire Protection Plans (CWPP) have some similar goals where they identify wildfire risk and how that could be minimized, so we are taking this opportunity to combine these documents into a single plan. An important item that will come out of the CWPP portion of the revision is an update to our wildland urban interface boundary. Identification of this boundary has impacts on the land owners in terms of access to wildfire mitigation funds, how adjacent land management agencies manage their lands, and potentially how some insurers view the property.

Additional information on the plan update process is available at ReadyGallatin.com/mitigation.

Many agencies are already planning on attending, and I greatly appreciate it. This addressed message will serve as our notice of record for Bridger Canyon Fire District in our planning file.

Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
plonergan@bozeman.net
ReadyGallatin.com

December 28, 2017

Martin Matsen
Bozeman Community Development Department

Dear Martin,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Bozeman Community Development Department in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Bozeman Community Development Department have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

Table 4.74 Summary of Hazards for Gallatin County, Montana

Hazard	Probability of Major Disaster	Property Impact	Population Impact	Economic Impact	Future Development Impact	Relative Overall Risk
Wildfire	High	High	High	Moderate	Moderate	High
Earthquake	High	High	High	High	Moderate	High
Hazardous Materials Release	High	Moderate	High	High	Moderate	High
Flooding	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
Communicable Disease and Bioterrorism	Moderate	Low	High	High	Low	Moderate
Drought	Moderate	Moderate	Low	High	Moderate	Moderate
Winter Storms and Extended Cold	Moderate	Low	Moderate	Moderate	Low	Moderate
Utility Outage	Moderate	Low	High	Moderate	Low	Moderate
Severe Thunderstorms Wind and Tornadoes	Moderate	Moderate	Moderate	Moderate	Low	Moderate
Ground Transportation Incident	Moderate	Low	Moderate	Moderate	Low	Moderate
Dam Failure	High	Moderate	Moderate	Moderate	Moderate	Moderate
Terrorism	Moderate	Moderate	Moderate	Moderate	Low	Moderate
Railroad Accident	Moderate	Low	Moderate	Moderate	Low	Moderate
Volcano	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
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Background

Hazard Mitigation Plans are required by the Federal Emergency Management Agency in order for cities and counties to be eligible for federal mitigation funding, either before or after a disaster. These programs are frequently utilized to reduce repetitive loss public infrastructure, retrofit buildings to seismic standards, flood mitigation projects, backup power retrofits and other similar projects. To maintain eligibility, our plan must be updated and approved by FEMA every 5 years. A large component of the approval process is demonstrating holistic community participation from agencies such as the Bozeman Community Development Department.

Community Wildfire Protection Plans (CWPP) have some similar goals where they identify wildfire risk and how that could be minimized, so we are taking this opportunity to combine these documents into a single plan. An important item that will come out of the CWPP portion of the revision is an update to our wildland urban interface boundary. Identification of this boundary has impacts on the land owners in terms of access to wildfire mitigation funds, how adjacent land management agencies manage their lands, and potentially how some insurers view the property.

Additional information on the plan update process is available at ReadyGallatin.com/mitigation.

Many agencies are already planning on attending, and I greatly appreciate it. This addressed message will serve as our notice of record for Bozeman Community Development Department in our planning file.

Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
plonergan@bozeman.net
ReadyGallatin.com

December 28, 2017

Daniel McDonough
Gallatin County Sheriff's Office

Dear Daniel,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Gallatin County Sheriff's Office in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Gallatin County Sheriff's Office have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

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Background

Hazard Mitigation Plans are required by the Federal Emergency Management Agency in order for cities and counties to be eligible for federal mitigation funding, either before or after a disaster. These programs are frequently utilized to reduce repetitive loss public infrastructure, retrofit buildings to seismic standards, flood mitigation projects, backup power retrofits and other similar projects. To maintain eligibility, our plan must be updated and approved by FEMA every 5 years. A large component of the approval process is demonstrating holistic community participation from agencies such as the Gallatin County Sheriff's Office.

Community Wildfire Protection Plans (CWPP) have some similar goals where they identify wildfire risk and how that could be minimized, so we are taking this opportunity to combine these documents into a single plan. An important item that will come out of the CWPP portion of the revision is an update to our wildland urban interface boundary. Identification of this boundary has impacts on the land owners in terms of access to wildfire mitigation funds, how adjacent land management agencies manage their lands, and potentially how some insurers view the property.

Additional information on the plan update process is available at ReadyGallatin.com/mitigation.

Many agencies are already planning on attending, and I greatly appreciate it. This addressed message will serve as our notice of record for Gallatin County Sheriff's Office in our planning file.

Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
plonergan@bozeman.net
ReadyGallatin.com

December 28, 2017

Greg Megaard
Big Sky Fire Department

Dear Greg,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Big Sky Fire Department in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Big Sky Fire Department have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

Table 4.74 Summary of Hazards for Gallatin County, Montana

Hazard	Probability of Major Disaster	Property Impact	Population Impact	Economic Impact	Future Development Impact	Relative Overall Risk
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Communicable Disease and Bioterrorism	Moderate	Low	High	High	Low	Moderate
Drought	Moderate	Moderate	Low	High	Moderate	Moderate
Winter Storms and Extended Cold	Moderate	Low	Moderate	Moderate	Low	Moderate
Utility Outage	Moderate	Low	High	Moderate	Low	Moderate
Severe Thunderstorms	Moderate	Moderate	Moderate	Moderate	Low	Moderate
Wind and Tornadoes	Moderate	Moderate	Moderate	Moderate	Low	Moderate
Ground Transportation Incident	Moderate	Low	Moderate	Moderate	Low	Moderate
Dam Failure	High	Moderate	Moderate	Moderate	Moderate	Moderate
Terrorism	Moderate	Moderate	Moderate	Moderate	Low	Moderate
Railroad Accident	Moderate	Low	Moderate	Moderate	Low	Moderate
Volcano	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
Urban Conflagration	Moderate	High	Moderate	High	Moderate	Moderate
Avalanche and Landslide	Moderate	Low	Moderate	Low	Low	Low
Aviation Accident	Moderate	Low	Low	Moderate	Low	Low
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Background

Hazard Mitigation Plans are required by the Federal Emergency Management Agency in order for cities and counties to be eligible for federal mitigation funding, either before or after a disaster. These programs are frequently utilized to reduce repetitive loss public infrastructure, retrofit buildings to seismic standards, flood mitigation projects, backup power retrofits and other similar projects. To maintain eligibility, our plan must be updated and approved by FEMA every 5 years. A large component of the approval process is demonstrating holistic community participation from agencies such as the Big Sky Fire Department.

Community Wildfire Protection Plans (CWPP) have some similar goals where they identify wildfire risk and how that could be minimized, so we are taking this opportunity to combine these documents into a single plan. An important item that will come out of the CWPP portion of the revision is an update to our wildland urban interface boundary. Identification of this boundary has impacts on the land owners in terms of access to wildfire mitigation funds, how adjacent land management agencies manage their lands, and potentially how some insurers view the property.

Additional information on the plan update process is available at ReadyGallatin.com/mitigation.

Many agencies are already planning on attending, and I greatly appreciate it. This addressed message will serve as our notice of record for Big Sky Fire Department in our planning file.

Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
plonergan@bozeman.net
ReadyGallatin.com

December 28, 2017

Taylor Middleton
Big Sky Resort

Dear Taylor,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Big Sky Resort in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Big Sky Resort have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

Table 4.74 Summary of Hazards for Gallatin County, Montana

Hazard	Probability of Major Disaster	Property Impact	Population Impact	Economic Impact	Future Development Impact	Relative Overall Risk
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Hazardous Materials Release	High	Moderate	High	High	Moderate	High
Flooding	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
Communicable Disease and Bioterrorism	Moderate	Low	High	High	Low	Moderate
Drought	Moderate	Moderate	Low	High	Moderate	Moderate
Winter Storms and Extended Cold	Moderate	Low	Moderate	Moderate	Low	Moderate
Utility Outage	Moderate	Low	High	Moderate	Low	Moderate
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Wind and Tornadoes	Moderate	Low	Moderate	Moderate	Low	Moderate
Ground Transportation Incident	Moderate	Low	Moderate	Moderate	Low	Moderate
Dam Failure	High	Moderate	Moderate	Moderate	Moderate	Moderate
Terrorism	Moderate	Moderate	Moderate	Moderate	Low	Moderate
Railroad Accident	Moderate	Low	Moderate	Moderate	Low	Moderate
Volcano	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
Urban Conflagration	Moderate	High	Moderate	High	Moderate	Moderate
Avalanche and Landslide	Moderate	Low	Moderate	Low	Low	Low
Aviation Accident	Moderate	Low	Low	Moderate	Low	Low
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Work sessions are currently scheduled for:

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Background

Hazard Mitigation Plans are required by the Federal Emergency Management Agency in order for cities and counties to be eligible for federal mitigation funding, either before or after a disaster. These programs are frequently utilized to reduce repetitive loss public infrastructure, retrofit buildings to seismic standards, flood mitigation projects, backup power retrofits and other similar projects. To maintain eligibility, our plan must be updated and approved by FEMA every 5 years. A large component of the approval process is demonstrating holistic community participation from agencies such as the Big Sky Resort.

Community Wildfire Protection Plans (CWPP) have some similar goals where they identify wildfire risk and how that could be minimized, so we are taking this opportunity to combine these documents into a single plan. An important item that will come out of the CWPP portion of the revision is an update to our wildland urban interface boundary. Identification of this boundary has impacts on the land owners in terms of access to wildfire mitigation funds, how adjacent land management agencies manage their lands, and potentially how some insurers view the property.

Additional information on the plan update process is available at ReadyGallatin.com/mitigation.

Many agencies are already planning on attending, and I greatly appreciate it. This addressed message will serve as our notice of record for Big Sky Resort in our planning file.

Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
plonergan@bozeman.net
ReadyGallatin.com

December 28, 2017

Justin Mitchell
Clarkston Fire Service Area

Dear Justin,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Clarkston Fire Service Area in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Clarkston Fire Service Area have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

Table 4.74 Summary of Hazards for Gallatin County, Montana

Hazard	Probability of Major Disaster	Property Impact	Population Impact	Economic Impact	Future Development Impact	Relative Overall Risk
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Earthquake	High	High	High	High	Moderate	High
Hazardous Materials Release	High	Moderate	High	High	Moderate	High
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Drought	Moderate	Moderate	Low	High	Moderate	Moderate
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Background

Hazard Mitigation Plans are required by the Federal Emergency Management Agency in order for cities and counties to be eligible for federal mitigation funding, either before or after a disaster. These programs are frequently utilized to reduce repetitive loss public infrastructure, retrofit buildings to seismic standards, flood mitigation projects, backup power retrofits and other similar projects. To maintain eligibility, our plan must be updated and approved by FEMA every 5 years. A large component of the approval process is demonstrating holistic community participation from agencies such as the Clarkston Fire Service Area.

Community Wildfire Protection Plans (CWPP) have some similar goals where they identify wildfire risk and how that could be minimized, so we are taking this opportunity to combine these documents into a single plan. An important item that will come out of the CWPP portion of the revision is an update to our wildland urban interface boundary. Identification of this boundary has impacts on the land owners in terms of access to wildfire mitigation funds, how adjacent land management agencies manage their lands, and potentially how some insurers view the property.

Additional information on the plan update process is available at ReadyGallatin.com/mitigation.

Many agencies are already planning on attending, and I greatly appreciate it. This addressed message will serve as our notice of record for Clarkston Fire Service Area in our planning file.

Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
plonergan@bozeman.net
ReadyGallatin.com

December 28, 2017

Russ Nelson
City of Belgrade

Dear Russ,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the City of Belgrade in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the City of Belgrade have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

Table 4.74 Summary of Hazards for Gallatin County, Montana

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Background

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Community Wildfire Protection Plans (CWPP) have some similar goals where they identify wildfire risk and how that could be minimized, so we are taking this opportunity to combine these documents into a single plan. An important item that will come out of the CWPP portion of the revision is an update to our wildland urban interface boundary. Identification of this boundary has impacts on the land owners in terms of access to wildfire mitigation funds, how adjacent land management agencies manage their lands, and potentially how some insurers view the property.

Additional information on the plan update process is available at ReadyGallatin.com/mitigation.

Many agencies are already planning on attending, and I greatly appreciate it. This addressed message will serve as our notice of record for City of Belgrade in our planning file.

Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
plonergan@bozeman.net
ReadyGallatin.com

December 28, 2017

Scott Newell
West Yellowstone Police Department

Dear Scott,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the West Yellowstone Police Department in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the West Yellowstone Police Department have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

Table 4.74 Summary of Hazards for Gallatin County, Montana

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Work sessions are currently scheduled for:

Date	Time	Location	Address
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		Coordination Center	Bozeman
February 7, 2018	8:30-12:00	Virtual Webinar	Click Here
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Background

Hazard Mitigation Plans are required by the Federal Emergency Management Agency in order for cities and counties to be eligible for federal mitigation funding, either before or after a disaster. These programs are frequently utilized to reduce repetitive loss public infrastructure, retrofit buildings to seismic standards, flood mitigation projects, backup power retrofits and other similar projects. To maintain eligibility, our plan must be updated and approved by FEMA every 5 years. A large component of the approval process is demonstrating holistic community participation from agencies such as the West Yellowstone Police Department.

Community Wildfire Protection Plans (CWPP) have some similar goals where they identify wildfire risk and how that could be minimized, so we are taking this opportunity to combine these documents into a single plan. An important item that will come out of the CWPP portion of the revision is an update to our wildland urban interface boundary. Identification of this boundary has impacts on the land owners in terms of access to wildfire mitigation funds, how adjacent land management agencies manage their lands, and potentially how some insurers view the property.

Additional information on the plan update process is available at ReadyGallatin.com/mitigation.

Many agencies are already planning on attending, and I greatly appreciate it. This addressed message will serve as our notice of record for West Yellowstone Police Department in our planning file.

Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
plonergan@bozeman.net
ReadyGallatin.com

December 28, 2017

Sean O'Callaghan
Gallatin County Planning Department

Dear Sean,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Gallatin County Planning Department in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Gallatin County Planning Department have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

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Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
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ReadyGallatin.com

December 28, 2017

Todd Opperman
Yellowstone National Park

Dear Todd,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Yellowstone National Park in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Yellowstone National Park have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

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Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
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December 28, 2017

Frank Parrish
 Montana State University

Dear Frank,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Montana State University in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Montana State University have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

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Many agencies are already planning on attending, and I greatly appreciate it. This addressed message will serve as our notice of record for Montana State University in our planning file.

Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
plonergan@bozeman.net
ReadyGallatin.com

December 28, 2017

George Reich
Willow Creek Fire District

Dear George,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Willow Creek Fire District in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Willow Creek Fire District have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

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Many agencies are already planning on attending, and I greatly appreciate it. This addressed message will serve as our notice of record for Willow Creek Fire District in our planning file.

Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



December 28, 2017

Jason Revisky
Hayalite Fire District

Dear Jason,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Hayalite Fire District in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Hayalite Fire District have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

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Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
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December 28, 2017

Tara Ross
Yellowstone National Park

Dear Tara,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Yellowstone National Park in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Yellowstone National Park have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

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Background

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Community Wildfire Protection Plans (CWPP) have some similar goals where they identify wildfire risk and how that could be minimized, so we are taking this opportunity to combine these documents into a single plan. An important item that will come out of the CWPP portion of the revision is an update to our wildland urban interface boundary. Identification of this boundary has impacts on the land owners in terms of access to wildfire mitigation funds, how adjacent land management agencies manage their lands, and potentially how some insurers view the property.

Additional information on the plan update process is available at ReadyGallatin.com/mitigation.

Many agencies are already planning on attending, and I greatly appreciate it. This addressed message will serve as our notice of record for Yellowstone National Park in our planning file.

Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
plonergan@bozeman.net
ReadyGallatin.com

December 28, 2017

Dan Sabolsky
Town of West Yellowstone

Dear Dan,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Town of West Yellowstone in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Town of West Yellowstone have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

Table 4.74 Summary of Hazards for Gallatin County, Montana

Hazard	Probability of Major Disaster	Property Impact	Population Impact	Economic Impact	Future Development Impact	Relative Overall Risk
Wildfire	High	High	High	Moderate	Moderate	High
Earthquake	High	High	High	High	Moderate	High
Hazardous Materials Release	High	Moderate	High	High	Moderate	High
Flooding	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
Communicable Disease and Bioterrorism	Moderate	Low	High	High	Low	Moderate
Drought	Moderate	Moderate	Low	High	Moderate	Moderate
Winter Storms and Extended Cold	Moderate	Low	Moderate	Moderate	Low	Moderate
Utility Outage	Moderate	Low	High	Moderate	Low	Moderate
Severe Thunderstorms	Moderate	Moderate	Moderate	Moderate	Low	Moderate
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Civil Unrest, and Violence	Low	Moderate	Low	Moderate	Low	Low

Work sessions are currently scheduled for:

Date	Time	Location	Address
February 6, 2018	1:00-4:30	Three Forks Ambulance Station	2 East Hickory Three Forks
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February 7, 2018	8:30-12:00	Virtual Webinar	Click Here
February 8, 2018	8:00-11:30	West Yellowstone City Hall	440 Yellowstone Ave West Yellowstone
February 8, 2018	1:30-5:00	Big Sky Water & Sewer	561 Little Coyote Big Sky
February 8, 2018	8:30-12:00	Central Valley Fire District – Training Center	205 East Main Belgrade

Background

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Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
plonergan@bozeman.net
ReadyGallatin.com

December 28, 2017

Greg Schack
Town of Manhattan

Dear Greg,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Town of Manhattan in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Town of Manhattan have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

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Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
plonergan@bozeman.net
ReadyGallatin.com

December 28, 2017

Paul Schneider
Bozeman Yellowstone Airport

Dear Paul,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Bozeman Yellowstone Airport in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Bozeman Yellowstone Airport have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

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Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
plonergan@bozeman.net
ReadyGallatin.com

December 28, 2017

Don Seifert
Gallatin County Commission

Dear Don,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Gallatin County Commission in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Gallatin County Commission have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

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Additional information on the plan update process is available at ReadyGallatin.com/mitigation.

Many agencies are already planning on attending, and I greatly appreciate it. This addressed message will serve as our notice of record for Gallatin County Commission in our planning file.

Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
plonergan@bozeman.net
ReadyGallatin.com

December 28, 2017

Joe Skinner
Gallatin County Commission

Dear Joe,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Gallatin County Commission in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Gallatin County Commission have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

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Background

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Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
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ReadyGallatin.com

December 28, 2017

Kelly Smith
City of Three Forks

Dear Kelly,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the City of Three Forks in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the City of Three Forks have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

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Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
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December 28, 2017

Susan Spanjol
American Red Cross

Dear Susan,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the American Red Cross in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the American Red Cross have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

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Terrorism	Moderate	Moderate	Moderate	Moderate	Low	Moderate
Railroad Accident	Moderate	Low	Moderate	Moderate	Low	Moderate
Volcano	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
Urban Conflagration	Moderate	High	Moderate	High	Moderate	Moderate
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Work sessions are currently scheduled for:

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Background

Hazard Mitigation Plans are required by the Federal Emergency Management Agency in order for cities and counties to be eligible for federal mitigation funding, either before or after a disaster. These programs are frequently utilized to reduce repetitive loss public infrastructure, retrofit buildings to seismic standards, flood mitigation projects, backup power retrofits and other similar projects. To maintain eligibility, our plan must be updated and approved by FEMA every 5 years. A large component of the approval process is demonstrating holistic community participation from agencies such as the American Red Cross.

Community Wildfire Protection Plans (CWPP) have some similar goals where they identify wildfire risk and how that could be minimized, so we are taking this opportunity to combine these documents into a single plan. An important item that will come out of the CWPP portion of the revision is an update to our wildland urban interface boundary. Identification of this boundary has impacts on the land owners in terms of access to wildfire mitigation funds, how adjacent land management agencies manage their lands, and potentially how some insurers view the property.

Additional information on the plan update process is available at ReadyGallatin.com/mitigation.

Many agencies are already planning on attending, and I greatly appreciate it. This addressed message will serve as our notice of record for American Red Cross in our planning file.

Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
plonergan@bozeman.net
ReadyGallatin.com

December 28, 2017

Dan Springer
Gallatin County Sheriff's Office

Dear Dan,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Gallatin County Sheriff's Office in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Gallatin County Sheriff's Office have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

Table 4.74 Summary of Hazards for Gallatin County, Montana

Hazard	Probability of Major Disaster	Property Impact	Population Impact	Economic Impact	Future Development Impact	Relative Overall Risk
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Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
plonergan@bozeman.net
ReadyGallatin.com

December 28, 2017

Steve Story
 Montana Department of Natural Resources and Conservation

Dear Steve,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Montana Department of Natural Resources and Conservation in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Montana Department of Natural Resources and Conservation have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

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Additional information on the plan update process is available at ReadyGallatin.com/mitigation.

Many agencies are already planning on attending, and I greatly appreciate it. This addressed message will serve as our notice of record for Montana Department of Natural Resources and Conservation in our planning file.

Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
plonergan@bozeman.net
ReadyGallatin.com

December 28, 2017

Matt Stubblefield
Gallatin County Sheriff's Office

Dear Matt,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Gallatin County Sheriff's Office in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Gallatin County Sheriff's Office have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

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Background

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Additional information on the plan update process is available at ReadyGallatin.com/mitigation.

Many agencies are already planning on attending, and I greatly appreciate it. This addressed message will serve as our notice of record for Gallatin County Sheriff's Office in our planning file.

Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
plonergan@bozeman.net
ReadyGallatin.com

December 28, 2017

Andrea Surratt
City of Bozeman

Dear Andrea,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the City of Bozeman in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the City of Bozeman have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

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Community Wildfire Protection Plans (CWPP) have some similar goals where they identify wildfire risk and how that could be minimized, so we are taking this opportunity to combine these documents into a single plan. An important item that will come out of the CWPP portion of the revision is an update to our wildland urban interface boundary. Identification of this boundary has impacts on the land owners in terms of access to wildfire mitigation funds, how adjacent land management agencies manage their lands, and potentially how some insurers view the property.

Additional information on the plan update process is available at ReadyGallatin.com/mitigation.

Many agencies are already planning on attending, and I greatly appreciate it. This addressed message will serve as our notice of record for City of Bozeman in our planning file.

Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
plonergan@bozeman.net
ReadyGallatin.com

December 28, 2017

Megan Syner
National Weather Service

Dear Megan,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the National Weather Service in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the National Weather Service have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

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Additional information on the plan update process is available at ReadyGallatin.com/mitigation.

Many agencies are already planning on attending, and I greatly appreciate it. This addressed message will serve as our notice of record for National Weather Service in our planning file.

Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
plonergan@bozeman.net
ReadyGallatin.com

December 28, 2017

Dustin Tetrault
Madison County

Dear Dustin,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Madison County in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Madison County have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

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Additional information on the plan update process is available at ReadyGallatin.com/mitigation.

Many agencies are already planning on attending, and I greatly appreciate it. This addressed message will serve as our notice of record for Madison County in our planning file.

Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
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December 28, 2017

John Thompson
Bureau of Land Management

Dear John,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Bureau of Land Management in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Bureau of Land Management have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

Table 4.74 Summary of Hazards for Gallatin County, Montana

Hazard	Probability of Major Disaster	Property Impact	Population Impact	Economic Impact	Future Development Impact	Relative Overall Risk
Wildfire	High	High	High	Moderate	Moderate	High
Earthquake	High	High	High	High	Moderate	High
Hazardous Materials Release	High	Moderate	High	High	Moderate	High
Flooding	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
Communicable Disease and Bioterrorism	Moderate	Low	High	High	Low	Moderate
Drought	Moderate	Moderate	Low	High	Moderate	Moderate
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Utility Outage	Moderate	Low	High	Moderate	Low	Moderate
Severe Thunderstorms Wind and Tornadoes	Moderate	Moderate	Moderate	Moderate	Low	Moderate
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Railroad Accident	Moderate	Low	Moderate	Moderate	Low	Moderate
Volcano	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
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Aviation Accident	Moderate	Low	Low	Moderate	Low	Low
Civil Unrest, and Violence	Low	Moderate	Low	Moderate	Low	Low

Work sessions are currently scheduled for:

Date	Time	Location	Address
February 6, 2018	1:00-4:30	Three Forks Ambulance Station	2 East Hickory Three Forks
February 7, 2018	8:30-12:00	Gallatin County Coordination Center	219 East Tamarack Bozeman

February 7, 2018	8:30-12:00	Virtual Webinar	Click Here
February 8, 2018	8:00-11:30	West Yellowstone City Hall	440 Yellowstone Ave West Yellowstone
February 8, 2018	1:30-5:00	Big Sky Water & Sewer	561 Little Coyote Big Sky
February 8, 2018	8:30-12:00	Central Valley Fire District – Training Center	205 East Main Belgrade

Background

Hazard Mitigation Plans are required by the Federal Emergency Management Agency in order for cities and counties to be eligible for federal mitigation funding, either before or after a disaster. These programs are frequently utilized to reduce repetitive loss public infrastructure, retrofit buildings to seismic standards, flood mitigation projects, backup power retrofits and other similar projects. To maintain eligibility, our plan must be updated and approved by FEMA every 5 years. A large component of the approval process is demonstrating holistic community participation from agencies such as the Bureau of Land Management.

Community Wildfire Protection Plans (CWPP) have some similar goals where they identify wildfire risk and how that could be minimized, so we are taking this opportunity to combine these documents into a single plan. An important item that will come out of the CWPP portion of the revision is an update to our wildland urban interface boundary. Identification of this boundary has impacts on the land owners in terms of access to wildfire mitigation funds, how adjacent land management agencies manage their lands, and potentially how some insurers view the property.

Additional information on the plan update process is available at ReadyGallatin.com/mitigation.

Many agencies are already planning on attending, and I greatly appreciate it. This addressed message will serve as our notice of record for Bureau of Land Management in our planning file.

Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
plonergan@bozeman.net
ReadyGallatin.com

December 28, 2017

Samantha Tribble
Three Forks Ambulance

Dear Samantha,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Three Forks Ambulance in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Three Forks Ambulance have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

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Additional information on the plan update process is available at ReadyGallatin.com/mitigation.

Many agencies are already planning on attending, and I greatly appreciate it. This addressed message will serve as our notice of record for Three Forks Ambulance in our planning file.

Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
plonergan@bozeman.net
ReadyGallatin.com

December 28, 2017

Hayley Tuggle
 Montana State University

Dear Hayley,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Montana State University in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Montana State University have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

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Background

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Additional information on the plan update process is available at ReadyGallatin.com/mitigation.

Many agencies are already planning on attending, and I greatly appreciate it. This addressed message will serve as our notice of record for Montana State University in our planning file.

Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
plonergan@bozeman.net
ReadyGallatin.com

December 28, 2017

Crystal Turner
City of Three Forks

Dear Crystal,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the City of Three Forks in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the City of Three Forks have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

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Background

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Additional information on the plan update process is available at ReadyGallatin.com/mitigation.

Many agencies are already planning on attending, and I greatly appreciate it. This addressed message will serve as our notice of record for City of Three Forks in our planning file.

Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
plonergan@bozeman.net
ReadyGallatin.com

December 28, 2017

Mike Ulmen
Manhattan Fire District

Dear Mike,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Manhattan Fire District in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Manhattan Fire District have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

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Background

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Community Wildfire Protection Plans (CWPP) have some similar goals where they identify wildfire risk and how that could be minimized, so we are taking this opportunity to combine these documents into a single plan. An important item that will come out of the CWPP portion of the revision is an update to our wildland urban interface boundary. Identification of this boundary has impacts on the land owners in terms of access to wildfire mitigation funds, how adjacent land management agencies manage their lands, and potentially how some insurers view the property.

Additional information on the plan update process is available at ReadyGallatin.com/mitigation.

Many agencies are already planning on attending, and I greatly appreciate it. This addressed message will serve as our notice of record for Manhattan Fire District in our planning file.

Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
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ReadyGallatin.com

December 28, 2017

Mike Unruh
Big Sky Resort

Dear Mike,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Big Sky Resort in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Big Sky Resort have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

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Additional information on the plan update process is available at ReadyGallatin.com/mitigation.

Many agencies are already planning on attending, and I greatly appreciate it. This addressed message will serve as our notice of record for Big Sky Resort in our planning file.

Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
plonergan@bozeman.net
ReadyGallatin.com

December 28, 2017

Nadene Wadsworth
 Montana Disaster and Emergency Services

Dear Nadene,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Montana Disaster and Emergency Services in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Montana Disaster and Emergency Services have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

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Background

Hazard Mitigation Plans are required by the Federal Emergency Management Agency in order for cities and counties to be eligible for federal mitigation funding, either before or after a disaster. These programs are frequently utilized to reduce repetitive loss public infrastructure, retrofit buildings to seismic standards, flood mitigation projects, backup power retrofits and other similar projects. To maintain eligibility, our plan must be updated and approved by FEMA every 5 years. A large component of the approval process is demonstrating holistic community participation from agencies such as the Montana Disaster and Emergency Services.

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Many agencies are already planning on attending, and I greatly appreciate it. This addressed message will serve as our notice of record for Montana Disaster and Emergency Services in our planning file.

Please contact me at anytime with any questions you may have. I can be reached at (406) 582-2395 or plonergan@bozeman.net.

Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
plonergan@bozeman.net
ReadyGallatin.com

December 28, 2017

Jake Wagner
Gallatin County Sheriff's Office

Dear Jake,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Gallatin County Sheriff's Office in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Gallatin County Sheriff's Office have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

Table 4.74 Summary of Hazards for Gallatin County, Montana

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Earthquake	High	High	High	High	Moderate	High
Hazardous Materials Release	High	Moderate	High	High	Moderate	High
Flooding	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
Communicable Disease and Bioterrorism	Moderate	Low	High	High	Low	Moderate
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Work sessions are currently scheduled for:

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Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
plonergan@bozeman.net
ReadyGallatin.com

December 28, 2017

Josh Waldo
Bozeman Fire Department

Dear Josh,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Bozeman Fire Department in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Bozeman Fire Department have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

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Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
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December 28, 2017

Steve White
Gallatin County Commission

Dear Steve,

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Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
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ReadyGallatin.com

December 28, 2017

Mark Wilfore
Montana Highway Patrol

Dear Mark,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Montana Highway Patrol in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Montana Highway Patrol have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

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Sincerely,



Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
(406) 582-2395
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December 28, 2017

Craig Woolard
Bozeman Public Works Department

Dear Craig,

As you may be aware Gallatin County is in the process of updating the community's Hazard Mitigation and Community Wildfire Protection Plans. Both of these documents require participation from organizations such as the Bozeman Public Works Department in order to meet the recognized standards. We have scheduled a series of work sessions the week of February 5, 2018 try and accommodate schedules the best we can. At the very least I ask that the Bozeman Public Works Department have a representative participate in one meeting, however there may be value in participating in several to interact with different organizations in adjacent areas. The outcome from these work sessions will produce a variety of emergency planning products such as identified and ranked hazards, ways we can mitigate these hazards and identification of an updated wildland urban interface boundary. All of these come together to help guide our emergency management activities across Gallatin County in the coming years.

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Patrick Lonergan
Director

Gallatin County Emergency Management
34 North Rouse
Bozeman, MT 59715
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APPENDIX C

MEETING ATTENDANCE RECORDS



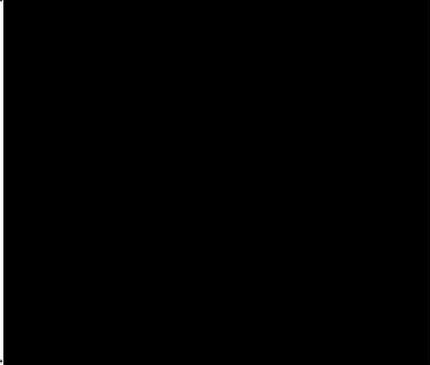
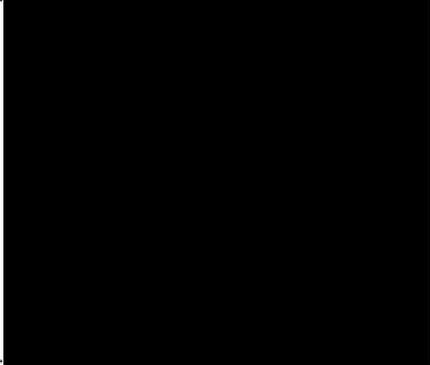
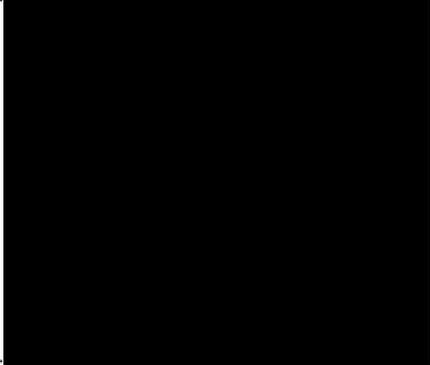
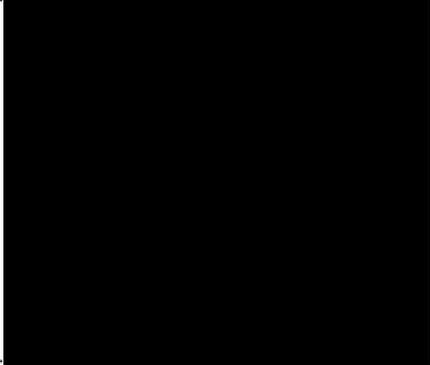
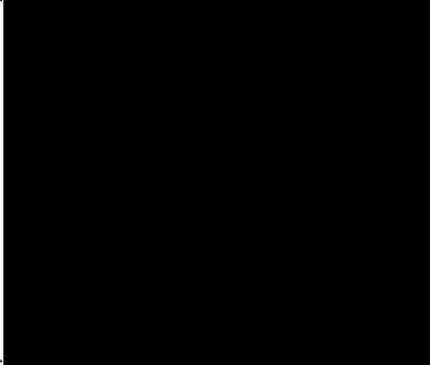
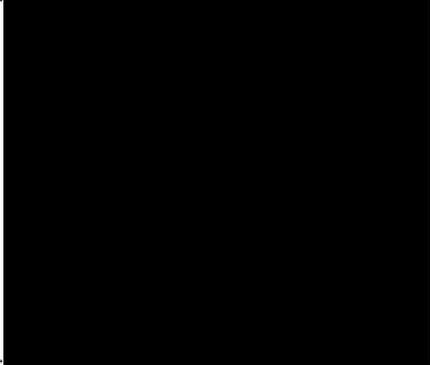
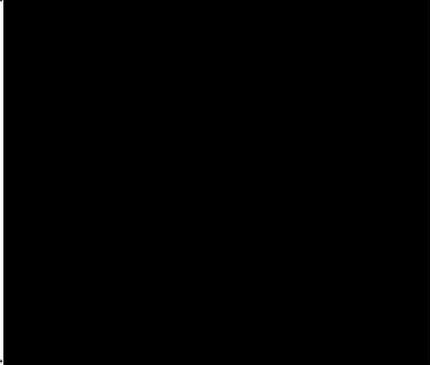
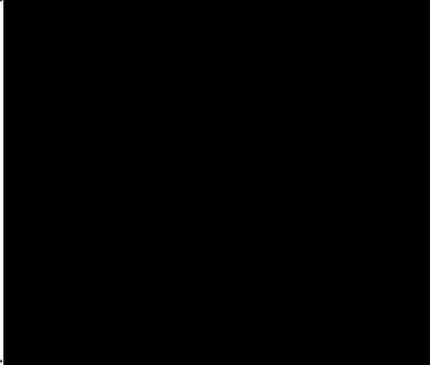
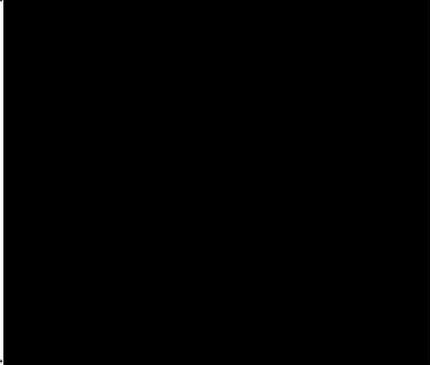
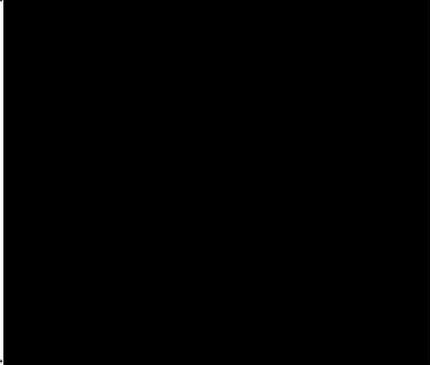
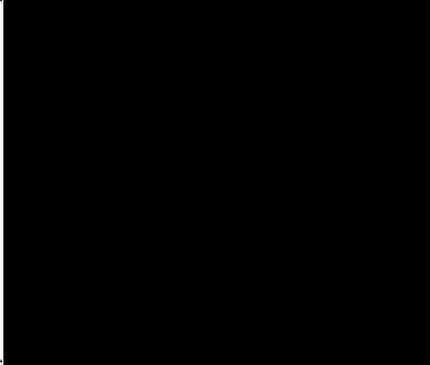
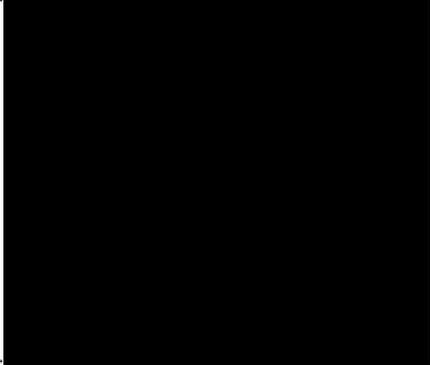
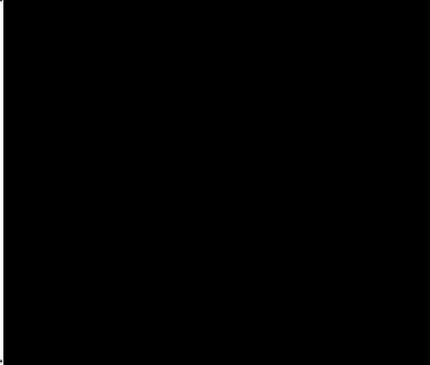
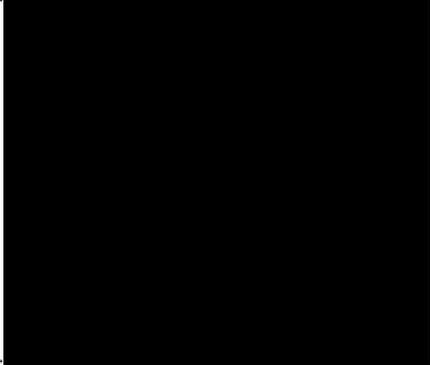
Gallatin County Hazard Mitigation Meeting
Sign-In Sheet

West Yellowstone - Thursday, Oct. 12, 2017 9:30 AM - 10:00 A

Name	Title	Organization	Email
David Sabolsky	Town Manager	Town of WY	
Jason Brey	District Ranger	U.S. F.S.	
Todd Opperman	DEPUTY FMD	YELLOWSTONE N.P.	
Shane Grube	Fire Chief	Webgen Basin Fire Dist	
James Jessor	Assst. Chief	HEGGEN BASIN FIRE	
Patrick Lorenzen	Emergency Mgr	Conf	
Scott Newell	Chief of Police	Town of West Yellowstone	
MIKE ROTAL	PROTEC MANAGER	RESPEC	
LIBBY ELWOOD	ENGINEER	RESPEC	

Gallatin County Hazard Mitigation Meeting
Sign-In Sheet

Big Sky - Thursday, Oct. 12, 2017 1:30 PM - 2:00 PM

Name	Title	Organization	Email
MIKE ROTAR	PROJECT MANAGER, RESPEC	RESPEC	
Jessianne Wright	reporter	Explore Big Sky	
LIBBY ELWOOD	ENGINEER	RESPEC	
Patrick Lowers	Director	GCFM	
SETH BARKER	CAPTAIN	BIG SKY FIRE	
			
			
			
			
			
			
			
			
			

HMP UPDATE KICKOFF MTG.

OCT. 12, 2017

4:00 PM

GALLATIN GATEWAY

FIRE HALL

NAME ORGANIZATION / JURISDICTION EMAIL

MIKE ROTAR RESPEC mike.rotar@respec.com

Patrick Lonergan COCEM

Note: This meeting did not occur, as no stakeholders or members of the public attended.

HMP UPDATE AMB
KICKOFF MTG.

OCT. 17, 2017 @ 9:00 AM
THREE FIRKS, MT
FIRE HALL

<u>NAME</u>	<u>ORGANIZATION/JURISDICTION</u>	<u>E-MAIL</u>
Patrizia Longo	GCFCM Chief, Emergency Management	
Keenya Reed	WCRFD Fire Chief	
Keith Anne	TFFD Fire Chief	
MIKE ROTAR	RESPEC Contractor	mike.rotar@respec.com

GALLATIN CC. HMP UPDATE
KICKOFF MTA.

OCT. 17, 2017 @ 11:00AM

GALLATIN COUNS. DIST.
MANHATTAN

<u>NAME</u>	<u>ORGANIZATION/JURISDICTION</u>
Contractor, MIKE ROYAL Clerk/Treasurer, Town of Manhattan	RESPEC Town of Manhattan
Chief, Emergency Management	Patrick Longren GCEM

E-MAIL



HMP UPDATE MTG.
KICKOFF MTG.

OCT. 17, 2017 @ 2:00PM

BELGRADE, MT
CVFD - TRAINING CENTER

NAME

ORGANIZATION / JURISDICTION

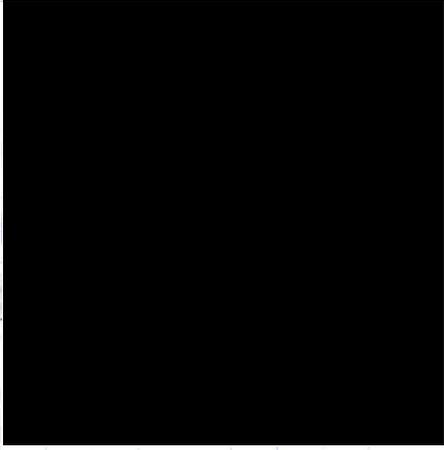
E-MAIL

Fire Dept. Chief R. Lindahl CVFD

County Planning Director Sean O'Leary Bulletin County

Chief, Emergency Management Patrick Longan CCER

Contractor MINE REPAIR RESPEC



Gallatin County Hazard Mitigation Meeting
Sign-In Sheet

Bozeman - Tuesday, Oct. 24, 2017 7:00 PM

Name	Title	Organization
Don Helmbrecht	Fire Analyst	USFS
Jessica Haas	Fire Ecologist	Rocky Mt. Research
Todd Erdody	Fire Ecologist	USFS - Custer Gallatin
Patty Kalatay	Emerg Prep. Coord.	GCCTID
Libby Ellwood	ENGINEER	RESPEC
Patrick Longenecker	Director	GCCTA
Ryan Brickman	Director	MSU
Hayley Tuggle	EM MSU	MSU

Bozeman 10/24/2017 continued

Name	Title	Organization	Email
Matthew Henry	Supt. of Schools	Gallatin County	[REDACTED]
Keri Strasheim	ARC DAT Co-Chair	American Red Cross	[REDACTED]
Chris Scott	Planner	Gallatin County	[REDACTED]
STEVE CRAWFORD	POLICE CHIEF	CITY OF BOZEMAN	[REDACTED]
			[REDACTED]



Gallatin County All Hazards All Discipline Group

Date: 10/26/17 Start Time: 1130 End Time: 1700

Name	Agency
BOB FRY	MT DFS - District Field Officer
Greg Megawad	Big Sky Fire - Acting Fire Chief
Jeremy Kopp	GCSD - Captain
Becky Babcock	GCCHD - Pub. Health Emerg. Prep. Coordinator
Dow Wilson	GC SAR - HAMS: Search & Rescue Volunteers
Megan Synn	NWS Great Falls - Weather Service Manager
Alex Peters	NWS Great Falls - Weather Service Forecaster
Koa Lindroth	CVFD - Fire Chief
BRYAN CONNELLEY	GALCo. - Emerg. Mgmt. Part-time
Swann Spangol	ARC - Community Volunteer
MIKE MALTAVERNE	Boreman Fire - Deputy Fire Chief
Hayley Tuggle	MSU - Emergency Manager
Sean O'Connell	Bullain County - Plain Admin. Planning Director
Jim Veltkamp	Boreman Police - Deputy Police Chief
Rich McLone	" - Deputy Police Chief
Christina Powell	HC&H - Help Center Director

GALLATIN COUNTY HAZARD MITIGATION PLAN PROJECT
SIGN IN SHEET

DATE: 02/06/2018 LOCATION: THREE FORKS, MT

Name: (Please Print) Organization:	Affiliation or Title: Federally Salaried? (Yes or No)	Miles Traveled Round Trip to Attend Meeting	E-mail Address: Phone No.
TOWNSHIP OF MARSHALLTOWN	Public Works DEPT.	15	
JEFF MCNULTY	Circle One: Yes <input type="radio"/> No <input checked="" type="radio"/>		
Keith Ayne	Chief	2	
Three Forks Fire Dept	Circle One: Yes <input type="radio"/> No <input checked="" type="radio"/>		
Dan McLaughlin	Circle One: Yes <input type="radio"/> No <input checked="" type="radio"/>		
Gallatin S.O.	Circle One: Yes <input type="radio"/> No <input checked="" type="radio"/>		
Mary Hendrix	Circle One: Yes <input type="radio"/> No <input checked="" type="radio"/>		
Gallatin Conservation Dist	Circle One: Yes <input type="radio"/> No <input checked="" type="radio"/>		
Christopher Meloy	Circle One: Yes <input type="radio"/> No <input checked="" type="radio"/>	15	
INRC	Circle One: Yes <input type="radio"/> No <input checked="" type="radio"/>		
Bozeman Lead Manager	Circle One: Yes <input type="radio"/> No <input checked="" type="radio"/>	30	
DIVRC	Circle One: Yes <input type="radio"/> No <input checked="" type="radio"/>		
Gladys Andrew	Circle One: Yes <input type="radio"/> No <input checked="" type="radio"/>	30	
Liz G. Ferrara	Circle One: Yes <input type="radio"/> No <input checked="" type="radio"/>		
BROADWATER CO. SHERIFF	Sheriff		
WINN M. WEEHAN	Circle One: Yes <input type="radio"/> No <input checked="" type="radio"/>	30	
Broadwater Co. Sheriff	Under Sheriff		
Branden Harris	Circle One: Yes <input type="radio"/> No <input checked="" type="radio"/>	30	
BROADWATER CO. DES	DES Coordinator		
MIKE KOENKE	Circle One: Yes <input type="radio"/> No <input checked="" type="radio"/>	20	
Patricia Lowery	Circle One: Yes <input type="radio"/> No <input checked="" type="radio"/>		
Gallatin Cond	Circle One: Yes <input type="radio"/> No <input checked="" type="radio"/>	30	

Meeting Start Time:

Meeting End Time:

GALLATIN COUNTY HAZARD MITIGATION PLAN PROJECT
SIGN IN SHEET

DATE: 02/06/2018 LOCATION: THREE FORKS, MT

Name: (Please Print) Organization:	Affiliation or Title: Federally Salaried? (Yes or No)	Miles Traveled Round Trip to Attend Meeting	E-mail Address:
Ed Shindell Broadwater Co Rural Fire	Fire Chief Circle One: Yes <input type="radio"/> No <input checked="" type="radio"/>	62	[REDACTED]
Charles Locke American Medical Response	Admin Supervisor Circle One: Yes <input type="radio"/> No <input checked="" type="radio"/>	600	[REDACTED]
George Rausch W.A. RFD	Fire Chief Circle One: Yes <input type="radio"/> No <input checked="" type="radio"/>	10	[REDACTED]
Audrey Wimer MVFD	CAPTAIN/CLERK Circle One: Yes <input type="radio"/> No <input checked="" type="radio"/>	36	[REDACTED]
Dennis HENGEL Manhattan Police	Circle One: Yes <input type="radio"/> No <input checked="" type="radio"/>	36	[REDACTED]
Jessica Dehmetke Three Rivers medical Clinic	Circle One: Yes <input type="radio"/> No <input checked="" type="radio"/>	21	[REDACTED]
Penny Nelson 3 Forks City Council	Circle One: Yes <input type="radio"/> No <input checked="" type="radio"/>	1	[REDACTED]
Steve Gonzalez Manhattan Town Council	Circle One: Yes <input type="radio"/> No <input checked="" type="radio"/>	52	[REDACTED]
Steven Rusk Public Works - Town of Manhattan	Circle One: Yes <input type="radio"/> No <input checked="" type="radio"/>	15	[REDACTED]
Steven Hamilton Manhattan City of Three Forks	Circle One: Yes <input type="radio"/> No <input checked="" type="radio"/>	1	[REDACTED]
	Circle One: Yes <input type="radio"/> No <input type="radio"/>		

Meeting Start Time: Meeting End Time:

**GALLATIN COUNTY HAZARD MITIGATION PLAN PROJECT
SIGN IN SHEET**

DATE: 02/07/2018 LOCATION: BOZEMAN, MT

Name: (Please Print) Organization:	Affiliation or Title: Federally Salaried? (Yes or No)	Miles Traveled Round Trip to Attend Meeting	E-mail Address:
Hayley Tuggle Montana State University	Emergency Management Coordinator Circle One: Yes <input checked="" type="radio"/> No		
Madison Boone Institute on Ecosystems, MSU	Circle One: Yes <input checked="" type="radio"/> No		
DOMINIQUE WOODHAM MSU Extension Service	Natural Resources Extension Agent Circle One: Yes <input checked="" type="radio"/> No	< 1 mi	
Todd Erbeley USFS	Fire Ecologist Circle One: Yes <input checked="" type="radio"/> No	2 miles	
Jessica Haas USFS RMRS	Ecologist Circle One: Yes <input checked="" type="radio"/> No	4	
Paul McKinley Mont. Dept. Transportation	Circle One: Yes <input checked="" type="radio"/> No	8	
Mary Martin HOPE AARL	Circle One: Yes <input checked="" type="radio"/> No	~7	
Susan Spaniol Comm. Member	Circle One: Yes <input checked="" type="radio"/> No	18	
Cores Lowellen US Forest Service	District Ranger Circle One: Yes <input checked="" type="radio"/> No	~5	
Fred Jones US Forest Service	Fire Mgmt Officer Circle One: Yes <input checked="" type="radio"/> No	~5	
Eric Campbell City of Bozeman WTP	Circle One: Yes <input checked="" type="radio"/> No	6	

Meeting Start Time: Meeting End Time:

GALLATIN COUNTY HAZARD MITIGATION PLAN PROJECT
SIGN IN SHEET

DATE: 02/07/2018 LOCATION: BOZEMAN, MT

Name: (Please Print) Organization:	Affiliation or Title: Federally Salaried? (Yes or No)	Miles Traveled Round Trip to Attend Meeting	E-mail Address:
Beth Kalakay Gallatin County Health Dept	Emergency Preparedness Coordinator Circle One: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
STEVEN W. DONER MONTANA STATE UNIVERSITY POLICE	Captain Circle One: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
BOB FRY MT DES	Circle One: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
Patrizia Loney GLEN	Circle One: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	0	
RANDY STEPHENS MONTANA STATE UNIV	Circle One: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
Natalie Meyer City of Bozeman	Sustainability Mgr Circle One: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
Charles Leike AMR	Circle One: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
MIKE MALTAVERNE BOZEMAN FIRE DEPT	Circle One: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
STENE CRANFORD BOZEMAN POLICE	Circle One: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
CRAIG WOOLARD BOZEMAN PUBLICWORKS	Circle One: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
Susan O'Lalley County Floodplain Admin	Circle One: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		

Meeting Start Time: Meeting End Time:

**GALLATIN COUNTY HAZARD MITIGATION PLAN PROJECT
SIGN IN SHEET**

DATE: 02/07/2018 LOCATION: BOZEMAN, MT

Name: (Please Print) Organization:	Affiliation or Title: Federally Salaried? (Yes or No)	Miles Traveled Round Trip to Attend Meeting	E-mail Address:
Jim Dyer GALLATIN COUNTY	Circle One: Yes <input type="radio"/> No <input checked="" type="radio"/>	1	[REDACTED]
Pory Klumb Bozeman PD	Circle One: Yes <input type="radio"/> No <input checked="" type="radio"/>		[REDACTED]
Kerr: Strasheim MT DWRC / ARC DAT	Circle One: Yes <input type="radio"/> No <input checked="" type="radio"/>		[REDACTED]
Tyler Martindale NSDA-NRES	Area Engineer Circle One: Yes <input checked="" type="radio"/> No <input type="radio"/>		[REDACTED]
Dean Spitznagel GCSO	Circle One: Yes <input type="radio"/> No <input checked="" type="radio"/>		[REDACTED]
	Circle One: Yes <input type="radio"/> No <input type="radio"/>		[REDACTED]
	Circle One: Yes <input type="radio"/> No <input type="radio"/>		[REDACTED]
	Circle One: Yes <input type="radio"/> No <input type="radio"/>		[REDACTED]
	Circle One: Yes <input type="radio"/> No <input type="radio"/>		[REDACTED]
	Circle One: Yes <input type="radio"/> No <input type="radio"/>		[REDACTED]
	Circle One: Yes <input type="radio"/> No <input type="radio"/>		[REDACTED]
	Circle One: Yes <input type="radio"/> No <input type="radio"/>		[REDACTED]
	Circle One: Yes <input type="radio"/> No <input type="radio"/>		[REDACTED]
	Circle One: Yes <input type="radio"/> No <input type="radio"/>		[REDACTED]

Meeting Start Time: Meeting End Time:

GALLATIN COUNTY HAZARD MITIGATION PLAN PROJECT
SIGN IN SHEET

DATE: 02/08/2018

LOCATION: BIG SKY, MT

Name: (Please Print) Organization:	Affiliation or Title: Federally Salaried? (Yes or No)	Miles Traveled Round Trip to Attend Meeting	E-mail Address: Phone No.
Mike Church Big Sky Resort	Yes <input checked="" type="radio"/> No <input type="radio"/> Circle One: Yes <input checked="" type="radio"/> No <input type="radio"/>	20 +/-	
Jessamine Wright Expire Big Sky newspaper	Circle One: Yes <input type="radio"/> No <input checked="" type="radio"/>		
Jason Manley Yellowstone Club Fire	Circle One: Yes <input type="radio"/> No <input checked="" type="radio"/>	7	
Michelle Secant? B.S. Forest Tax District	Circle One: Yes <input type="radio"/> No <input checked="" type="radio"/>	1	
Kristin Dravin Big Sky Forest Tax District	Circle One: Yes <input type="radio"/> No <input checked="" type="radio"/>	3	
Dustin Tebrault Madison County DES	Circle One: Yes <input checked="" type="radio"/> No <input type="radio"/>		
Justin Measrod NRCS	Circle One: Yes <input checked="" type="radio"/> No <input type="radio"/>	180	
Derrick Lemmon BCEN	Circle One: Yes <input checked="" type="radio"/> No <input type="radio"/>	60	
Cory Lowellen US Forest Service	District Manager Circle One: Yes <input checked="" type="radio"/> No <input type="radio"/>	600	
Dean Shed Big Sky Fire Dept	Circle One: Yes <input type="radio"/> No <input checked="" type="radio"/>	0	
Stephan Prust BSFD	Circle One: Yes <input checked="" type="radio"/> No <input type="radio"/>	0	

Meeting Start Time:

Meeting End Time:

GALLATIN COUNTY HAZARD MITIGATION PLAN PROJECT
SIGN IN SHEET

DATE: 02/08/2018

LOCATION: BIG SKY, MT

Name: (Please Print) Organization:	Affiliation or Title: Federally Salaried? (Yes or No)	Miles Traveled Round Trip to Attend Meeting	E-mail Address:
<i>Craig Cramer II</i>	Circle One: Yes <input checked="" type="radio"/> No	<i>110</i>	[REDACTED]
<i>DNR, State of MT</i>	<i>BATTALION CHIEF</i>	<i>0</i>	[REDACTED]
<i>SIETH BAKER</i>	Circle One: Yes <input checked="" type="radio"/> No		[REDACTED]
<i>BIG SKY FIRE DEPT</i>	<i>ADULT FIRE CHIEF</i>	<i>61</i>	[REDACTED]
<i>Greg Megard</i>	Circle One: Yes <input checked="" type="radio"/> No		[REDACTED]
<i>Big Sky Fire Dept</i>	<i>FOUR CHIEF</i>	<i>0</i>	[REDACTED]
<i>William Forbush</i>	Circle One: Yes <input checked="" type="radio"/> No		[REDACTED]
<i>Big Sky Fire Dept</i>			[REDACTED]
<i>Brandon Kelly</i>	Circle One: Yes <input checked="" type="radio"/> No		[REDACTED]
<i>BLSO</i>			[REDACTED]
<i>Marianne Braumberger</i>	Circle One: Yes <input checked="" type="radio"/> No	<i>110</i>	[REDACTED]
	Circle One: Yes No		[REDACTED]
	Circle One: Yes No		[REDACTED]
	Circle One: Yes No		[REDACTED]
	Circle One: Yes No		[REDACTED]
	Circle One: Yes No		[REDACTED]
	Circle One: Yes No		[REDACTED]
	Circle One: Yes No		[REDACTED]

Meeting Start Time:

Meeting End Time:

GALLATIN COUNTY HAZARD MITIGATION PLAN PROJECT
SIGN IN SHEET

DATE: 02/09/2018

LOCATION: BELGRADE, MT

Name: (Please Print) Organization:	Affiliation or Title: Federally Salaried? (Yes or No)	Miles Traveled Round Trip to Attend Meeting	E-mail Address: Phone No.
Chris Scott Gallatin Co. Planning	Planner / Assistant Flooding Advisor Circle One: Yes <input checked="" type="radio"/> No <input type="radio"/>	20 miles	[REDACTED]
LINDA HAYCOCK XXXXXXXXXXXX	Red Cross Circle One: Yes <input type="radio"/> No <input checked="" type="radio"/>	18 miles	[REDACTED]
Cheryl Doughty Krummholz	Child Connections Circle One: Yes <input type="radio"/> No <input checked="" type="radio"/>	10 miles	[REDACTED]
Jason Karp City of Belgrade Planning	Circle One: Yes <input type="radio"/> No <input checked="" type="radio"/>	about 2 blocks (walk)	[REDACTED]
Christy Baker Mackay NBCS	District Resource Conservationist Circle One: Yes <input checked="" type="radio"/> No <input type="radio"/>	10 miles	[REDACTED]
Carey Lewellen U.S. Forest Service	District Ranger Circle One: Yes <input type="radio"/> No <input checked="" type="radio"/>	10 miles	[REDACTED]
Ron Lindroth CVFD	Fire Chief Circle One: Yes <input checked="" type="radio"/> No <input type="radio"/>	24	[REDACTED]
	Circle One: Yes <input type="radio"/> No <input type="radio"/>		[REDACTED]
	Circle One: Yes <input type="radio"/> No <input type="radio"/>		[REDACTED]
	Circle One: Yes <input type="radio"/> No <input type="radio"/>		[REDACTED]
	Circle One: Yes <input type="radio"/> No <input type="radio"/>		[REDACTED]
	Circle One: Yes <input type="radio"/> No <input type="radio"/>		[REDACTED]

Meeting Start Time:

Meeting End Time:



Gallatin County All Hazards All Discipline Group - CWRP Mtg

Date: 6/27/18 Start Time: 1500 End Time: 1630

Name	Agency
BOB FRY	MT DES - District Field Officer
Bob Culbreth	Bozeman R.D. Custer Gallatin National Forest - Fire Mgmt Office
Miko GAGAN	USDA Forest Service - Fire Staff Officer
Steve Smith	USFS Bozeman R.D. - Asst. Fire Mgmt Officer
Sean O'Callaghan	Gallatin County Planning + Community Development - County Planner
Chris Saunders	City of Bozeman, Community Development - Manager
Gracie Campbell	MT-DNR - Unit Manager
MIKE ROTH	RESPEC - Contractor
Erin Megeard	Big Sky Fire Dept. - Acting Fire Chief
Susan Spanjol	Community Member - Community Volunteer
Natalie Meyer	City of Bozeman - Sustainability Program Manager
Todd Erdady	USFS - Custer Gallatin NF - Fire Planner
Linda Raccicot	Red Cross - Disaster Action Team Volunteer
Bay Stephens	Explore Big Sky - Reporter
Hayley Tuggle	MSU - Emergency Manager
Corey Lewellen	USFS, Bozeman Ranger District - District Ranger

**GALLATIN COUNTY
HAZARD MITIGATION & COMMUNITY WILDFIRE PROTECTION PLANS - 2019 UPDATE
SIGN-IN SHEET**

DATE: JANUARY 22, 2019 - 1:00 P.M. LOCATION: GCEM COORDINATION CENTER

Name: (Please Print) Organization:	Affiliation or Title: Federally Salaried? (Yes or No)	Miles Traveled Round Trip to Attend Meeting	E-mail Address:
Town of Manhattan Steve Kurk	City Service Worker Circle One: Yes No	30	
Frank County Greg Chiseman	Office of Emergency Management Circle One: Yes No	25	
Gallatin Coalition P-Fire Concepts BOB FRY	Circle One: Yes No		
MT DES	Circle One: Yes No		
DOMINIQUE WOODMAN MSU EXTENSION	Circle One: Yes No		
JIM TONG COUNTY ADMIN	Circle One: Yes No		
Steve O'Callaghan County Planning	Circle One: Yes No		
Kelly Fohl Headwaters Economics	Circle One: Yes No		
Greg Campbell DNRC	Circle One: Yes No		
Ron Leadcraft Central Valley Fire District	Fire Chief Circle One: Yes No		
Pat McLaughlin MT Highway Patrol	Sergeant Circle One: Yes No	20	

Meeting Start Time: 1:00 PM Meeting End Time: 90
 FALL FARMAT FIRE CHIEF NO
 BIG SKY FIRE

List of Stakeholders for the 2018 Montana State University PDM Plan Update
 (includes list of meeting attendees at April 25, 2018 hazard identification, analysis, and risk assessment meeting)

Hazard Mitigation Plan Update 2018

25 April 2018

Hazard Identification, Analysis, and Risk Assessment

Name	Position/ Agency
RANDY STEPHENS	UNIV. ARCHITECT / MSU
Megan Sterl	Eng / Utilities MSU.
SKIP HOUGLAND	MSU - SRM
PAUL LAMBETH	MSU - UIT
Chris Caruso	MSU - FS
Madi Kraff	CPDG Planner
LIBBY ELLWOOD	RESPEC - CONSULTANT
Ben Wheat	Lab Manager - ABB
B Kalala	GCCAD
Matt Cirio	Dir. OF STUDENTS
Frank Spott	MSU
Justin van Almelb	UIT
BRIAN O'CONNOR	AIF, PROCUREMENT
Kirk Lubick	Director, OTC
Michael Becker	UComms News Director
Reed Huffman	Culinary Services
DAN DAVIES	ATHLETICS
Ashlee Heavrin	MSU PD
Josh Waldo	Bozeman Fire
PAT MCCARTHY	MHP
Jeff Bondy	Residence L.G. Housing
Tom Stump	Aux Services
MIKE ROTAR	RESPEC



APPENDIX D

SUMMARY OF PLAN CHANGES



2018 PLAN CHANGES

The 2012 Gallatin County HMP was updated to reflect current conditions, hazards, and the prioritization of hazards to inform an accurate risk assessment. Data, maps, and figures were updated based on recent, available information, and hazards were discretized geographically to reflect varying vulnerability throughout the county. Changes were made to the document format to improve plan organization and readability. Specific plan changes are outlined in the sections below.

Executive Summary

- / An Executive Summary was added.
- / A summary table of the hazards identified and prioritized (low, moderate, high) during the update process is included.

Section 1.0 – Introduction

- / The Introduction section was updated using the introduction from the previous plan (Section 2.0, 2012 HMP) as a basis.
 - / Sections outlining the purpose, authority, background, and scope of the plan were added.
 - / Maps and data were updated.

Section 2.0 – Planning Process and Methodologies

- / The Planning Process section (Section 3.0, 2012 HMP), and a portion of the Risk Assessment section (Section 4.0, 2012 HMP), were combined and updated to create Section 2.0 of the HMP update.
- / Information was added to describe the 2018 planning process, including descriptions of the planning team and stakeholders, community changes including delineation of five community districts across the county, a brief summary of plan changes, jurisdiction participation and schedule of meetings, public participation, incorporation of existing information, and plan adoption.
 - / Information regarding risk assessment methodologies used in hazard profiles was added.
- / A section was added to document existing local plans, studies, and reports which were incorporated into the plan.

Chapter 3.0 – Risk Assessment and Community Inventory

- / The Risk Assessment section (Section 4.0, 2012 HMP) in the previous plan was used as a basis to create Section 3.0.
 - / The critical facilities list was updated through internet research and stakeholder input.
 - / The critical facilities GIS and mapping was updated.
 - / Information was added and updated regarding critical infrastructure.
 - / Updated HAZUS information was incorporated.
 - / The Future Development section was updated to include updated plans and estimates.

Chapter 4.0 – Risk Assessment/Hazard Profiles

- / New studies and data were incorporated into the hazard profiles.
- / Mapping was updated in the hazard profiles.
- / The hazard history and probability were updated in each hazard profile.

- / HAZUS data was updated and expanded upon, where possible.
- / Hazard rankings were updated to reflect current probabilities, vulnerabilities, and community prioritization. The rankings were broken down across the County geographically.

Chapter 5.0 – Mitigation Strategy

- / The Mitigation Goals, Objectives, and Proposed Actions were updated, as needed. Two new goals were added.
- / The Implementation Plan was updated to reflect new project rankings. Several projects were deleted based on their completion since the previous plan. New projects were added based on changes in hazard prioritization.
 - / A summary of changes to Mitigation Actions is provided
 - / A summary of progress on completing mitigation actions from the previous HMP (2012) is provided.
- / Detail was added to address the ability of the jurisdictions to leverage and expand upon existing policies and programs.

Chapter 6.0 – Plan Maintenance Procedures

- / Edited the maintenance plan to reflect planning for the next required update and added a recommended update timeline.

Appendix A

- / Updated the References cited in the plan (includes references cited in **Annex A**).

Appendix B

- / Updated the invited stakeholders list for the 2018 HMP. Also includes stakeholder participation invitation letters; community letters and e-mail notices for public meetings; legal notice order confirmation; and e-mail announcements and GCEM webpage postings used to solicit comments and feedback for draft versions of the HMP.

Appendix C

- / Added 2018 meeting attendance records (includes a meeting held as part of the planning process for the MSU-Bozeman PDM update – **Annex A**).

Appendix D

- / Updated the changes in the 2018 HMP update.

Appendix E

- / Review comments and input received from project stakeholders and public.

Appendix F

- / Provided the FEMA Approval documentation (i.e., Approval Letter)
- / Included the Local Mitigation Plan Review Tool (LMPRT)

Appendix G

- / Updated and included documentation of plan adoption by local jurisdictions.



APPENDIX E

PUBLIC AND STAKEHOLDER COMMENTS





APPENDIX F

FEMA APPROVAL DOCUMENTATION

1. FEMA APPROVAL LETTER
 2. LOCAL MITIGATION PLAN REVIEW TOOL
- 



FEMA

R8-MT

January 21, 2021

Scott MacFarlane, Chair
Gallatin County Commission
311 W. Main St., Room 306
Bozeman, Montana 59715

Dear Mr. MacFarlane:

We are pleased to announce the approval of the Gallatin County Hazard Mitigation Plan as meeting the requirements of the Stafford Act and Title 44 Code of Federal Regulations §201.6 for a local hazard mitigation plan. The approval extends to Gallatin County, the Cities of Bozeman and Three Forks, and the Town of Manhattan.

The jurisdictions are hereby eligible for FEMA Hazard Mitigation Assistance grant programs. All requests for funding will be evaluated individually according to the specific eligibility and other requirements of the particular programs under which the application is submitted. Approved mitigation plans may be eligible for points under the National Flood Insurance Program Community Rating System.

The plan is approved through January 20, 2026. A local jurisdiction must revise its plan and resubmit it for approval within five years to continue to be eligible for mitigation project grant funding. We have provided recommendations for the next plan update on the enclosed Plan Review Tool.

We wish to thank the County for participating in the process and commend their continued commitment to mitigation planning. Please contact Sara Hartley, State Hazard Mitigation Officer, Montana Disaster and Emergency Services, Sara.Hartley@mt.gov, or (406) 324-4794 with any questions on the plan approval or mitigation grant programs.

Sincerely,

A handwritten signature in cursive script that reads "Jeanine D. Petterson".

Jeanine D. Petterson
Mitigation Division Director

Enclosure

cc: Sara Hartley, State Hazard Mitigation Officer, Montana Disaster and Emergency Services

LOCAL MITIGATION PLAN REVIEW TOOL

The *Local Mitigation Plan Review Tool* demonstrates how the Local Mitigation Plan meets the regulation in 44 CFR §201.6 and offers States and FEMA Mitigation Planners an opportunity to provide feedback to the community.

- The Multi-jurisdiction Summary Sheet should be used to document contact information for each jurisdiction and if each met the requirements of the Plan, if a multi-jurisdictional plan.
- The Regulation Checklist provides a summary of FEMA's evaluation of whether the Plan has addressed all requirements.
- The Plan Assessment identifies the plan's strengths as well as documents areas for future improvement.

The FEMA Mitigation Planner must reference this *Local Mitigation Plan Review Guide* when completing the *Local Mitigation Plan Review Tool*.

Jurisdiction: Gallatin County, Montana	Title of Plan: Gallatin County Hazard Mitigation Plan 2018 Revision	Date of Plan: June 2019
Local Point of Contact: Patrick Lonergan	Address: 219 East Tamarack Bozeman, MT 59715	
Title: Chief of Emergency Management and Fire		
Agency: Gallatin County Emergency Management		
Phone Number: (406) 548-0116	E-Mail: patrick@readygallatin.com	

State Reviewer: Tam Kolar, Andrew Long, Kyle Sturgill-Simon, Sara Hartley	Title: Mitigation Plan Review Team	Date: 12/6/2019
----------------------------------------------------------------------------------------	----------------------------------------------	---------------------------

FEMA Reviewer: Logan Sand, IR Nicole Aimone, QC	Title: Community Planner Senior Community Planner	Date: 12/9/2019; 12/18/2020 12/10/2019; 12/18/2020
Date Received in FEMA Region VIII	11/20/2019; 12/17/2020	
Plan Not Approved	12/16/2019	
Plan Approvable Pending Adoption	12/18/2020	
Plan Approved	1/21/2021	

**SECTION 1:
MULTI-JURISDICTION SUMMARY SHEET**

MULTI-JURISDICTION SUMMARY SHEET									
#	Jurisdiction Name	Jurisdiction Type	Jurisdiction Contact	Email	Requirements Met (Y/N)				
					A. Planning Process	B. HIRA	C. Mitigation Strategy	D. Update Rqmts.	E. Adoption Resolution
1	Gallatin County, MT	County	Patrick Lonergan, Chief, Emergency Mgmt.	patrick@readygallatin.com	Y	Y	Y	Y	Y
2	City of Belgrade, MT	Incorporated Community	Ted Barkley, City Manager	tbarkley@cityofbelgrade.net	Y	Y	Y	Y	Y
3	City of Bozeman, MT	Incorporated Community	Andrea Surratt, City Manager	asurratt@bozeman.net	Y	Y	Y	Y	Y
4	City of Three Forks, MT	Incorporated Community	Crystal Turner, City Clerk/Deputy Treasurer	cturner@threeforksmontana.us	Y	Y	Y	Y	Y
5	Town of Manhattan, MT	Incorporated Community	Glen Clements, Mayor	manhattanmayor@gmail.com	Y	Y	Y	Y	Y
6	Town of West Yellowstone, MT	Incorporated Community	Dan Sabolsky, Manager	dsabolsky@townofwestyellowstone.com	Y	Y	Y	Y	Y
7	Montana State University - Bozeman	University	Dr. Waded Cruzado, President	president_cruzado@montana.edu	Y	Y	Y	Y	Y
8									
9									
10									

**SECTION 2:
REGULATION CHECKLIST**

REGULATION CHECKLIST		Location in Plan	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)		(section and/or		
ELEMENT A. PLANNING PROCESS				
A1. Does the Plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? (Requirement §201.6(c)(1))	Section 2.2 outlines the 2018 plan update process. Annex A, Section 2.1 (p. 2-1 A) summarizes MSU’s planning process. Appendix B lists invited stakeholders and plan participation, and Appendix C lists meeting attendance in each district, including MSU.		X	
A2. Does the Plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development as well as other interests to be involved in the planning process? (Requirement §201.6(b)(2))	Section 2.2 and Annex A, Section 2.1 (p. 2-1 A) provide documentation of plan participation. Appendix B lists invited stakeholders and their participation, and Appendix C documents meeting attendance.		X	
A3. Does the Plan document how the public was involved in the planning process during the drafting stage? (Requirement §201.6(b)(1))	Section 2.2.4 describes public participation and how the county was divided into five districts to encourage public interaction. Appendix C documents public meeting attendance.		X	
A4. Does the Plan describe the review and incorporation of existing plans, studies, reports, and technical information? (Requirement §201.6(b)(3))	Section 2.2.5 describes review of previous HMPs for Gallatin County, and Table 2-1 and Annex A, Section 2.2 (p. 2-1 A) list local plans, reports, and studies that were incorporated into the Plan. Appendix A includes a complete list of references.		X	

REGULATION CHECKLIST		Location in Plan	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)		(section and/or		
A5. Is there discussion of how the community(ies) will continue public participation in the plan maintenance process? (Requirement §201.6(c)(4)(iii))	Section 6.2 and Annex A, Section 6.3 (p. 6-2 A) list contact information and invite the public to provide comment.	X		
A6. Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a 5-year cycle)? (Requirement §201.6(c)(4)(i))	Section 6 and Annex A, Section 6 outline plan maintenance, and Table 6.1 provides a proposed timeline for the planned 5-year update.	X		
<u>ELEMENT A: REQUIRED REVISIONS</u>				
ELEMENT B. HAZARD IDENTIFICATION AND RISK ASSESSMENT				
B1. Does the Plan include a description of the type, location, and extent of all natural hazards that can affect each jurisdiction(s)? (Requirement §201.6(c)(2)(i))	Each hazard in Section 4 and Annex A, Section 4 includes a 'Description' sub-section (4.x.1) which contains this information.	X		
B2. Does the Plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))	Each hazard in Section 4 includes 'History' (4.x.2) and 'Probability' (4.x.3) sub-sections; and each hazard in Annex A, Section 4 includes 'History' (Annex A, 4.x.1) and 'Probability and Magnitude' (Annex A, 4.x.2) sub-sections which contain this information.	X		
B3. Is there a description of each identified hazard's impact on the community as well as an overall summary of the community's vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(ii))	Each hazard in Section 4 includes a 'Vulnerabilities' (4.x.6) sub-section; and each hazard in Annex A, Section 4 includes a 'Vulnerabilities' (4.x.3) sub-section which contain this information.	X		
B4. Does the Plan address NFIP insured structures within the jurisdiction that have been repetitively damaged by floods? (Requirement §201.6(c)(2)(ii))	Section 4.10.1.1 includes information on NFIP insured structures, including one repetitive loss structure in Gallatin County.	X		

REGULATION CHECKLIST		Location in Plan	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)		(section and/or		
<u>ELEMENT B: REQUIRED REVISIONS</u>				
ELEMENT C. MITIGATION STRATEGY				
C1. Does the plan document each jurisdiction’s existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs? (Requirement §201.6(c)(3))	Sections 3.6 and 5.4, and Annex A, Sections 5.4 thru 5.6 detail existing planning mechanisms, and each jurisdiction’s ability to expand them.	X		
C2. Does the Plan address each jurisdiction’s participation in the NFIP and continued compliance with NFIP requirements, as appropriate? (Requirement §201.6(c)(3)(ii))	Section 4.10.1.1 details participation in, and continued compliance with, the NFIP.	X		
C3. Does the Plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards? (Requirement §201.6(c)(3)(i))	Section 5 and Annex A, Section 5 include a variety of overarching goals and objectives aimed at reducing and avoiding long-term vulnerabilities.	X		
C4. Does the Plan identify and analyze a comprehensive range of specific mitigation actions and projects for each jurisdiction being considered to reduce the effects of hazards, with emphasis on new and existing buildings and infrastructure? (Requirement §201.6(c)(3)(ii))	Section 5 and Annex A, Section 5 include a range of specific projects, many that focus on protecting new and future buildings and infrastructure.	X		
C5. Does the Plan contain an action plan that describes how the actions identified will be prioritized (including cost benefit review), implemented, and administered by each jurisdiction? (Requirement §201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))	Sections 5.2 and 5.3.2 prioritize projects based on a variety of criteria outlined in Table 5-1. Annex A, Section 5.2 and Table 5.2 prioritize project implementation and Annex A, Section 5.3 provides a project timeline.	X		
C6. Does the Plan describe a process by which local governments will integrate the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate? (Requirement §201.6(c)(4)(ii))	Section 5.4 and Annex A, Section 5-6 outline how local governments will incorporate this plan into other planning mechanisms.	X		

REGULATION CHECKLIST		Location in Plan (section and/or	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)				
ELEMENT C: REQUIRED REVISIONS				
ELEMENT D. PLAN REVIEW, EVALUATION, AND IMPLEMENTATION (applicable to plan updates only)				
D1. Was the plan revised to reflect changes in development? (Requirement §201.6(d)(3))	Sections 3.6 and 5.2.1 discuss past and future development trends, and changes in mitigation actions, respectively. Data and hazards were updated where appropriate to reflect these trends. Appendix D lists plan changes.		X	
D2. Was the plan revised to reflect progress in local mitigation efforts? (Requirement §201.6(d)(3))	Section 5.3.1 summarizes progress in mitigation efforts since the 2012 HMP. Annex A, Section 5.3 and Table 5.3 summarize progress in mitigation work by MSU since the 2013 PDM Plan. Appendix D lists plan changes.		X	
D3. Was the plan revised to reflect changes in priorities? (Requirement §201.6(d)(3))	The hazards, goals, and projects were re-ranked to reflect changes since the last plan update, including changes in local priorities. Section 5.2.1 summarizes changes to mitigation actions. Plan changes are listed in Appendix D .		X	
ELEMENT D: REQUIRED REVISIONS				
ELEMENT E. PLAN ADOPTION				
E1. Does the Plan include documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval? (Requirement §201.6(c)(5))	Plan adoption is discussed in Section 2.2.4. Appendix F includes adoption documentation.			N/A

REGULATION CHECKLIST		Location in Plan (section and/or	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)				
E2. For multi-jurisdictional plans, has each jurisdiction requesting approval of the plan documented formal plan adoption? (Requirement §201.6(c)(5))	<u>Appendix F</u> includes adoption documentation for each jurisdiction.			X
<u>ELEMENT E: REQUIRED REVISIONS</u>				
ELEMENT F. ADDITIONAL STATE REQUIREMENTS (OPTIONAL FOR STATE REVIEWERS ONLY; NOT TO BE COMPLETED BY FEMA)				
F1.				
F2.				
<u>ELEMENT F: REQUIRED REVISIONS</u>				

SECTION 3:**PLAN ASSESSMENT****A. Plan Strengths and Opportunities for Improvement**

This section describes the strengths of the plan document and includes recommendations for how the plan could be improved as part of the next plan update.

Element A: Planning Process**FEMA****Strengths:**

- It is great to see new participation from the Town of Manhattan and Community of Big Sky, well done! The plan clearly describes a strategic and coordinated approach to maximize the planning process for the whole community. The geographically large and diverse planning area was ultimately divided into five community districts which allowed for greater public participation throughout plan development.
- A nice range of regulatory and non-regulatory planning and policy mechanisms *and* supporting technical documents were reviewed and incorporated into the mitigation plan. The plan includes a high-level discussion of important land use planning efforts recently completed or currently underway, such as the 2021 update to the Gallatin County Growth Policy. The plan also identifies the City of Bozeman Climate Vulnerability Assessment and Resilience Strategy as an incorporated resource to the mitigation plan.

In the next plan update, it is strongly encouraged to clearly identify *where* information and data from the *Existing Local Plans and Documents Incorporated* (Table 2-1) is located in the plan. One potential solution would be to add a third column to Table 2-1 to reference the location of information and data from local planning and document resources. This will be very helpful to any reader.

- The updated plan includes details about how the 5-year review resulted in major changes to the content and structure of the document. The plan highlights these changes which creates a nice level of transparency about the areas of improvement that were addressed between plan iterations. The plan also includes an excellent Schedule of Plan Updates (Table 6-1) for the next five years, which will be helpful to long-term plan monitoring, evaluation and periodic updates.

Opportunities for Improvement:

- In the next plan update, it will be important to clearly identify *who* represented each participating jurisdiction up front in the main plan document. Section 2.2.3 *Participating Jurisdictions* does describe the ways various representatives participated. However, it does not provide the agency name and position or titles of key representatives from participating communities. The reader is left to figure out *who* participated and *how* from the supporting documentation in Appendix B and C. It is highly recommended, at a minimum to identify lead and key jurisdictional contacts up front when introducing the planning effort.

Similarly, during the FEMA plan review process additional information was requested about the Gallatin County All Hazards All Disciplines (AHAD) group. However, some details remain unclear. For example, what are the other specific departments represented on the AHAD group? Are they just from the County, or other jurisdictions too? What are the positions or titles held by individuals? This information is not entirely clear in the main plan document, nor the supporting documentation. Consider adding a column in the supporting documentation to identify AHAD members in the next plan update. Or, ensure the main body of the plan includes information about the individuals (i.e., position or title) and specific departments that make up the AHAD group.

- The next plan update will need to provide a greater discussion about the content of public meetings or events. Please include some narrative about the type of public comments that were submitted, reviewed, and integrated into the plan. It is clear there were opportunities for the public to provide input online or during County commission and town council meetings but there is no detail. The plan does not include any public meeting agendas or summaries. It also does not mention if any comments were received. It is important to capture information about when and how the public provided input, and where in the plan public input and information can be found. One strategy for the next plan would be to include meeting minutes or summaries for public meetings or events. Another strategy could be to include a table with public comments along with the other supporting documentation. This type of documentation valuable to glean insight and transparency about public involvement in the planning process.
- The next plan update will need to include more specific narrative about how the jurisdictions will continue public outreach and engagement after plan adoption. The plan lists the Gallatin County Emergency Management mailing address to contact the AHAD Chairperson and mentions a few general ways the public will be involved (e.g., “comments will be considered during annual review of this plan. The public is also encouraged to attend the annual plan review meeting”). In the next plan update, consider building in other outreach opportunities, such as, periodic presentations on the plan’s progress to elected officials, schools or other community groups, annual questionnaires or surveys, public meetings, postings on social media and interactive websites.
- It was great to see that land use and community planning staff from Gallatin County and the City of Belgrade participated in the planning process. In the next plan update, given the rapid growth and development pressure in the City of Bozeman, please ensure planning staff or representatives with the authority to administer and regulate development (e.g., zoning, code enforcement, etc.) are also invited to participate. Participation from the City of Bozeman’s Planning Division of Community Development would have helped inform key aspects of the HMP. Their participation in the HMP process would in turn also inform the update to the City’s Community Plan. In the next plan update, the Planning Team should also strive to have participation from at least one of the Gallatin County Commissioners.

Element B: Hazard Identification and Risk Assessment**FEMA****Strengths:**

- The plan includes important updated data (e.g., 2013-2017 American Community Survey, etc.) around population, housing, and structure statistics. The number of mobile homes, age of structures, units lacking plumbing, kitchen facilities, or telephone service are all helpful pieces of information to inform overall community risk and vulnerability. The plan also does a good job to map critical facilities for the socially vulnerable (i.e., assisted living/senior housing, schools, childcare, day care and preschools). The next plan update may also want to include local homeless shelters in the analysis and mapping of the socially vulnerable. FEMA's [National Risk Index](https://www.fema.gov/flood-maps/products-tools/national-risk-index) is a useful resource to help visualize natural hazard risk metrics and data for expected annual losses, social vulnerabilities and community resilience. Visit: <https://www.fema.gov/flood-maps/products-tools/national-risk-index>
- It is great to see the plan include Future Development sections to each hazard profiled. These sections are informative and highlight potential areas of land use planning and administration that can be strengthened to advance hazard mitigation. In the next plan update, it would be great to include what jurisdictions use land use to mitigate hazards, or where in the County specific land use controls are already in place. For example, "some provisions are in place within the county subdivision regulations to restrict development in hazardous areas". It would be great to know where in the next plan update.
- Table 3-1 provides an excellent snapshot of hazards in the plan, jurisdictions affected, and *how* and *why* the hazards were identified. This table is easy for readers to understand and is ultimately supported by more detailed hazard analyses in the Risk Assessment. Overall, each of the hazards profiled in the plan are very informative and digestible for the reader.

Opportunities for Improvement:

- In the flood hazard profile, the plan states "Between Gallatin County, Bozeman and Three Forks, 863 structures are mapped in floodplains." A greater understanding of these structures, systems, and other community assets susceptible to damage and loss from flood events is needed. In the next plan update, ensure there is additional detailed property exposure and vulnerability information and analysis. What specific property (including critical facilities) is at risk, and what is the estimated value of these structures (potential loss) in the floodway, 100-year floodplain, or historic flood areas?
- The next plan update should include more detailed narrative to discuss each participating jurisdiction's unique vulnerabilities. Each hazard profile includes a Vulnerability section with narrative to address Property, Population, Economy and Future Development. Unfortunately, the narratives within each of these sections mostly applies only to Gallatin County. Each participating jurisdiction must describe the potential impacts of each of the identified hazards on their specific community assets. This description must be more than a list of the total exposure of population, structures, and critical facilities (i.e., "Property") in the planning area. The overall summary should be in the form of key issues or problem statements that clearly describe each community's greatest vulnerabilities that will be

addressed in the mitigation strategy. These vulnerability assessments should inform the mitigation projects specific to each participating jurisdiction.

- In the next plan update, when describing the extent of a hazard using a specific measurement of an occurrence on a scientific scale, be sure to include the type of scale that is referenced. For example, the Earthquake profile discusses magnitude without mentioning the scale being used. Is magnitude in the plan being measured on the Richter or Mercalli scale? The MSU Annex uses the Richter Scale, but the main body of the plan does not state this information.

Element C: Mitigation Strategy

FEMA

Strengths:

- The plan discusses several planning mechanisms used to guide future development and reduce hazard risk. The sections discussing Gallatin County's Growth Policy update and Subdivision Regulations are helpful to understanding land use planning and administration at the county level. The plan also discusses the City of Bozeman Community Plan and the Belgrade Growth Policy (both currently being updated), and the Gallatin Triangle Planning Study, which includes recommendations for regional planning cooperation between Gallatin County and the cities of Belgrade and Bozeman. It is also great to see these same planning mechanisms integrated into the 2019 CWPP.

Opportunities for Improvement:

- In the next plan update, the County and participating communities will need to expand on each jurisdiction's existing authorities, policies, programs and resources available to accomplish hazard mitigation (e.g., a "capability assessment"). Examples of local capabilities for detailed assessment include but are not limited to: staff (human resources and capacity) involved in local planning activities, public works, and emergency management; funding through taxing authority, and annual budgets; or regulatory authorities for comprehensive planning, building codes, and ordinances. It is acknowledged that there are local capacity concerns and other community/political barriers to mitigation. It will be very helpful to provide additional information and insight into local conditions in future updates. See [Section 4.1 on Capability Assessments in the Local Hazard Mitigation Planning Handbook](#).
- While the plan does include Growth Policies, the information is *very* general and does not provide clear insight or connection to hazard risk reduction (both in Section 3.6 and 5.4). How do the Growth Policies tie into mitigation for each jurisdiction? What hazards are discussed in respective Growth Policies, and how can they be leveraged to accomplish mitigation? Similarly, how do Zoning Regulations and Capital Improvement Plans or budgets function for each applicable jurisdiction? The hazard information provided in the Subdivision Regulations (in Section 3.6) is a good example of the level of detail needed for all local planning and regulatory mechanisms assessed for participating communities. For another good example of what will be expected see Section 5.3.3.2 *Promote Implementation of WUI Policies and Regulations* of the Community Planning Assistance for Wildfire (CPAW) report (annex).

It is acknowledged that making connections between policies and programs is difficult, and that some local agencies may have a mixed stance on regulations and are very cautious about adding more process or regulation. However, avoiding or directing development away from natural hazard areas is key to safe and smart growth – which is especially important given the explosive growth across Gallatin County. If the County and communities need support to “make the case” for the importance, value and effectiveness of mitigation and “why” to integrate resilience into non-regulatory or regulatory planning mechanisms, please reach out to MT DES or FEMA Region VIII staff.

- Unfortunately, some of the projects listed in the Mitigation Strategy are vague, lacking detail and description. For example, “Continue annual education campaign on flood insurance”, “Continued support for Stormwater Management projects in Bozeman, Belgrade and Manhattan”, “Expansion Joints for Utilities”, and “Conduct seismic bridge inspections” are identified as projects. However, what are the specific actions or activities for each project? What events or engagement techniques (e.g., types of events and outreach, education and awareness materials, etc. will be used to the education campaign on flood insurance? How will communities show “continued support” for stormwater projects exactly? Where will expansion joints for utilities be located? Who will be conducting seismic surveys or inspections (this capacity should be included in the capability assessment)?

Referenced earlier, please look at FEMA’s Local Mitigation Planning Handbook for updates to the Mitigation Strategy. It is located here: <https://www.fema.gov/media-library/assets/documents/31598>. In particular, see Task 6 – Develop a Mitigation Strategy for expectations and examples of the level of detail that needs to go into each mitigation action. Also, see Worksheet 6.2 - Mitigation Action Implementation Worksheet to support the development of each mitigation action.

- The next plan will need to be more specific about how information and recommendations will be used to improve existing plans, policies, and programs. The section on Existing Programs (Section 5.4) states “All planning departments participated in the development of this plan. Several jurisdictions had planning documents under development concurrently (see section 3.6) with this plan and worked to ensure the plans were aligned. It is not perceived by stakeholders that development since the 2012 plan has altered the overall risk present anywhere in the County. All areas of the County face multiple hazards, many of which require significant work to mitigate to any measurable degree.” Unfortunately, neither Section 3.6, nor Section 5.4 tells us about *how* mitigation will be advanced through these mechanisms for each participating community.

In the next update, please include some detailed discussion about how Gallatin County and participating jurisdictions will implement hazard mitigation projects through existing procedures or programs, etc. What is the mitigation integration technique? Will mitigation strategies be integrated into growth policy updates, and for which specific communities? Will the mitigation plan be incorporated into revisions of zoning codes or subdivision and floodplain regulations? Consider providing a summary and/or able for the implementation of mitigation into existing plans, policies, codes, programs, etc.

Existing Programs (Section 5.4) identifies various plan types (e.g., Growth Policies, CIP, and Subdivision Regulations, etc.), which is a good first step. However, the plan needs to include more specific information about (or steps for) each participating community's process to integrate the mitigation plan. Stating, "hazard information and recommendations presented in this plan will be available for incorporation into current and future planning initiatives by each jurisdiction" is not an actionable statement of commitment to mitigation. The Plan needs to tell us what HMP information will be integrated or provide a process for how it will be integrated into each community. To meet this requirement, please provide additional details about how each community will integrate the requirements of the mitigation plan into other planning mechanisms.

Again, FEMA understands local officials may be reluctant or ask "why?" when it comes to doing mitigation. If communities need to better understand the value of mitigation and resilience, please contact the MT DES or FEMA Region VIII staff who will share best practices from similar Northwest communities that are seeing the financial return of investment to incorporate and integrate mitigation and resilience practices up front into their land use and building code processes.

- The Mitigation Implementation Plan is not very specific with regards to the "Responsible Department/Partner" and "Potential Funding". The next plan update must specifically identify the position, office, department, or agency responsible for implementing and administering the action (for each jurisdiction) and identify potential and specific funding sources and expected timeframes for completion. The Mitigation Implementation Plan includes a "Potential Funding" category which identifies agencies, not specific grant programs (e.g., HMGP, PDM, etc.). The next update will need to also identify potential local funding mechanisms, and it will be required to include an estimated timeframe of completion for each action.

Element D: Plan Review, Evaluation, and Implementation (Plan Updates Only)

FEMA

Strengths:

- It is great to see that approximately two-thirds of the mitigation actions identified (21 of 31) have been either fully or partially completed since 2012. Section 5.3.1 includes concise and informative project highlights for each goal of the 2012 HMP. The County and jurisdictions have made a lot of mitigation progress.

Opportunities for Improvement:

- In this plan update, Section 3.6 generally discusses the increased population for the county and lists the various communities' growth policies. Given the tremendous growth in the County and jurisdictions, the plan update needs to include more detailed narratives and maps of recent and potential new development that are in proximity to hazard-prone areas, which may be found in the growth policies. For example, the plan could first identify proposed subdivisions, areas of planned residential growth, or new critical facilities on a map. The plan could then add some narrative about how future development will increase each community's vulnerability. This will strengthen overall vulnerability analyses and will make each community's risk more transparent.

In respect to drought (one of the plans highest priority hazards), the impact of future development is considered low, even though the plan acknowledges that developed portions of the county have the highest density of water demand. That is a bit of a disconnect and must be clarified in the next Plan Update. “Future development’s greatest impact on the drought hazard would be through possibly limiting ground water resources. Fortunately, public systems, individual wells, and septic systems are carefully monitored and regulated by Montana Department of Environmental Quality. Therefore, the impact of future development with respect to drought is considered low.” It’s great that MT DEQ is available to monitor some aspects of water, however, it is likely that there may be a future need for drought mitigation projects that incorporate long term land development. The next Plan Update should consider this and clarify how drought is one of the highest priority hazards and how future development will amplify community risk.

B. Resources for Implementing Your Approved Plan

FEMA FUNDING SOURCES

Hazard Mitigation Grant Program (HMGP). The HMGP is a post-disaster mitigation program. It is made available to states by FEMA after each Federal disaster declaration. The HMGP can provide up to 75 percent funding for hazard mitigation measures. The HMGP can be used to fund cost-effective projects that will protect public or private property in an area covered by a federal disaster declaration or that will reduce the likely damage from future disasters. Examples of projects include acquisition and demolition of structures in hazard prone areas, flood-proofing or elevation to reduce future damage, minor structural improvements and development of state or local standards. Applicants who are eligible for the HMGP are state and local governments, certain nonprofit organizations or institutions that perform essential government services, and Indian tribes and authorized tribal organizations. Individuals or homeowners cannot apply directly for the HMGP; a local government must apply on their behalf. Applications are submitted to Montana DES and placed in rank order for available funding and submitted to FEMA for final approval. Eligible projects not selected for funding are placed in an inactive status and may be considered as additional HMGP funding becomes available. More information: <https://www.fema.gov/hazard-mitigation-grantprogram>

Building Resilient Infrastructure and Communities (BRIC) Grant Program. The BRIC program supports states, local communities, tribes and territories as they undertake hazard mitigation projects, reducing the risks they face from disasters and natural hazards. BRIC is a new FEMA pre-disaster hazard mitigation program that replaces the existing Pre-Disaster Mitigation (PDM) program. The BRIC program guiding principles are supporting communities through capability- and capacity-building; encouraging and enabling innovation; promoting partnerships; enabling large projects; maintaining flexibility; and providing consistency: <https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities>

Rehabilitation of High Hazard Potential Dams (HHPD) Grant Program. This program provides technical, planning, design, and construction assistance in the form of grants for rehabilitation of eligible high hazard potential dams. For more information, please visit:

<https://www.fema.gov/emergency-managers/risk-management/dam-safety/grants#hhpd>

Flood Mitigation Assistance (FMA) Grant Program. FMA provides funding to assist states and communities in implementing measures to reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other structures insurable under the NFIP. The FMA is funded annually; no federal disaster declaration is required. Only NFIP insured homes and businesses are eligible for mitigation in this program. Funding for FMA is very limited and, as with the HMGP, individuals cannot apply directly for the program. Applications must come from local governments or other eligible organizations. The federal cost share for an FMA project is 75 percent. At least 25 percent of the total eligible costs must be provided by a non-federal source. Of this 25 percent, no more than half can be provided as in-kind contributions from third parties. FMA funds are distributed from FEMA to the state. Montana DES serves as the grantee and program administrator for FMA. More information: <https://www.fema.gov/flood-mitigation-assistance-grant-program>

Fire Management Assistance Grant (FMAG) Program. The FMAG program provides grants to states, tribal governments and local governments for the mitigation, management and control of any fire burning on publicly (non-federal) or privately owned forest or grassland that threatens such destruction as would constitute a major disaster. The grants are made in the form of cost sharing with the federal share being 75 percent of total eligible costs. Grant approvals are made within 1 to 72 hours from time of request. More information: <http://www.fema.gov/fire-management-assistance-grant-program>

Hazard Mitigation Grant Program (HMGP) Post Fire Grant Program. FEMA's Hazard Mitigation Grant Program (HMGP) has Post Fire assistance available to help communities implement hazard mitigation measures after wildfire disasters. States, federally-recognized tribes and territories affected by fires resulting in an [Fire Management Assistance Grant \(FMAG\)](#) declaration on or after October 5, 2018, are eligible to apply. More information: <https://www.fema.gov/grants/mitigation/post-fire>

Fire Prevention and Safety (FP&S) Grants. FP&S Grants support projects that enhance the safety of the public and firefighters from fire and related hazards. The primary goal is to target high-risk populations and reduce injury and prevent death. Eligibility includes fire departments, national, regional, state, and local organizations, Native American tribal organizations, and/or community organizations recognized for their experience and expertise in fire prevention and safety programs and activities. Private non-profit and public organizations are also eligible. Interested applicants are advised to check the website periodically for announcements of grant availability: <https://www.fema.gov/welcome-assistance-firefighters-grant-program>

OTHER MITIGATION FUNDING SOURCES

Grant funding is available from a variety of federal and state agencies for training, equipment, and hazard mitigation activities. Several of these programs are described below.

Rural Fire Capacity Program. The purpose of these grants is to organize, train and equip local firefighters to prevent and suppress wildfires. Communities under 10,000 in population are eligible for the funding. Smaller communities may join together in a group and or county effort to submit an application, even if their combined population is over 10,000. There is no pre-set award amount. Financial assistance on any project, during any fiscal year, requires a non-federal match for project expenditures. More information: <http://dnrc.mt.gov/grants-and-loans>

Conservation District Grants. This program provide funds to increase conservation district employee's hours to assist in planning, securing funding, and implementing programs that improve public outreach, improve conservation district administrative capabilities, and implement conservation plans. There is a \$10,000 award amount. More information: <http://dnrc.mt.gov/grants-and-loans>

Hazardous Fuel Reduction Grants. These grants are for hazardous fuel reduction on private lands to protect communities adjacent to National Forest System Lands where prescribed fire activities are planned. Prescribed fire activities must be imminent (to take place within 3 years of the award). Non-profit organizations, conservation districts, county and municipal governments, fire departments are eligible for this funding. Award amounts typically range from \$50,000 to \$100,000 depending upon availability of funding. More information: <http://dnrc.mt.gov/grants-and-loans>

Renewable Resource Grant Program. Administered by the Montana DNRC, this program provides both grant and loan funding for public facility and other renewable resource projects. Projects that conserve, manage, develop or protect Montana's renewable resources are eligible for funding. Numerous public facility projects including drinking water, wastewater and solid waste development and improvement projects have received funding through this program. Other projects that have been funded include irrigation rehabilitation, dam repair, soil and water conservation and forest enhancement. More information: <http://dnrc.mt.gov/grants-and-loans>

Program 15.228: Wildland Urban Interface Community and Rural Fire Assistance. [This program](#) is designed to implement the National Fire Plan and assist communities at risk from catastrophic wildland fires. The program provides grants, technical assistance, and training for community programs that develop local capability, including: Assessment and planning, mitigation activities, and community and homeowner education and action; hazardous fuels reduction activities, including the training, monitoring or maintenance associated with such hazardous fuels reduction activities, on federal land, or on adjacent nonfederal land for activities that mitigate the threat of catastrophic fire to communities and natural resources in high risk areas; and, enhancement of knowledge and fire protection capability of rural fire districts through assistance in education and training, protective clothing and equipment purchase, and mitigation methods on a cost share basis.

Secure Rural Schools and Community Self-Determination Act - Title III- County Funds. The Self-Determination Act has recently been reauthorized and now includes specific language regarding the Firewise Communities program. Counties seeking funding under Title III must use the funds to

perform work under the Firewise Communities program. Counties applying for Title III funds to implement Firewise activities can assist in all aspects of a community's recognition process, including conducting or assisting with community assessments, helping the community create an action plan, assisting with an annual Firewise Day, assisting with local wildfire mitigation projects, and communicating with the state liaison and the national program to ensure a smooth application process. Counties that previously used Title III funds for other wildfire preparation activities such as the Fire Safe Councils or similar would be able to carry out many of the same activities as they had before. However, with the new language, counties would be required to show that funds used for these activities were carried out under the Firewise Communities program. For more information, [click here](#).

Community Planning Assistance for Wildfire. Established in 2015 by Headwaters Economics and Wildfire Planning International, Community Planning Assistance for Wildfire (CPAW) works with communities to reduce wildfire risks through improved land use planning. CPAW is a grant-funded program providing communities with professional assistance from foresters, planners, economists and wildfire risk modelers to integrate wildfire mitigation into the development planning process. All services and recommendations are site-specific and come at no cost to the community. More information: <http://planningforwildfire.org/what-we-do/>

Urban and Community Forestry (UCF) Program. A cooperative program of the U.S. Forest Service that focuses on the stewardship of urban natural resources. With 80 percent of the nation's population in urban areas, there are strong environmental, social, and economic cases to be made for the conservation of green spaces to guide growth and revitalize city centers and older suburbs. UCF responds to the needs of urban areas by maintaining, restoring, and improving urban forest ecosystems on more than 70 million acres. Through these efforts the program encourages and promotes the creation of healthier, more livable urban environments across the nation. These grant programs are focused on issues and landscapes of national importance and prioritized through state and regional assessments. Information: <http://www.fs.fed.us/managing-land/urban-forests/ucf>

Western Wildland Urban Interface Grants. The National Fire Plan (NFP) is a long-term strategy for reducing the effects of catastrophic wildfires throughout the nation. The Division of Forestry's NFP Program is implemented within the Division's Fire and Aviation Program through the existing USDA Forest Service, State & Private Forestry, State Fire Assistance Program.

Congress has provided increased funding assistance to states through the U.S. Forest Service State and Private Forestry programs since 2001. The focus of much of this additional funding was mitigating risk in WUI areas. In the West, the State Fire Assistance funding is available and awarded through a competitive process with emphasis on hazard fuel reduction, information and education, and community and homeowner action. This portion of the National Fire Plan was developed to assist interface communities manage the unique hazards they find around them. Long-term solutions to interface challenges require informing and educating people who live in these areas about what they and their local organizations can do to mitigate these hazards.

The 10-Year Comprehensive Strategy focuses on assisting people and communities in the WUI to moderate the threat of catastrophic fire through the four broad goals of improving prevention and

suppression, reducing hazardous fuels, restoring fire-adapted ecosystems, and promoting community assistance. The Western States Wildland Urban Interface Grant may be used to apply for financial assistance towards hazardous fuels and educational projects within the four goals of: improved prevention, reduction of hazardous fuels, and restoration of fire-adapted ecosystems and promotion of community assistance. More information: <https://www.westernforesters.org/wui-grants>

U.S. Fish & Wildlife Service, Rural Fire Assistance Grants. Each year, the U.S. Fish & Wildlife Service (FWS) provides Rural Fire Assistance (RFA) grants to neighboring community fire departments to enhance local wildfire protection, purchase equipment, and train volunteer firefighters. Service fire staff also assist directly with community projects. These efforts reduce the risk to human life and better permit FWS firefighters to interact and work with community fire organizations when fighting wildfires. The Department of the Interior (DOI) receives an appropriated budget each year for an RFA grant program. The maximum award per grant is \$20,000. The DOI assistance program targets rural and volunteer fire departments that routinely help fight fire on or near DOI lands. More information: http://www.fws.gov/fire/living_with_fire/rural_fire_assistance.shtml

U.S. Bureau of Land Management, Community Assistance Program. BLM provides funds to communities through assistance agreements to complete mitigation projects, education and planning within the WUI. More information: <https://www.blm.gov/services/financial-assistance-and-grants>

NOAA Office of Education Grants. The Office of Education supports formal, informal and non-formal education projects and programs through competitively awarded grants and cooperative agreements to a variety of educational institutions and organizations in the United States. More information: <http://www.noaa.gov/office-education/grants>

NRCS Environmental Quality Incentives Program (EQIP). The Environmental Quality Incentives Program, administered through the NRCS, is a cost-share program that provides financial and technical assistance to agricultural producers to plan and implement conservation practices that improve soil, water, plant, animal, air and related natural resources on agricultural land and non-industrial private forestland. Owners of land in agricultural or forest production or persons who are engaged in livestock, agricultural or forest production on eligible land and that have a natural resource concern on that land may apply to participate in EQIP. Eligible land includes cropland, rangeland, pastureland, non-industrial private forestland and other farm or ranch lands. EQIP is another funding mechanism for landowner fuel reduction projects. More information: <https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/eqip/>

U.S. Department of Agriculture, Community Facilities Loans and Grants. Provides grants (and loans) to cities, counties, states and other public entities to improve community facilities for essential services to rural residents. Projects can include fire and rescue services; funds have been provided to purchase fire-fighting equipment for rural areas. No match is required. More information: http://www.usda.gov/wps/portal/usda/usdahome?navid=GRANTS_LOANS

General Services Administration, Sale of Federal Surplus Personal Property. This program sells property no longer needed by the federal government. The program provides individuals,

businesses and organizations the opportunity to enter competitive bids for purchase of a wide variety of personal property and equipment. Normally, there are no restrictions on the property purchased. More information: <http://www.gsa.gov/portal/category/21045>

Hazardous Materials Emergency Preparedness Grants. Grant funds are passed through to local emergency management offices and HazMat teams having functional and active LEPC groups. More information: <http://www.phmsa.dot.gov/hazmat/grants>

U.S. Department of Homeland Security. Enhances the ability of states, local and tribal jurisdictions, and other regional authorities in the preparation, prevention, and response to terrorist attacks and other disasters, by distributing grant funds. Localities can use grants for planning, equipment, training and exercise needs. These grants include, but are not limited to areas of Critical Infrastructure Protection Equipment and Training for First Responders, and [Homeland Security Grants](#).

Community Development Block Grants (CDBG). The U.S. Department of Commerce administers the CDBG program which are intended to provide low and moderate-income households with viable communities, including decent housing, as suitable living environment, and expanded economic opportunities. Eligible activities include community facilities and improvements, roads and infrastructure, housing rehabilitation and preservation, development activities, public services, economic development, planning, and administration. Public improvements may include flood and drainage improvements. In limited instances, and during the times of “urgent need” (e.g. post disaster) as defined by the CDBG National Objectives, CDBG funding may be used to acquire a property located in a floodplain that was severely damaged by a recent flood, demolish a structure severely damaged by an earthquake, or repair a public facility severely damaged by a hazard event. CDBG funds can be used to match FEMA grants. More Information: https://www.hud.gov/program_offices/comm_planning/cdbg

Building Blocks for Sustainable Communities. The EPA Office of Sustainable Communities sometimes offers grants to support activities that improve the quality of development and protect human health and the environment. When these grants are offered, they will always be announced on www.grants.gov. More information: <https://www.epa.gov/smartgrowth/building-blocks-sustainable-communities#2016>

OTHER RESOURCES

FEMA: Grant Application Training. Each year, FEMA partners with the State on training courses designed to help communities be more successful in their applications for grants. Contact your State Hazard Mitigation Officer for course offering schedules. Example Courses:

- Unified Hazard Mitigation Grant Assistance Application Development Course
- [Benefit Cost Analysis \(BCA\)](#) Course

FEMA: Community Assistance Visit. It may be appropriate to set up a Community Assistance Visit with FEMA to provide technical assistance to communities in the review and/or updating of their

floodplain ordinances to meet the new model ordinance. Consider contacting your State NFIP Coordinator for more information.

FEMA: Building Science. The Building Science branch develops and produces multi-hazard mitigation publications, guidance materials, tools, technical bulletins, and recovery advisories that incorporate the most up-to-date building codes, floodproofing requirements, seismic design standards, and wind design requirements for new construction and the repair of existing buildings. To learn more, visit: <https://www.fema.gov/building-science>

EPA: Smart Growth in Small Towns and Rural Communities. EPA has consolidated resources just for small towns and rural communities to help them achieve their goals for growth and development while maintaining their distinctive rural character. To learn more, visit: <https://www.epa.gov/smartgrowth/smart-growth-small-towns-and-rural-communities>

EPA: Hazard Mitigation for Natural Disasters: A Starter Guide for Water and Wastewater Utilities. The EPA released guidance on how to mitigate natural disasters specifically for water and wastewater utilities. For more information, visit: <https://www.epa.gov/waterutilityresponse/hazard-mitigation-natural-disasters>

National Integrated Drought Information System. The National Drought Resilience Partnership may provide some additional resources and ideas to mitigate drought hazards and increase awareness of droughts. Visit: <https://www.drought.gov/drought/what-nidis/national-drought-resilience-partnership>.

Beyond the Basics: Best Practices in Local Mitigation Planning. The product of a 5-year research study where the Coastal Hazards Center and the Center for Sustainable Community Design analyzed local mitigation plans to assess their content and quality. The website features numerous examples and best practices that were drawn from the analyzed plans. Visit: <http://mitigationguide.org/>

STAR Community Rating System. Consider measuring your mitigation success by participating in the STAR Community Rating System. Local leaders can use the STAR Community Rating System to assess how sustainable they are, set goals for moving ahead and measure progress along the way. To get started, go to <http://www.starcommunities.org/get-started>

Flood Economics. The Economist Intelligence Unit analyzed case studies and state-level mitigation data in order to gain a better understanding of the economic imperatives for investment in flood mitigation. To learn more, visit: <http://floodeconomics.com/>

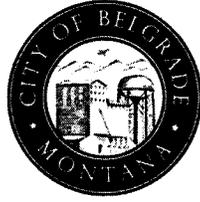
Headwaters Economics. Headwaters Economics is an independent, nonprofit research group that works to improve community development and land management decisions in the West. To learn more, visit: <https://headwaterseconomics.org/>



APPENDIX G

LOCAL PLAN ADOPTION DOCUMENTATION





RESOLUTION NO. 2021- 9

**TO APPROVE THE GALLATIN COUNTY HAZARD MITIGATION AND
COMMUNITY WILDFIRE PROTECTION PLAN
FOR CITY OF BELGRADE, MONTANA**

This Resolution was introduced by Patrick Lonergan, Gallatin County Chief of Emergency Management and Fire.

WHEREAS, all citizens and property within the City of Belgrade are at risk from a wide range of hazards such as, but not limited to, aviation accidents, bioterrorism, civil unrest, communicable disease, drought, earthquake, extended cold, flooding, ground transportation accidents, hazardous materials release, railroad accidents, severe thunderstorms, terrorism, tornadoes, utility outage, violence, volcano, wildfire, wind, and winter storms;

WHEREAS, the City of Belgrade, pursuant to Section 322, Mitigation Planning, of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, enacted by Section 104 of the Disaster Mitigation Act of 2000 (P.L. 106-390) and the Interim Final Rule published in the Federal Registry on February 26, 2002 at 44 CFR Part 201, is required to have an approved Hazard Mitigation Plan in order to receive future federal disaster mitigation funds; and

WHEREAS, a Hazard Mitigation Plan will guide the City of Belgrade in making decisions for pre-disaster and post-disaster mitigation projects.

WHEREAS, the City of Belgrade, pursuant to the Healthy Forest Restoration Act of 2003 is encouraged to develop a Community Wildfire Protection Plan to help reduce the risk to wildfire loss and create healthy ecosystems.

WHEREAS, a Community Wildfire Protection Plan will guide City of Belgrade in making decisions for wildfire response and mitigation projects.

NOW, THEREFORE, BE IT RESOLVED by the Belgrade City Council that the City of Belgrade does hereby adopt the Gallatin County Hazard Mitigation and Community Wildfire Protection Plan dated November 2020 and attached hereto as Exhibit A pending approval from the Federal Emergency Management Agency.

DATED this 16th day of February, 2021

Russell C. Nelson, Mayor

ATTEST

Susan Caldwell, City Clerk



RESOLUTION 5256

A RESOLUTION OF THE CITY COMMISSION OF THE CITY OF BOZEMAN, MONTANA, APPROVING THE GALLATIN COUNTY HAZARD MITIGATION AND COMMUNITY WILDFIRE PROTECTION PLAN.

WHEREAS, all citizens and property within the City of Bozeman are at risk from a wide range of hazards such as, but not limited to, aviation accidents, bioterrorism, civil unrest, communicable disease, drought, earthquake, extended cold, flooding, ground transportation accidents, hazardous materials release, railroad accidents, severe thunderstorms, terrorism, tornadoes, utility outage, violence, volcano, wildfire, wind, and winter storms;

WHEREAS, the City of Bozeman, pursuant to Section 322, Mitigation Planning, of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, enacted by Section 104 of the Disaster Mitigation Act of 2000 (P.L. 106-390) and the Interim Final Rule published in the Federal Registry on February 26, 2002 at 44 CFR Part 201, is required to have an approved Hazard Mitigation Plan in order to receive future federal disaster mitigation funds; and

WHEREAS, a Hazard Mitigation Plan will guide the City of Bozeman in making decisions for pre-disaster and post-disaster mitigation projects.

WHEREAS, the City of Bozeman, pursuant to the Healthy Forest Restoration Act of 2003 is encouraged to develop a Community Wildfire Protection Plan to help reduce the risk to wildfire loss and create healthy ecosystems.

WHEREAS, a Community Wildfire Protection Plan will guide City of Bozeman in making decisions for wildfire response and mitigation projects.

NOW, THEREFORE, BE IT RESOLVED by the City Commission of the City of Bozeman, Montana, to wit: that the City of Bozeman Commission does hereby approves the Gallatin County Hazard Mitigation and Community Wildfire Protection Plan dated November 2020 and attached hereto pending approval from the Federal Emergency Management Agency

PASSED, ADOPTED, AND APPROVED by the City Commission of the City of Bozeman, Montana, at a regular session thereof held on the 12th day of January, 2021.

DocuSigned by:



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CYNTHIA L. ANDRUS

Mayor

ATTEST:

DocuSigned by:



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MIKE MAAS

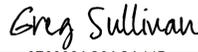
City Clerk

DocuSigned by:



APPROVED AS TO FORM:

DocuSigned by:



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GREG SULLIVAN

City Attorney

Due to the size of Hazard Mitigation and Community Wildfire Protection Plan, the plan could not be attached. It can be found here:

<http://weblink.bozeman.net/WebLink8/0/doc/229741/Electronic.aspx>

RESOLUTION APPROVING HAZARD MITIGATION AND COMMUNITY WILDFIRE PROTECTION PLAN FOR
GALLATIN COUNTY, MONTANA

This Resolution was introduced by Patrick Lonergan, Chief of EM & Fire, moved by SKINNER, and seconded by BROWN. The Resolution was adopted by a vote of 3-0.

WHEREAS, all citizens and property within Gallatin County are at risk from a wide range of hazards such as, but not limited to, aviation accidents, bioterrorism, civil unrest, communicable disease, drought, earthquake, extended cold, flooding, ground transportation accidents, hazardous materials release, railroad accidents, severe thunderstorms, terrorism, tornadoes, utility outage, violence, volcano, wildfire, wind, and winter storms;

WHEREAS, Gallatin County, pursuant to Section 322, Mitigation Planning, of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, enacted by Section 104 of the Disaster Mitigation Act of 2000 (P.L. 106-390) and the Interim Final Rule published in the Federal Registry on February 26, 2002 at 44 CFR Part 201, is required to have an approved Hazard Mitigation Plan in order to receive future federal disaster mitigation funds; and

WHEREAS, a Hazard Mitigation Plan will guide Gallatin County in Making decisions for pre-disaster and post-disaster mitigation projects.

WHEREAS, Gallatin County, pursuant to the Healthy Forest Restoration Act of 2003 is encouraged to develop a Community Wildfire Protection Plan to help reduce the risk to wildfire loss and create healthy ecosystems.

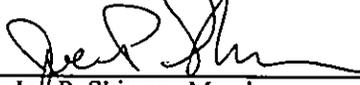
WHEREAS, a Community Wildfire Protection Plan will guide Gallatin County in making decisions for wildfire response and mitigation projects.

NOW, THEREFORE, it is hereby resolved that the Gallatin County Commission does hereby adopt the Gallatin County Hazard Mitigation and Community Wildfire Protection Plan dated November 2020 and attached hereto as Exhibit A pending approval from the Federal Emergency Management Agency,

DATED AND PASSED this 5th day of January, 2021.



Scott MacFarlane, Chair

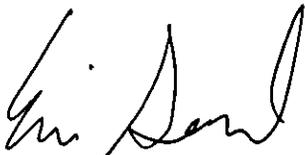


Joe P. Skinner, Member



Zach Brown, Member

ATTEST:



Eric Semerad, Clerk & Recorder

Resolution No. 21-001

A RESOLUTION OF THE TOWN COUNCIL OF THE TOWN OF MANHATTAN, MT APPROVING
THE GALLATIN COUNTY HAZARD MITIGATION AND COMMUNITY WILDFIRE
PROTECTION PLAN

This Resolution was introduced by Patrick Lonergan, Emergency Manager, moved by Hamilton, and seconded by Ryan. The Resolution was adopted by a vote of 4-0.

WHEREAS, all citizens and property within the Town of Manhattan are at risk from a wide range of hazards such as, but not limited to, aviation accidents, bioterrorism, civil unrest, communicable disease, drought, earthquake, extended cold, flooding, ground transportation accidents, hazardous materials release, railroad accidents, severe thunderstorms, terrorism, tornadoes, utility outage, violence, volcano, wildfire, wind, and winter storms;

WHEREAS, the Town of Manhattan, pursuant to Section 322, Mitigation Planning, of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, enacted by Section 104 of the Disaster Mitigation Act of 2000 (P.L. 106-390) and the Interim Final Rule published in the Federal Registry on February 26, 2002 at 44 CFR Part 201, is required to have an approved Hazard Mitigation Plan in order to receive future federal disaster mitigation funds; and

WHEREAS, a Hazard Mitigation Plan will guide the Town of Manhattan in making decisions for pre-disaster and post-disaster mitigation projects.

WHEREAS, the Town of Manhattan, pursuant to the Healthy Forest Restoration Act of 2003 is encouraged to develop a Community Wildfire Protection Plan to help reduce the risk to wildfire loss and create healthy ecosystems.

WHEREAS, a Community Wildfire Protection Plan will guide Town of Manhattan in making decisions for wildfire response and mitigation projects.

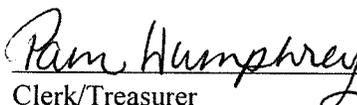
NOW, THEREFORE, it is hereby resolved that the Manhattan Town Council does hereby adopt the Gallatin County Hazard Mitigation and Community Wildfire Protection Plan dated November 2020 and attached hereto as Exhibit A pending approval from the Federal Emergency Management Agency,

DATED AND PASSED this 10th day of January, 2021.



Mayor

ATTEST:



Clerk/Treasurer



March 5, 2021

TO: Dr. Waded Cruzado, President
Montana State University

FROM: Royce Smith, Chair
John How, Vice Chair
University Facilities Planning Board

RE: University Facilities Planning Board Recommendation

In accordance with the unanimous recommendation [18 YES] of the University Facilities Planning Board (UFPB) on March 2, 2021 we request approval for MSU to adopt Gallatin County's *Hazard Mitigation and Community Wildfire Protection Plan*.

The *Hazard Mitigation and Community Wildfire Protection Plan* outlines pre-emptive strategies to protect life, property and economic values in the community and provides a resiliency course of action in the event of a disaster. This plan was developed by collaboration between many stakeholders in Gallatin County, including MSU. The plan addresses many topics of resiliency planning and disaster preparedness, in both the larger community of Gallatin County and specific to MSU.

CM/oh

cc: Dan Stevenson, Associate VP, University Services
John How, Director, CPDC
EJ Hook, Director, Facilities Services
Tom Pike, Facilities Services

APPROVED:

DocuSigned by:
Waded Cruzado
Waded Cruzado, President

3/17/2021 | 7:24 AM PDT

**Campus Planning,
Design & Construction**

Plew Building, 6th & Grant St.
P.O. Box 172760
Bozeman, MT 59717-2760
www.montana.edu/us/pdc

Tel 406-994-5413
Fax 406-994-5665

CITY OF THREE FORKS, MONTANA

RESOLUTION #339-2021

RESOLUTION OF THE THREE FORKS CITY COUNCIL ADOPTING THE GALLATIN COUNTY HAZARD MITIGATION AND COMMUNITY WILDFIRE PROTECTION PLAN UPDATES AS OF JANUARY 2021

WHEREAS, all citizens and property with the City of Three Forks are at risk to a wide range of hazards such as but not limited to, aviation accidents, bioterrorism, civil unrest, communicable disease, drought, earthquake, extended cold, flooding, ground transportation accidents, hazardous materials release, railroad accidents, severe thunderstorms, terrorism, tornadoes, utility outage, violence, volcano, wildfire, wind, and winter storms; and

WHEREAS, when such an unfortunate event occurs, local state and federal response agencies must be prepared to respond in a well-coordinated manner by developing and using the Gallatin County Incident Management System, in accordance with the National Incident Management System, to protect the public and the natural resources and minimize property damage within the community; and

WHEREAS, the Hazard Mitigation Act of 2000 created the authority for a risk based approach towards reducing hazards; the Act further required states, counties and cities to have a FEMA approved plan every five years in order to be eligible for non-emergency federal assistance; and

WHEREAS, a Hazard Mitigation Plan will guide Three Forks in making decisions for pre-disaster and post-disaster mitigation projects; and

WHEREAS, a Community Wildfire Protection Plan will guide Gallatin County in Making decisions for wildfire response and mitigation projects; and

WHEREAS, the Gallatin County Emergency Management Plan is needed to coordinate the response of emergency personnel and supporting services of all county and municipal agencies in the event of an emergency or disaster and during the aftermath thereof; and

CITY OF THREE FORKS, MONTANA

WHEREAS, Gallatin County Emergency Management coordinated a series of public outreach meetings to garner input from the community on revisions to the Plan starting in the fall of 2017 through 2018. Those comments were incorporated into the 5-year update then the draft was distributed to all municipalities and the county spring of 2019 to review and make comments on any further edits. The final draft was submitted to the State of Montana's Disaster and Emergency Services Division and finally to FEMA in August 2019.

NOW, THEREFORE BE IT RESOLVED by the Three Forks City Council that it adopts the Gallatin County Hazard Mitigation and Community Wildfire Protection Plan dated January 2021 and attached hereto as Exhibit A pending approval from the Federal Emergency Management Agency.

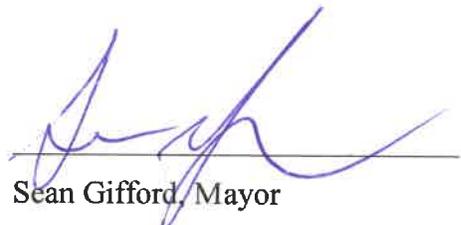
Dated this 12th day of January 2021.

ATTEST



Crystal Turner, City Clerk

CITY OF THREE FORKS



Sean Gifford, Mayor

Resolution No. 751

RESOLUTION APPROVING GALLATIN COUNTY HAZARD MITIGATION AND COMMUNITY WILDFIRE PROTECTION PLAN FOR TOWN OF WEST YELLOWSTONE, MONTANA

This Resolution was introduced by Patrick Lonergan, Emergency Manager, moved by Travis Watt, and seconded by Greg Forsythe. The Resolution was adopted by a vote of 5 to 0 in favor.

WHEREAS, all citizens and property within the Town of West Yellowstone are at risk from a wide range of hazards such as, but not limited to, aviation accidents, bioterrorism, civil unrest, communicable disease, drought, earthquake, extended cold, flooding, ground transportation accidents, hazardous materials release, railroad accidents, severe thunderstorms, terrorism, tornadoes, utility outage, violence, volcano, wildfire, wind, and winter storms;

WHEREAS, the Town of West Yellowstone, pursuant to Section 322, Mitigation Planning, of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, enacted by Section 104 of the Disaster Mitigation Act of 2000 (P.L. 106-390) and the Interim Final Rule published in the Federal Registry on February 26, 2002 at 44 CFR Part 201, is required to have an approved Hazard Mitigation Plan in order to receive future federal disaster mitigation funds; and

WHEREAS, a Hazard Mitigation Plan will guide the Town of West Yellowstone in making decisions for pre-disaster and post-disaster mitigation projects.

WHEREAS, the Town of West Yellowstone, pursuant to the Healthy Forest Restoration Act of 2003 is encouraged to develop a Community Wildfire Protection Plan to help reduce the risk to wildfire loss and create healthy ecosystems.

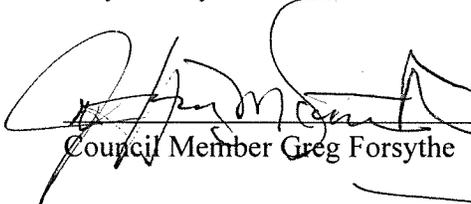
WHEREAS, a Community Wildfire Protection Plan will guide Town of West Yellowstone in making decisions for wildfire response and mitigation projects.

NOW, THEREFORE, it is hereby resolved that the Town Council for the Town of West Yellowstone does hereby adopt the Gallatin County Hazard Mitigation and Community Wildfire Protection Plan dated November 2020 and attached hereto as Exhibit A pending approval from the Federal Emergency Management Agency,

PASSED AND ADOPTED BY THE TOWN COUNCIL OF THE TOWN OF WEST YELLOWSTONE, MONTANA, THIS 29th DAY OF JANUARY 2021 AND APPROVED BY THE MAYOR OF THE TOWN OF WEST YELLOWSTONE.



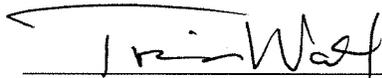
Mayor Jerry Johnson



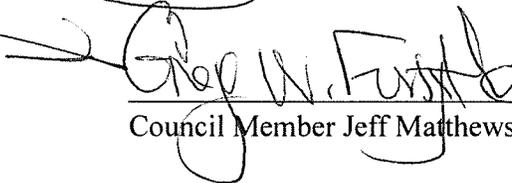
Council Member Greg Forsythe



Council Member Brad Schmier

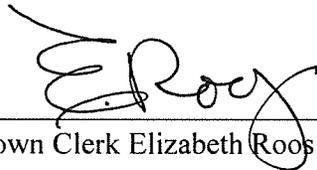


Council Member Travis Watt



Council Member Jeff Matthews

ATTEST:



Town Clerk Elizabeth Roos





ATTACHMENT 1

GALLATIN COUNTY COMMUNITY WILDFIRE
PROTECTION PLAN (CWPP) 2019 UPDATE



Community Wildfire Protection Plan Gallatin County, Montana



Photos courtesy: Gallatin County Emergency Management

PREPARED FOR

Gallatin County
311 W. Main Street
Bozeman, MT 59715

JUNE 2019

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LIST OF ACRONYMS

ACS	American Community Survey (US Census Bureau)
BLM	Bureau of Land Management
BP	Burn Probability
BTU	British Thermal Unit
BZC	Bozeman Interagency Dispatch Center
CFL	Conditional Flame Length
CFR	Code of Federal Regulations
CGNF	Custer-Gallatin National Forest
CWPP	Community Wildfire Protection Plan
DNRC	Department of Natural Resources and Conservation
ERC	Energy Release Component
FACLN	Fire Adapted Communities Learning Network
FEMA	Federal Emergency Management Agency
FLAME	Federal Land Assistance, Management, and Enhancement (Act, 2009)
HFI	Healthy Forests Initiative (2002)
HFRA	Healthy Forests Restoration Act (2013)
HMP	Hazard Mitigation Plan
MAC	Multi-Agency Coordinating Group
MCA	Montana Code Annotated
MSA	Metropolitan Statistical Area
NEPA	National Environmental Policy Act
NIFC	National Interagency Fire Center
NPS	National Park Service
NRCG	Northern Rockies Coordinating Group
NWCG	National Wildfire Coordinating Group
PSA	Predictive Service Area
PSAP	Public Safety Answering Point
RAWS	Remote Automated Weather Station
RMRS	Rocky Mountain Research Station
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USFS	United States Forest Service
USGS	United States Geological Survey
WFDSS	Wildland Fire Decision Support System
WRCC	Western Regional Climate Center
WUI	Wildland-Urban Interface

1 EXECUTIVE SUMMARY

Community Wildfire Protection Plans (CWPPs) are documents that are designed by a local group of stakeholders who are invested in the wildland fire threat to their area. The group of stakeholders typically consists of representatives from local fire districts; local, state, and federal land management agencies (e.g., U.S. Forest Service, National Park Service, Montana DNRC); and private property owners and managers. Each of these representatives bring different perspectives regarding strategies to manage and mitigate risks associated with wildland fire.

The Healthy Forests Restoration Act (HFRA) of 2003 provides incentives for federal agencies charged with forest and land management to collaborate with local communities as they develop hazardous fuel reduction projects. In turn, the HFRA provides communities an opportunity to influence where and how federal agencies implement fuel reduction projects on federal lands and how and where federal funds can be leveraged for projects on non-federal and private lands. The minimum requirements for a CWPP as described in the HFRA are:

- / A CWPP must be collaboratively developed by local and state government representatives, in consultation with federal agencies and other interested parties.
- / A CWPP must identify and prioritize areas for hazardous fuel reduction treatments and recommend the types and methods of treatment that will protect one or more at risk communities and essential infrastructure.
- / A CWPP must recommend measures that homeowners and communities can take to reduce the ignitability of structures throughout the area.

The HFRA also requires that three governing entities must mutually agree to the final contents of a CWPP:

- / Applicable local governments (i.e., Gallatin County, incorporated cities/towns);
- / Local fire departments, districts or fire service areas; and
- / The state agency responsible for forest management (i.e., Montana Dept. of Natural Resources and Conservation - DNRC).

The initial CWPP for Gallatin County was completed in 2006. The goals of the 2006 CWPP were to:

- / Protect life and human safety
- / Prevent or limit the loss of property
- / Restore and preserve our forest ecology

Significant informational products and recommendations included in the 2006 CWPP included:

- / Definition and delineation (mapping) of the Wildland-Urban Interface (WUI)
- / Development of a WUI Risk Analysis Model
- / Ongoing review and update of subdivision regulations applicable to WUI areas and risks
- / Increased public education and outreach regarding the CWPP and WUI planning
- / Identification, planning and development of mitigation projects on private property

In the dozen years since completion of the 2006 CWPP, the population in Gallatin County has continued to grow at a rapid rate. Construction of new homes and housing subdivisions, roads, and other infrastructure, some of which has occurred in WUI areas, plays a significant role in how communities plan for wildland fire including prioritization of actions to mitigate risk. This update to the Gallatin County CWPP expands on the information and mapping contained in the 2006 plan and provides more detailed spatial analyses of relative wildfire probability, intensity and overall hazard or risk across the county. Specific items of note within this 2018 CWPP update include:

- / Refined definition of the wildland-urban interface (WUI) for Gallatin County;
- / An updated risk and hazard assessment;
- / New action table and maintenance plan;
- / Refreshed content to align with national policy and strategies.

This update was collaboratively developed by many stakeholders representing different areas of expertise and perspectives. Upon adoption of this CWPP update, stakeholders — including the public — are ready to launch into the critical phase of implementation to ensure that Gallatin County increases its capacity for resilient landscapes, fire adapted communities, and efficient response capabilities.

2 INTRODUCTION

The concept of community-based forest planning and management is neither novel nor new. Gallatin County communities and residents have been reminded by several recent wildfires of the need to engage in comprehensive forest planning and prioritization. These fires have included the Flaming Arrow fire (2009) in Bridger Canyon, the Bear Trap fire (2012) along the Madison River, the Bean Canyon Fire (2012) west of Maudlow, the Millie fire (2012) in the Storm Castle Creek drainage southwest of Bozeman, the Cottonwood Gulch (2015)



Photo Credit: ABC/FOX Montana

The Horseshoe Fire burns east of Clarkston on the afternoon of Sept. 10, 2018.

and Horseshoe (2018) fires in the Clarkston-Horseshoe Hills area, the Maple fire (2016) in the northwest corner of Yellowstone National Park, and the Bacon Rind fire (2018) within the Custer-Gallatin National Forest and Yellowstone National Park, along Highway 191 south of Big Sky. This document includes a review of Gallatin County's past fire history and describes current conditions and status of human development that affect fire probability, severity, and risk. This plan addresses risks to health, safety and property, and provides a comprehensive strategy to improve resiliency to wildfire.

2.1 PURPOSE

The purpose of the Gallatin County CWPP is to accomplish the following goals:

- / Protect lives and property from wildland fires
- / Foster personal responsibility for taking preventive actions regarding wildland fire
- / Improve public understanding of the risks associated with living in a fire-adapted ecosystem
- / Increase the community's ability to prepare for, respond to, and recover from wildland fires
- / Restore fire-adapted ecosystems
- / Create and maintain fire-adapted communities
- / Improve fire resilience of the landscape while protection other social, economic, and ecological values

2.2 MISSION

The overall **mission** of the Gallatin County CWPP is ***to protect against loss of life, property, and natural resources as the result of wildland fire***. The CWPP is structured to accomplish this mission and it continues to serve as a leading document in providing direction and guidance to persons seeking to protect both the human and natural resources within Gallatin County.

Wildland fire is a natural and necessary component of forest ecosystems across the country. Southwest Montana is no exception. Historically, wildland fires have shaped the forests valued by residents and visitors. Forests and other wildlands in Gallatin County, however, are now significantly altered due to past forest management practices, fire prevention efforts, modern fire suppression activities, residential development, and a general lack of large-scale fires. These activities have resulted in overgrown forests—some with closed canopies and all with abundant ladder fuels that dramatically increase the chances of large wildland fires that burn intensely and cause catastrophic losses.

Gallatin County has experienced high rates of population growth and home building within the last 20 years, which has led to increased residential development into forested areas and other wildlands, creating more wildland-urban interface/intermix (WUI) areas. A resulting increase in risk to life and property presents a challenge for fire protection, fire prevention, and law enforcement agencies.

While reducing and managing risk of high-intensity wildfire is a primary purpose of this plan, prescribed forest and wildland management for hazardous fuels reduction and fire resilience is only one objective. Residents and visitors desire healthy, fire-resilient forests and wildlands that provide habitat for wildlife, recreational opportunities, and scenic beauty. By establishing more fire-adapted communities that integrate efforts on both public and private property, overall fire-resiliency of the landscape improves, along with fire response outcomes that are more predictable and successful.

This CWPP update outlines the revised priorities, strategies, and action plan for fuels reduction treatments in the WUI and post-fire recovery. Recommendations are provided for reducing structural vulnerability and creating defensible spaces in communities and other areas at risk. With this revision, the Gallatin County CWPP delivers current information and methodologies for fuels reduction, education, and other projects to decrease the overall risk of loss from wildland fire. This is a “living” document, to be updated periodically to reflect new data, proposed projects and landscape management techniques.

2.3 RECENT FEDERAL INITIATIVES AND LEGISLATION

The Healthy Forests Initiative (HFI) was established by the federal government in 2002 to improve regulatory processes and ensure more timely decisions, greater efficiency, and better results in reducing the risk of high-intensity wildfire. This initiative allowed forest management agencies, for the first time, to expedite the documentation process for reducing hazardous fuels on public lands.

The U.S. Congress passed historical, bi-partisan legislation, The Healthy Forests Restoration Act (HFRA), in 2003. This legislation expands the initial effort under the HFI and directs federal agencies to collaborate with communities in developing CWPPs which include the identification and prioritization of areas needing hazardous fuels treatment. It further provides opportunities and authority for federal agencies to expedite the National Environmental Policy Act (NEPA) process for fuels reduction projects on federal lands. The act also requires that 50% of funding allocated to fuels projects be used in the WUI.

The development and implementation of this CWPP gives the communities of Gallatin County the opportunity to participate in determining where federal agencies place their fuels reduction efforts. With a CWPP in place, Gallatin County, community groups, and other stakeholders can apply for federal grants

to treat hazardous fuels and address special concerns to reduce the risk of catastrophic loss as a result of wildland fire.

Congress passed the Federal Land Assistance, Management, and Enhancement (FLAME) Act in 2009 and called for a National Cohesive Wildland Fire Management Strategy (Cohesive Strategy) to address wildland fire-related issues across the nation in a collaborative, cohesive manner. The Cohesive Strategy was finalized in 2014 and represents the evolution of a national fire policy:

- / To safely and effectively extinguish fire, when needed; use fire where allowable; manage our natural resources; and, as a Nation, live with wildland fire
- / The primary, national goals identified as necessary to achieving the vision are:
 - » **Resilient Landscapes:** Landscapes across all jurisdictions are resilient to fire-related disturbances in accordance with management objectives.
 - » **Fire-Adapted Communities:** Human populations and infrastructure can withstand a wildfire without loss of life and property.
 - » **Wildfire Response:** All jurisdictions participate in making and implementing safe, effective, efficient, risk-based wildfire management decisions.

2.4 RELATIONSHIPS TO OTHER PLANS, POLICIES, AND REGULATIONS

This CWPP includes compatibility with Federal Emergency Management Agency (FEMA) requirements for a Hazard Mitigation Plan (HMP), while also adhering to the guidelines proposed in the National Fire Plan, and HFRA. This CWPP has been prepared in compliance with:

- / The National Fire Plan: A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment, 10-Year Comprehensive Strategy Implementation Plan (USDA 2006)
- / HFRA
- / FEMA Region 8 guidelines for a Local Hazard Mitigation Plan as defined in 44 Code of Federal Regulations (CFR) Parts 201 and 206, and as related to a fire mitigation plan chapter of a Multi-Hazard Mitigation Plan
- / National Association of State Foresters: Guidance on identification and prioritizing of treatments between communities (2003). The objective of combining these complementary guidelines is to facilitate an integrated wildland fire risk assessment, identify pre-hazard mitigation activities, and prioritize activities and efforts to achieve the protection of people, structures, the environment, and significant infrastructure in Gallatin County while facilitating new opportunities for pre-disaster mitigation funding and cooperation.

Building a collaborative and cooperative environment with the local fire districts, community-based organizations, local governments, and the public land management agencies has been the first step in reducing the risk of loss from wildland fire. The importance of collaboration with neighboring counties and jurisdictions and understanding goals of their CWPPs is recognized by Gallatin County and is referenced throughout this CWPP as documentation of collaborative efforts to maximize hazardous fuels reduction efforts in the area.

Several local plans, policies and regulations are referenced within this CWPP update. This locally based guidance and information was used in development of the CWPP to ensure that consistent and cohesive wildfire management and mitigation strategies are presented. The most frequently referenced plans and policy documents include:

Gallatin County Hazard Mitigation Plan (HMP)

The 2018 update to the Gallatin County HMP is being completed in tandem with the CWPP update. The CWPP will become an *Attachment* to the updated HMP. Information on population trends, critical facilities and infrastructure, housing stock, and land use are incorporated into the CWPP. **Wildfire** is identified as a high-priority hazard in the HMP and data regarding wildfire history, risk, and vulnerability are presented. The mitigation strategy in the HMP includes goals and objectives aimed at preventing losses from wildfires and reducing wildfire risk within the WUI.

Growth Policies and Regulations

The Gallatin County Growth Policy (and accompanying Resource Documents) was adopted in April 2003 as the document intended to help guide future growth and land development in the county. It is the community's hope, and the County's commitment, that growth occur in a coordinated, logical, and cost-effective manner that minimizes unplanned, costly sprawl. The growth policy is used to guide land use decisions, and decisions relative to the provision of public facilities and services as well as the conservation and protection of environmentally sensitive lands. The County is currently engaged in an update of the Growth Policy with an expected completion date of 2021.

The City of Bozeman's Community Plan (Growth Policy) was adopted in June 2009. The Plan defines the city's goals and objectives for growth, provides maps and text that describe the characteristics and features of jurisdictional areas, and presents a timetable for implementing elements within the growth policy. Chapter 13 of the plan discusses the city's planning efforts for disaster prevention and response, with wildfire listed as one of the natural hazards present in the Bozeman area. The Community Plan is currently being updated with completion anticipated in 2019.

Other long-range growth and planning policy and study documents include the Belgrade Growth Policy (2006) and the Gallatin Triangle Planning Study (Sanderson Stewart, 2014), which includes recommendations for regional planning cooperation between Gallatin County and the cities of Belgrade and Bozeman. The City of Bozeman has also recently completed (April 2019) a Climate Vulnerability Assessment and Resiliency Strategy document which aims to guide the City in its preparations for the effects of climate change and build resilience in delivering services to its residents.

Subdivision and zoning regulations at both the county and municipal (Belgrade, Bozeman) levels provide additional tools for potential future implementation of risk reduction actions presented in this CWPP.

Other Local CWPPs

The purpose of this CWPP is to complement other local CWPPs that may be prepared by jurisdictions with the county (e.g., cities, towns, fire districts, homeowner's associations), or by adjacent counties including Broadwater, Madison, Meagher and Park. CWPPs prepared at different scales can prioritize risk mitigation activities that are focused on specific areas.

2.5 CWPP UPDATE PROCESS

The current Gallatin County CWPP was completed in 2006. Continued efforts have been made by local, state, and federal agencies to reduce the threat of high-intensity wildland fires through landowner education as well as fuels reduction activities on both public and private lands. In addition, private landowners have responded enthusiastically to community defensible space initiatives and recommendations to reduce hazardous fuels on their own properties.

Preparation of a CWPP follows a three-step process of development, adoption, and implementation:

- / During development, communication is initiated between resource agencies, local community representatives, private organizations and other stakeholders to discuss and mutually agree on wildfire risk reduction goals and strategies.
- / The adopted plan provides an informative and action-oriented framework to guide implementation of mitigation actions and projects.
- / Through ongoing and long-term actions, stakeholders work to achieve the goals set forth in the CWPP and suggest adjustments to improve actions, when necessary.



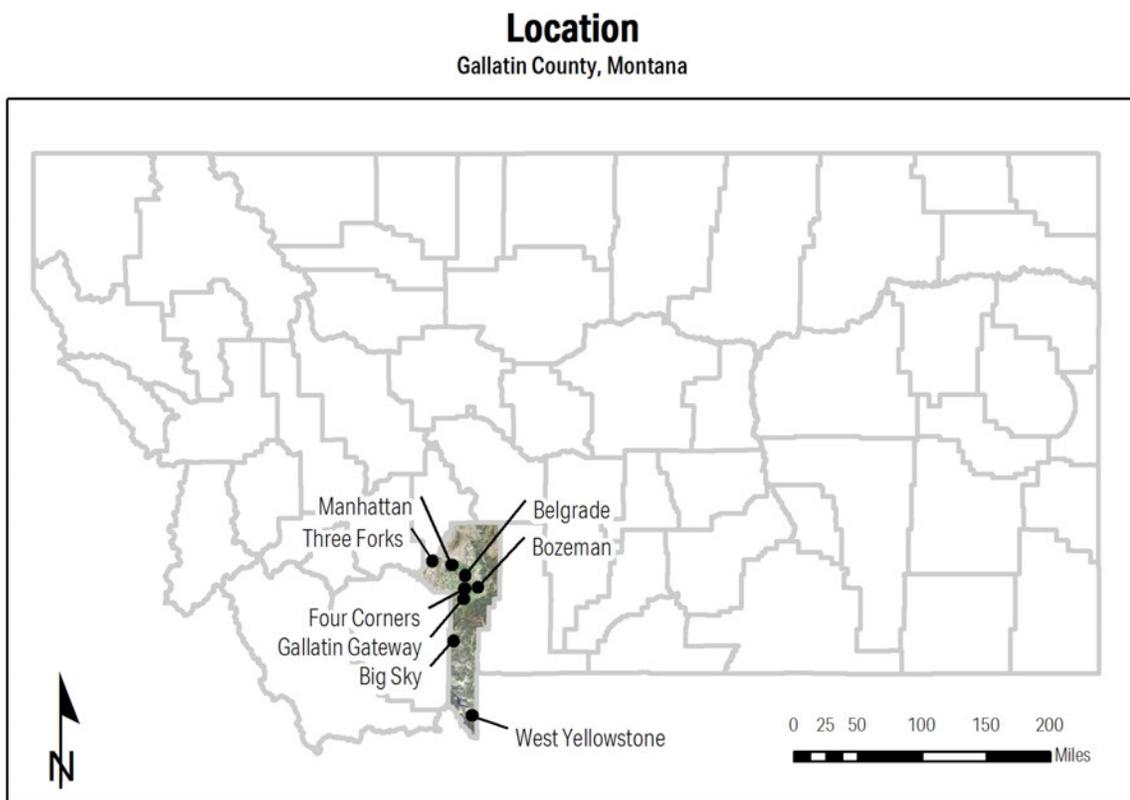
Photo Credit: M. Rotar

West Yellowstone, Montana looking to the east into Yellowstone National Park.

3 GALLATIN COUNTY LOCAL ENVIRONMENT

3.1 OVERVIEW

Gallatin County is located in southwest Montana as shown in **Figure 1**, with an area of approximately 2,631 square miles and elevations ranging from approximately 4,000 to 10,700 feet. Gallatin County is bordered by Meagher County to the northeast, Park County to the east, Jefferson and Broadwater Counties to the northwest, Madison County to the southwest, and Yellowstone National Park and the state of Wyoming to the southeast. The state of Idaho borders the far southwest corner of Gallatin County. The City of Bozeman is the county seat and largest city. Other incorporated communities include the cities of Belgrade and Three Forks, and the Towns of Manhattan and West Yellowstone. The communities of Big Sky, Four Corners, and Gallatin Gateway and Willow Creek represent other population centers.



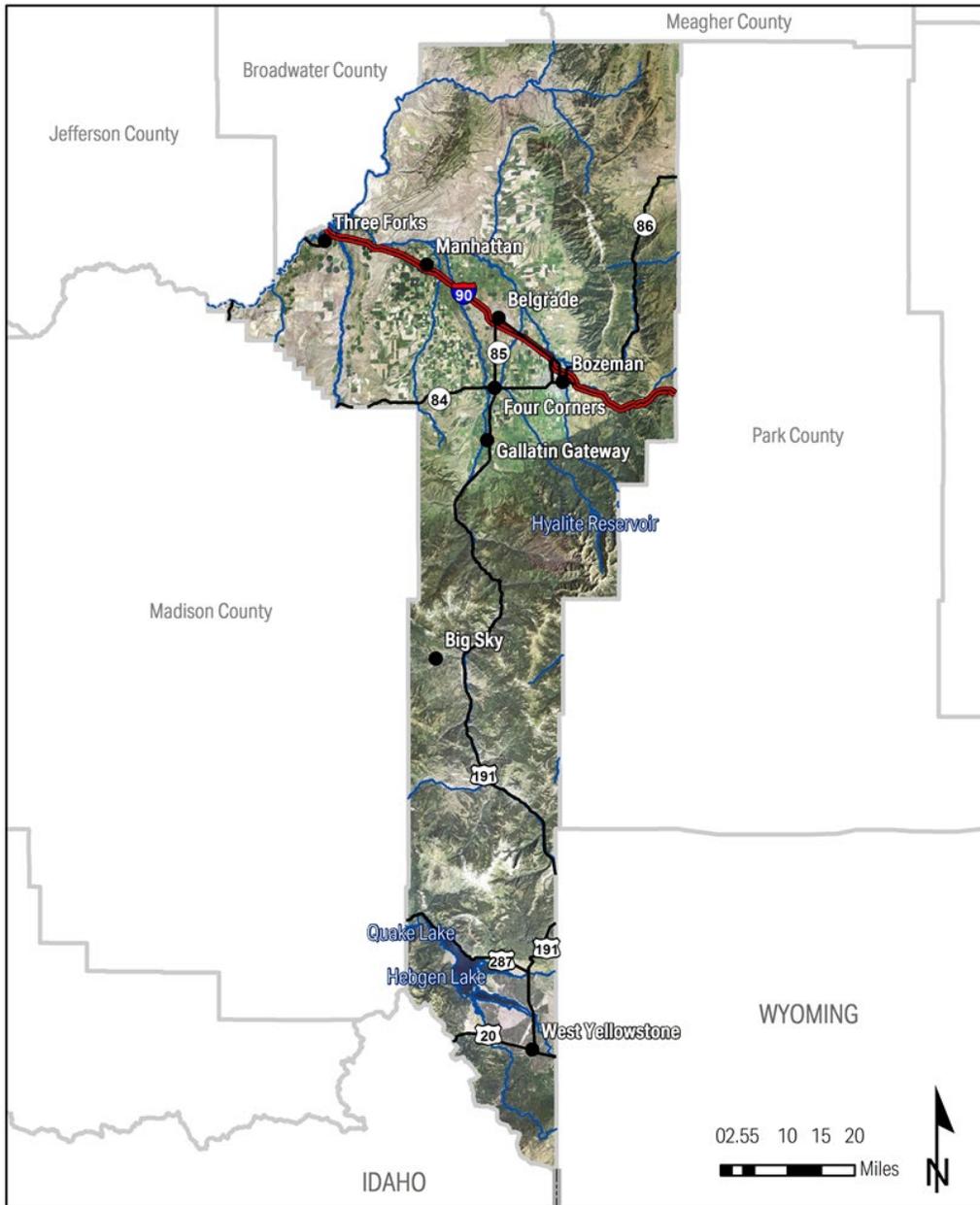
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Map Coordinates: NAD 1983, State Plane Montana

Figure 3-1. Gallatin County Location

Figure 2 shows the general features in the county. The Gallatin Valley is a dominant feature in the northern portion of the county, bisected south to north by the Gallatin River and covering a land area of approximately 400 square miles. The valley is bordered by the Bridger Mountain range to the northeast, the Gallatin Mountains to the south and the Horseshoe Hills to the north. The Madison and Jefferson River valleys occupy the western extent of the county, with the three rivers (Gallatin, Jefferson, Madison) meeting northeast of Three Forks to form the headwaters of the Missouri River. The southern portion of

the county is dominated by the Gallatin River drainage and canyon running from south to north. Peaks of the Gallatin Range are located on either side of the canyon. At the far southern end of the county, the Madison River enters the county from the east and Yellowstone National Park, flowing into Hebgen Lake and then Quake Lake. The Town of West Yellowstone is located at the southern end of the county and is adjacent to one of the four main entrances to Yellowstone Park.

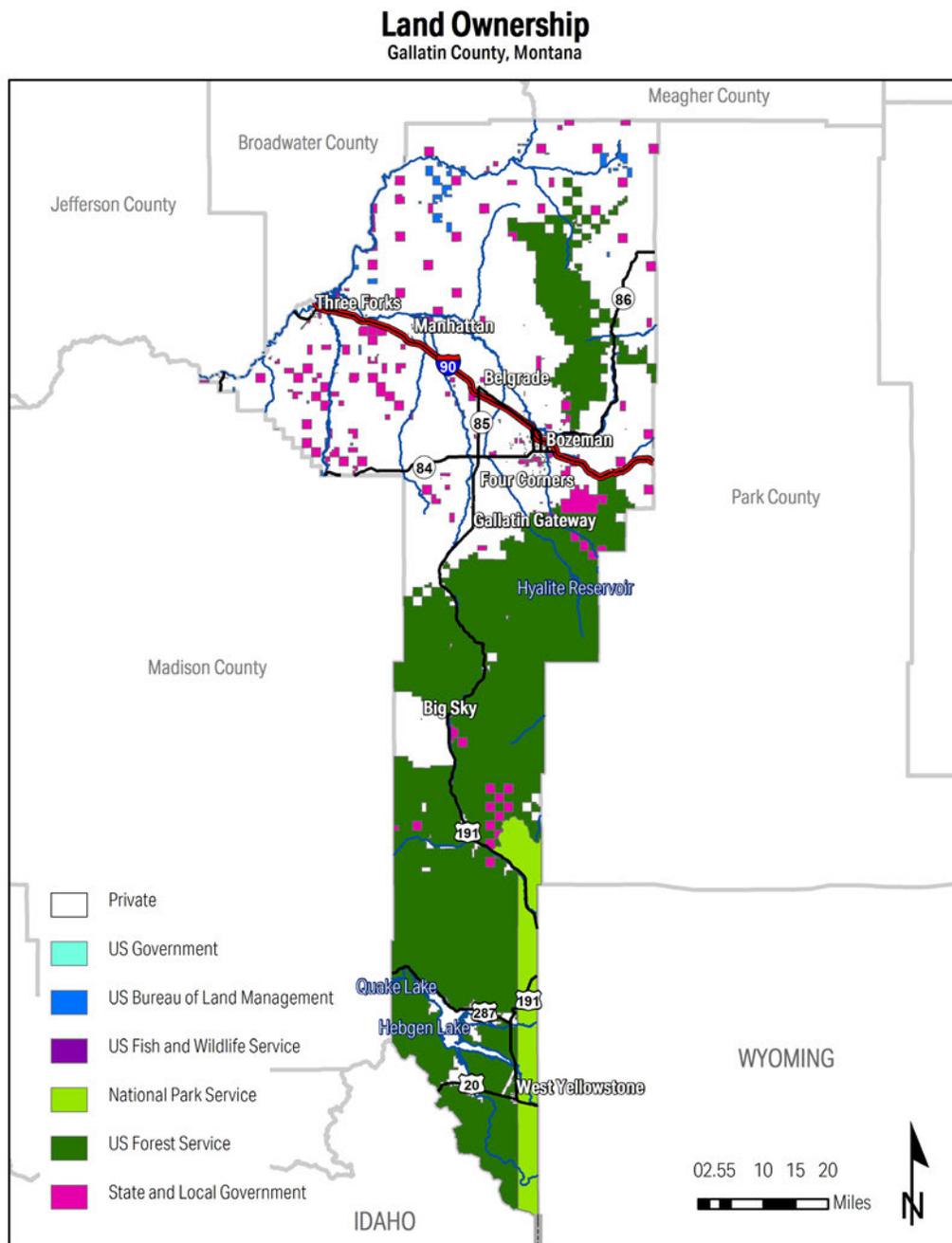
Features
Gallatin County, MT



Data Source: Montana NRIS
Data Date: August 2017
Mapp Coordinates: NAD 1983, State Plane Montana

Figure 3-2. Gallatin County Features

Gallatin County has varied land use, with nearly half of the land area under public ownership by the U.S. Forest Service, State of Montana, Bureau of Land Management (BLM) or the National Park Service. Both urban and rural communities are present, with individual residences and farms interspersed. Significant population growth and accompanying land development is occurring in several areas within the **Figure 3-3** shows the land ownership in the county.



Data Source: Montana NRIS
 Data Date: August 2017
 Mapp Coordinates: NAD 1983, State Plane Montana

Figure 3-3. Gallatin County Land Ownership

3.2 DEMOGRAPHICS

Gallatin County, and particularly the City of Bozeman, is growing rapidly. Between 2000 and 2018, the county’s population increased by almost 65% from 67,831 to 111,876 (U.S. Census Bureau, 2018). This represents an average annual growth rate of 2.8%. In 2018, the City of Bozeman was ranked as the fastest growing micropolitan area (cities under 50,000 population) in the U.S. (POLICOM, 2018). Bozeman’s estimated population in 2018 is 48,532 (U.S. Census Bureau, 2018), and by 2020 it is expected the population will eclipse 50,000, thus making the city and a large portion of Gallatin County the state’s fourth Metropolitan Statistical Area (MSA). The other incorporated communities in Gallatin County include: Belgrade (2018 pop. est. 8,993), Manhattan (2018 pop. est. 1,822), Three Forks (2018 pop. est. 2,053), and West Yellowstone (2018 pop. est. 1,382). Other census-designated places in the county include Big Sky (pop. 2,904, 2017 ACS 5-yr population est.), Gallatin Gateway-Four Corners (pop. 4,943, 2017 ACS 5-yr population est.), and Willow Creek (pop. 207, ACS 5-yr population est.). **Table 3-1** provides a snapshot of several key demographics within Gallatin County.

Table 3-1. Overview of Key Demographics in Gallatin County, Montana.

Demographic	Magnitude / Quantity of Key Statistic	Notes
Population (2018 est. ¹)	111,876 residents	Population has increased by 22,363 residents (25%) since 2010
Projected Population (2040 est. ²)	122,432 – 177,477 residents	A steady increase in population is forecast through 2040, however estimates vary considerably based on different modeling scenarios, which is to be expected as future population trends are estimations at best
Population Density	43 persons / square mile	Average population density for Montana is 6.8 persons per square mile ³
Median Age ⁴	33.4 years	
Total Number of Housing Units ⁵	51,011 units	
Median Household Income ⁵	\$59,397	
Workforce Employment (2016) ⁵	45,778 persons	
Poverty Rate ⁴	13.0%	

¹ U.S. Census Bureau Data, population estimate July 1, 2018.

² MT Dept. of Commerce, Census and Economic Information Center (sourced by eREMI) – low projection; Belgrade Long-Range Transportation Plan (sourced by Woods and Poole Economics) – high projection.

³ 2018 Economic Profile – Population Trends, Prospera Business Network, Bozeman.

⁴ U.S. Census Bureau, 2013-2017 American Community Survey (ACS).

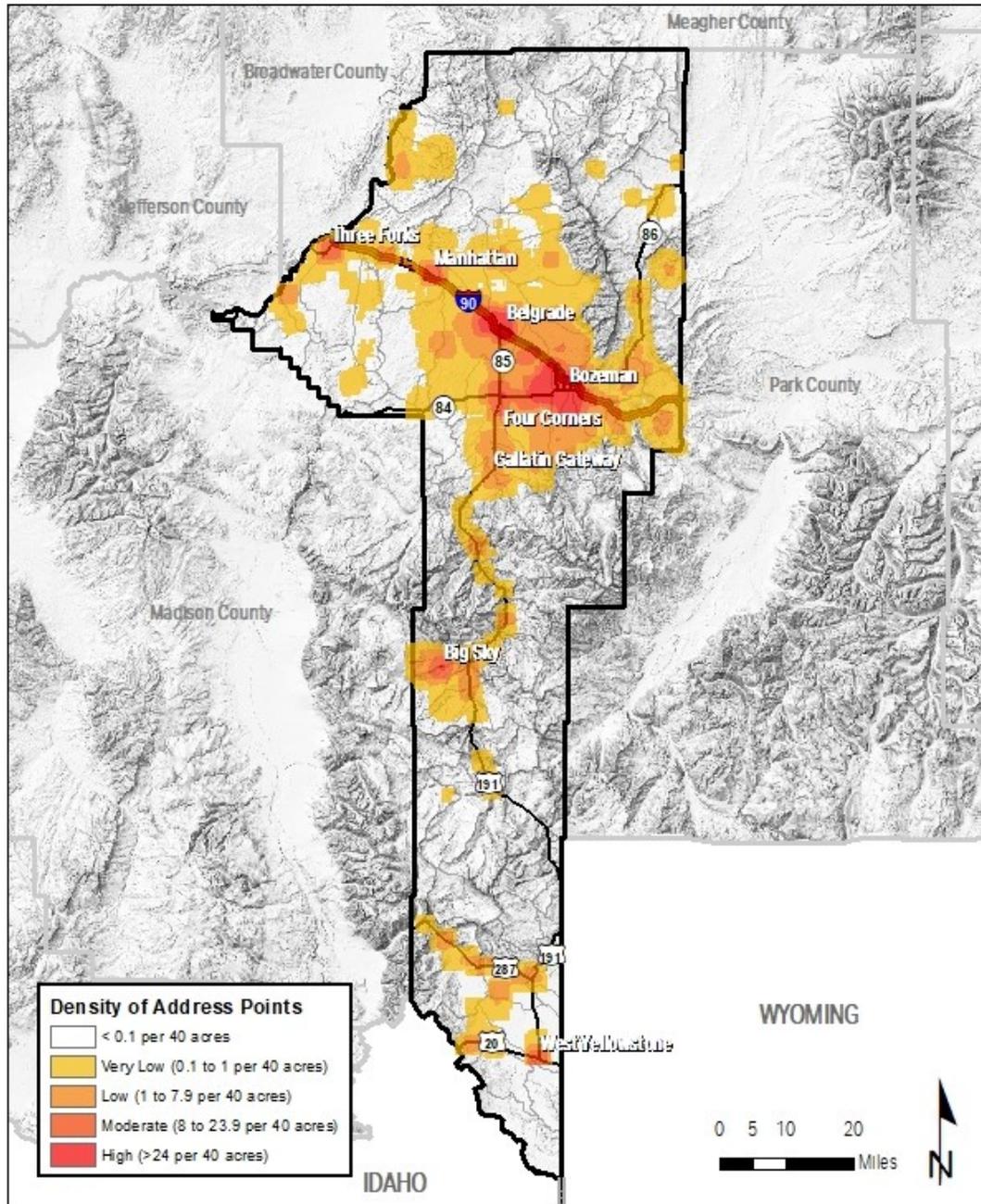
⁵ U.S. Census Bureau, QuickFacts, July 1, 2018 (site accessed 5/28/2019).

While Gallatin County’s population density is substantially greater than the average population density in Montana, it varies widely across the county. The City of Bozeman’s population density was 1,950 persons per square mile in 2010 (U.S. Census, 2018). Outside of Bozeman and the county’s other incorporated cities and towns, and census-designated places, the average population density in the county is approximately 13 persons per square mile.

Figure 3-4 illustrates the distribution of structure density patterns across the county (based on address point data). Structure density can be used as a surrogate to represent population density given the strong correlation between population and the built environment.

Structure Density

Gallatin County, Montana



Data Source: Montana NRIS
 Data Date: August 2017
 Map Coordinates: NAD 1983, State Plane Montana

Map Updated by:
 Troy Benn
 December 2018



Figure 3-4. Gallatin County Structure Density.

3.3 CRITICAL INFRASTRUCTURE

Critical Infrastructure is a critical component of planning for, and responding to, wildfires in Gallatin County. By default, utility distribution systems, communications infrastructure, watersheds, primary egress routes and other human-made attributes that prevent their failure, are critical to the continued operation of the community and considered critical infrastructure. This plan captures and identifies some, but not all critical infrastructure. This is because some critical infrastructure's details are considered sensitive and not for public distribution, while accurate and complete data may not exist for other infrastructure. We also recognize that new infrastructure is continually being added and may not be captured until the next update of this plan. Regardless of whether a specific piece of human-made infrastructure is listed in this plan, if its continued operation is vital to the continuity and/or safety of our community, it should be considered critical infrastructure and treated as such in mitigation, planning and response activities.

The Community recognizes the importance of mapping as much critical infrastructure as possible and the important relationship it plays in connection to our mapped Wildland-Urban Interface. The County intends to develop a Critical Infrastructure Wildland-Urban Interface layer to be utilized in conjunction with the other mapped Wildland-Urban Interface areas. Implementation of this Critical Infrastructure WUI layer was not able to be completed prior to initiation of the State and Federal review process of this Plan. The County intends to add this data layer prior to the final adoption process.

3.4 CLIMATE AND TEMPERATURE

The Gallatin Valley, which occupies a substantial portion of the northern half of Gallatin County, experiences a dry continental climate. A gradient of average annual precipitation extends from west to east across the valley, with Three Forks at the west end receiving an average of 12 inches per year, and the foothills along the Bridger and Gallatin Mountains at the east and south end of the valley receiving an average of up to 25 inches of precipitation. The fertile soils of the valley are very conducive to agricultural production, and indeed the principal economic driver as the valley was settled in the 1860s was agriculture. This continues to the present, although light industry, recreation and tourism have steadily increased over the last century, reducing the footprint that agriculture has on the valley today. Beyond the Gallatin Valley, the county is dominated primarily by higher elevation mountain ranges and smaller intervening valleys. The Horseshoe Hills in the far northwest area of the county is characterized by a steppe environment. The higher, mountainous areas range from the montane, through subalpine to alpine ecosystems. As expected, these higher elevation areas are substantially cooler than the valley floors and receive significantly greater amounts of precipitation, primarily as snow during the winter season. **Table 3-2** (Western Regional Climate Center, 2017) provides a summary of climatic data for Gallatin County.

Table 3-2. Gallatin County Climate Statistics.

	Montana State University 1982-2016	Belgrade (Bozeman Yellowstone Int'l Airport) 194-2016	Trident 1922-2016	West Yellowstone 1924-2013
Annual Average Daily Temp	55.2°F	56.0°F	60.2°F	50.3°F
Annual Average Monthly Temp.	31.2°F	28.2°F	32.0°F	19.6°F
Annual Average Total Precip	18.48 inches	13.92 inches	12.43 inches	21.56 inches
Annual Average Total Snow	86.0 inches	47.0 inches	28.5 inches	160.10 inches
Highest Temperature Recorded	105°F (7/31/1892)	106°F (7/6/2007)	109°F (7/22/1931)	97°F (7/19/1936)
Lowest Temperature Recorded	-43°F (2/8/1936)	-46°F (1/26/1957)	-55°F (12/31/1927)	-66°F (2/9/1933)
Annual Average Number of Days Dropping Below Freezing	181.7 days	199.3 days	172.2 days	270.7 days
Annual Average Number of Days Staying Below Freezing	48.0 days	51.9 days	33.6 days	87.8 days
Annual Average Number of Days Reaching 90 or Higher	7.4 days	19.8 days	31.3 days	2.2 days
Highest Annual Precipitation	25.57 in (1997)	20.04 in (1969)	20.96 in (1997)	29.32 in (1955)
Lowest Annual Precipitation	10.54 in (1934)	8.65 in (1961)	6.42 in (1974)	15.68 in (1934)
1-Day Maximum Precipitation	2.68 in (5/7/1988)	2.14 in (6/25/1969)	2.00 in (5/25/1980)	2.70 in (6/17/1925)
Highest Annual Snowfall	159.5 in (1975)	87.4 in (1955)	75.0 in (1989)	276.1 in (1994)

¹ Based on a calendar year, not a snowfall season.

3.4.1 Wind

Wind plays an important role in the fire environment and extent of fire spread across all landscapes found in Gallatin County. The prevailing winds that influence fire spread originate from the southwest, pushing fire movement in the northeasterly direction. During extreme weather events, the montane landscapes experience high, hot and dry winds originating from the easterly direction, which can cause unpredictable fire behavior situations. Strong winds are associated with cold fronts and thunderstorms, resulting in drastic, erratic shifts in wind direction and strong downdraft wind activity. Winds gust in excess of 40-70 mph are not uncommon with cold fronts and thunderstorms in this area.

3.5 VEGETATION

3.5.1 Fire Adapted Landscape

The forested areas in Gallatin County exhibit a variety of fire regimes, depending on forest type and elevation. Cycles of frequent, low-intensity fire could be found at the lowest elevations, while mid to high elevations exhibited less frequent fire at moderate to high intensity. Over a century of successful fire suppression activities and excessive fuels build-up has altered the historical fire regime intensity and severity, primarily in the lower to mid elevation forest types. The most recent forest assessment for the CGNF indicates a trend of more extreme disturbance events (large-scale fires) with longer durations due to anticipated warmer and drier climatic changes and increased horizontal and vertical fuel accumulations (USFS 2017).

3.5.1.1 Forest Vegetation

USFS Region 1 classification for existing vegetation includes dominance types, which represents broad species groups of dominant vegetation (Milburn et al. 2015, Reid et al. 2016). Dominance types are classified by broad groups of existing vegetation called Region 1 cover types. Unlike potential vegetation,

which is relatively static, cover type changes through time based on successional pathways and disturbances. Presence and distribution of cover types is important to understanding ecosystem diversity and function across the CGNF. The vegetation cover types that occur on the CGNF and representation within each analysis landscape are described in **Table 3-3** (from CGNF Forest Plan Revision, USFS 2017).

Forested areas tend to be on steeper terrain intermingled with grass and shrubs providing an abundance of ladder fuels which leads to horizontal and vertical fuel continuity. These factors, when combined with arid and windy conditions characteristic of the region, can result in high intensity fires with large flame length and fire brands that may spot long distances. Rates of fire spread tend to be lower than those in the grasslands; however, intensities can escalate dramatically, especially under the effect of slope and wind. Such fires present significant control issues for suppression resources and can result in large wildland fires.

Table 3-3. Forested and non-forested vegetation cover types.

Cover Type	Description
Non-Forested	Includes non-forest dominated cover types: grass, dry shrub, riparian grass/shrub. These are further defined and discussed in the non-forested assessment (Reid 2016).
Ponderosa Pine	This cover type includes sites dominated by ponderosa pine, juniper, or limber pine. A minor component of Douglas-fir can be present. Ponderosa pine is an early seral, shade intolerant, fire resistant species that is found on a narrow elevation band between non-forested ecotones and Douglas-fir. This type usually grows on the warm dry forested habitat type group, but also on hot dry and moderately warm and dry.
Dry Douglas-fir	Dry sites dominated by Douglas-fir, with potential components of ponderosa pine, limber, or juniper. Douglas-fir is one of the most common species on the montane landscapes of Gallatin County. It is moderately shade and drought-tolerant, which enables it to function as both an early and late seral species. This type occurs commonly on warm dry, moderately warm dry, and moderately warm moderately dry habitat type group.
Mixed Mesic Conifer	Sites dominated by Douglas-fir which can be mixed with lodgepole pine, and/or subalpine fir/spruce. This type is found on more moist and productive sites than the dry Douglas-fir type. This cover type is found most commonly on cool moderately dry to moist habitat type groups but can also occur on cool moist types or moderately warm moderately dry.
Lodgepole Pine	Sites dominated by lodgepole pine with minor components of other species. Lodgepole pine is a very abundant species on the montane landscapes of Gallatin County, growing under a wide range of conditions. Where dominant it is often single-storied. Without disturbance it succeeds to Douglas fir, spruce, and/or subalpine fir. This cover type can occur on multiple habitat type groups, most commonly cool moderately dry to moist.
Aspen/Hardwood	Areas dominated by aspen, cottonwood, and birch, often with shrubs such as willow and alder. This type often occurs in association with riparian and moist upland areas. Without disturbance, conifers will eventually dominate. This cover type can be found in almost all habitat type groups.
Spruce/fir	Subalpine fir and/or Engelmann spruce dominate, with minor components of other species. These are often climax forests. Where these shade-tolerant climax species have become dominant, stands are usually multilayered and dense. This cover type can occur on any of the habitat types in the broad cool moist or cold potential vegetation groups
Whitebark pine	The whitebark pine cover type occurs at the high elevations, commonly on the cold habitat type group (where it is perpetuated by disturbance) or timberline habitat type group (where it is the most dominant). Alpine larch is a potential component but is not known to occur in Gallatin County. Minor components of subalpine fir, spruce, Douglas-fir, limber pine, or lodgepole pine may occur. Whitebark is a shade intolerant, moderately fire-resistant species. Ongoing mortality due to the exotic blister rust fungus has reduced its extent.

USFS 2017, Custer Gallatin National Forest, Forest Plan Revision Assessment, Final Fire Report, Prepared by J. Shea, February 2017.

Milburn et. al., 2015, USFS Region 1, Existing and Potential Vegetation Groupings used for Broad-level Analysis and Monitoring, Nov. 2015.

Reid et. al., 2016, Vegetation grouping for the CGNF Plan Revision and Metadata for Adjustments made to VMap, 2016.

3.5.1.2 Rangeland Vegetation (CGNF Forest Plan Revision, Non-forested Terrestrial Ecosystems Report, USFS 2017).

A variety of grasslands are associated moist (mesic) and drier (xeric) shrublands in varying patterns across the landscape. Mesic shrublands are often associated with coniferous forests and occur as large landscape patches on moister sites (e.g., northeast facing slopes) or in smaller patches in grasslands. Because of the moisture regime, these shrublands can be very productive and therefore favored by wildlife. Grasslands occur mostly on areas too dry to support trees, although a few are found on soils at mid to high elevations that are too wet during the growing season for tree growth. In the forest zone between the upper and lower timberline, areas dominated by shrubs, forbs and grasses typically include one or more of the following characteristics: convex or well-drained landforms, thin or poorly developed soils that usually are quite dry, and high winds. Fires or landslides open-up the forests in some areas, allowing early successional herbaceous and shrubby stages to flourish for a time. Above treeline in the alpine zone, the climate is too severe for trees. Grass cover type is estimated to be about 11 to 32 percent of the montane units using Region 1 existing vegetation database data. Shrublands have deeper, more developed soils and more available moisture. In the montane units, shrublands are mostly dominated by mountain big sagebrush (*Artemisia tridentata vaseyana*) with some lower elevations dominated by Wyoming big sagebrush (*Artemisia tridentata wyomingensis*). Bitterbrush (*Purshia tridentata*) is found on the Hebgen Lake unit on mid to lower slope positions of south and west-facing exposures. Shrubby cinquefoil is found in moist sagebrush communities and occasionally on the fringes of wet or moist meadows at higher elevations. Willow-dominated shrublands (*Salix* spp.) are common in riparian areas and wet meadows.

Mountain big sagebrush generally occupies open dry sites at elevations below montane forests where winters are cold and dry, spring and early summer months receive most precipitation, and drier conditions are expected from mid-summer through the fall (Welch 2005). Sagebrush steppe vegetation, dominated by mountain big sagebrush, is also characterized by the presence of native forbs and cool season perennial bunch grasses (for example, *Agropyron*, *Festuca*, *Koeleria*, *Poa*, *Stipa*). Without periodic fire, sagebrush reaches an uncharacteristic old-growth form with increased height, woody stems, and thick accumulations of leaves – all highly flammable with fire behavior that is very similar to crown fires in larger conifers. Introduction of annuals, especially cheat grass, has increased fuel loads so that fire carries easily, increasing the potential for significant and dangerous fire behavior.

3.5.1.3 Noxious Weeds

Noxious weeds and cheat grass are found across Gallatin County and present yearly challenges for residents, agricultural users, and fire suppression agencies. Cheat grass, introduced invasive annuals and other noxious weeds typically occur where the ground has been disturbed to create roads, paths, or other plantings. Once established, they return perennially and can reach heights of three feet or more creating an easily ignitable fuel bed once they dry out during summer months. Fires that occur in this type of fuel spread quickly and can direct fire to other fuels such as trees or structures.

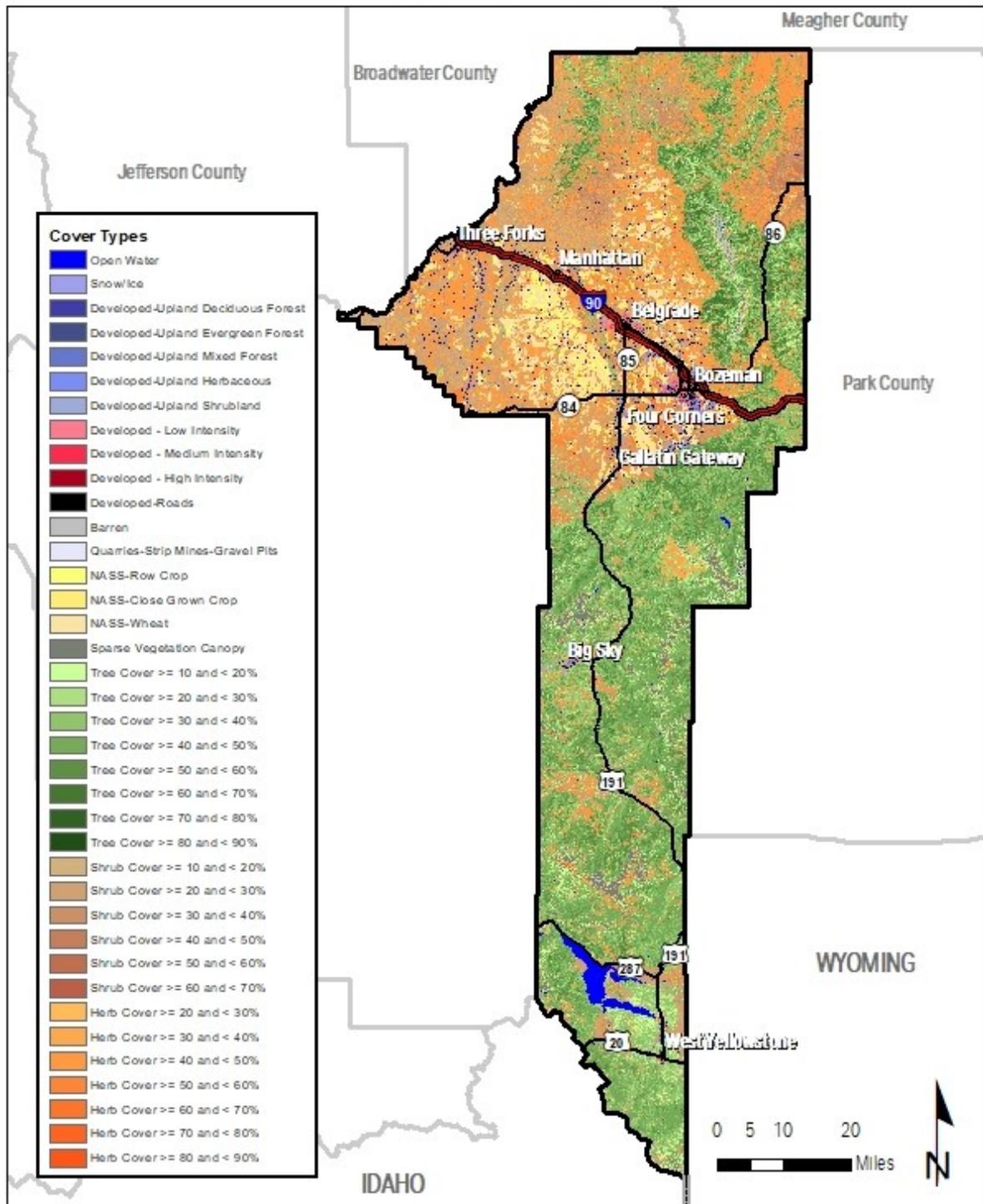
Cheatgrass provides a flammable link in the brush and forests vegetation types. It cures early in the fire season and ignites readily during dry periods because of its very fine structure that responds readily to changes in the atmospheric moisture, tendency to accumulate litter, and invasive nature. Cheatgrass promotes more frequent fires by increasing the biomass and horizontal continuity of fine fuels that persist during the summer lightning season. Its expansion has dramatically changed fire regimes and plant communities over vast areas of western rangelands by creating an environment where fires are easily ignited, spread rapidly, cover large areas, and occur frequently. Fire in these habitats can have severe effects on native species of plants and animals.

USFS 2017, Custer Gallatin National Forest, Forest Plan Revision Assessment, Final Non-forested Terrestrial Ecosystems Report, Prepared by Kim Reid, February 2017.

Welch, 2005, Getting Acquainted with Big Sagebrush, In: Big Sagebrush: A sea fragmented into lakes, ponds, and puddles. Gen. Tech. Report, RMRS-GTR-144. Fort Collins, CO: USDA-USFS Rocky Mountain Research Station: 1-46.

LANDFIRE Vegetative Cover

Gallatin County, Montana



Data Source: Wildland Fire Science, USGS
 Data Date: 2014
 Map Coordinates: NAD 1983, State Plane Montana

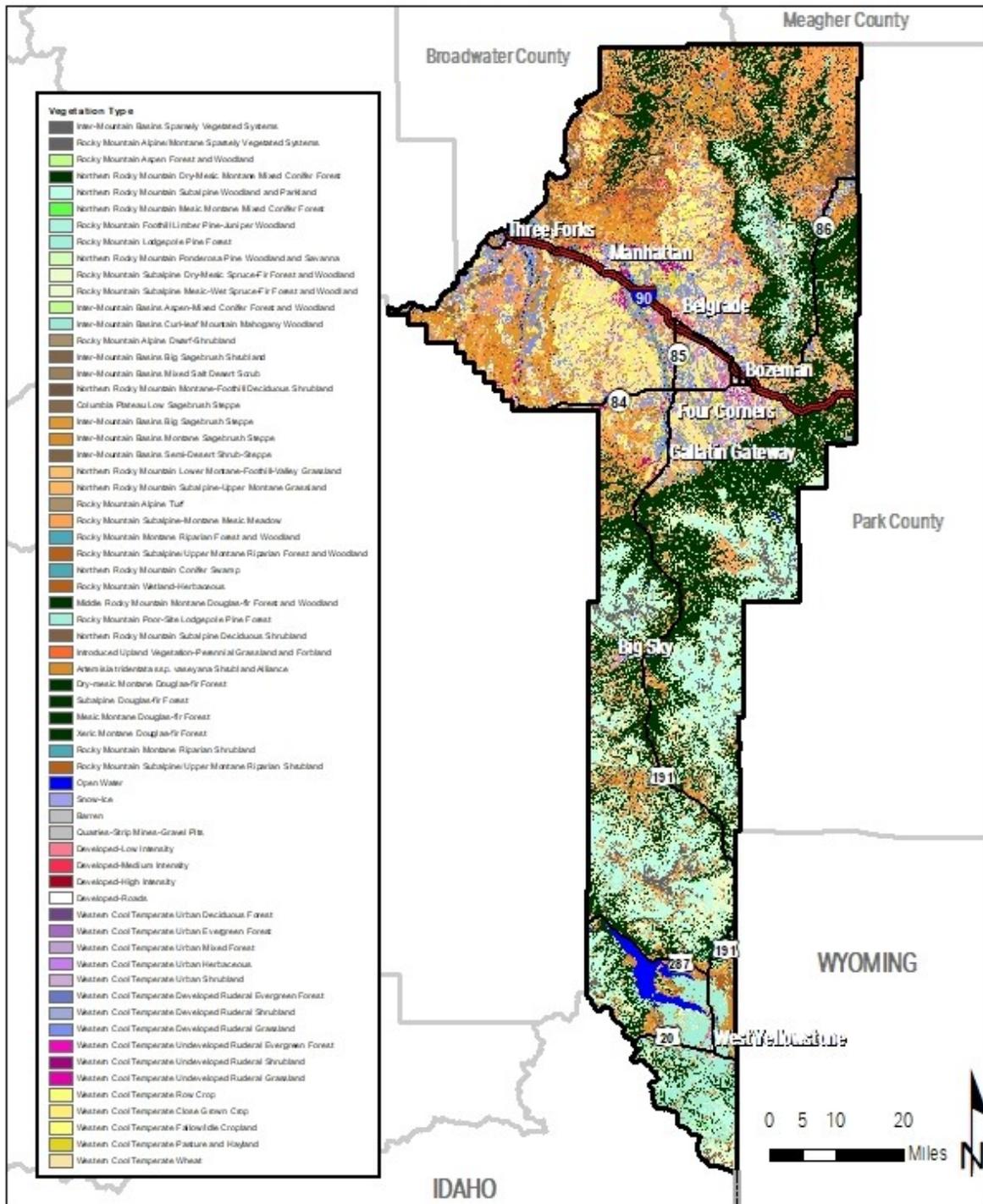
Map Updated by:
 Troy Benn
 December 2018



Figure 3-5. Vegetation Cover Map (LANDFIRE)

LANDFIRE Vegetation Type

Gallatin County, Montana



Data Source: Wildland Fire Science, USGS
 Data Date: 2014
 Map Coordinates: NAD 1983, State Plane Montana

Map Updated by:
 Troy Benn
 December 2018



Figure 3-6. Vegetation Type Map (LANDFIRE)

3.6 WILDLAND-URBAN INTERFACE

This 2018 Gallatin County CWPP update defines the concept of Wildland-Urban Interface (WUI) as:

“Any area where the combination of human development and vegetation have a potential to result in negative impacts from wildfire on the community.”

As a means of comparison, the 2017 Montana Code Annotated (MCA), Title 76. Land Resources and Use, Chapter 13. Timber Resources, Part 1. Protection of Forest Resources, has the following definition:

(16) *“The line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels.”*

and, the Gallatin County Subdivision Regulations (2014) include the following definition:

“An area where improved property and wildland fuels are both present.”

The formal definition of WUI is found in the Code of Federal Regulations (CFR) and describes conditions under which vegetation and structures meet or intermix. This definition uses levels of structure density or population density to subdivide WUI into Interface and Intermix categories. Interface refers to areas where structures directly border wildland fuels, but there is a clear line of demarcation between developed and wildland areas. Intermix refers to areas where structures are scattered throughout a wildland area. While the CFR guidelines for structure density are helpful, the definitions are still vague in terms of geographically defining WUI with a set of mappable criteria.

This CWPP generally adopts the approach used by the U.S. Forest Service in mapping WUI for the conterminous U.S. from 2010 U.S. Census data. Based on Federal Register definitions, this approach combines structure density data and landcover data depicting wildland vegetation to map the categories of WUI. For the Gallatin County WUI mapping, structure density was derived from county-level address point data, instead of structure density numbers at the census block polygon level used in the national mapping work. As a means of connecting WUI mapping to fire behavior modeling included in this CWPP, any areas mapped as having burnable wildland fuels for the purposes of modeling were considered to be wildland vegetation for the purposes of WUI.

An important difference between the WUI mapping criteria adopted in this CWPP and the criteria used for national WUI mapping is the use of a lower structure density threshold to define WUI. In the Federal Register and the national WUI mapping, areas must have at least 6.18 structures per square kilometer (1 per 40 acres) to be considered WUI. This leaves out sparsely populated areas with less than this density from the defined WUI area. As a conservative approximation of where future development could occur and recognizing that fire protection efforts are often undertaken for any structure regardless of density, the decision was made to include all areas with structure density greater than zero in the spatial definition of WUI for Gallatin County.

The spatial criteria for mapping WUI in this Gallatin County CWPP are:

1. **WUI Intermix** = Areas with structure density > 0, and \geq 50% cover of wildland vegetation within a 40-acre radius. These are places where structures and wildland vegetation are interspersed.
2. **WUI Interface** = Areas with structure density > 0, and < 50% cover of wildland vegetation within a 40-acre radius, located within 1.5 miles of a large, contiguous

area of wildland vegetation (i.e., > 1,235 acres with \geq 75% wildland vegetation). These are developed areas with less cover of natural vegetation, but within a distance where embers from wildfire in adjacent wildlands could cause wildfire impacts.

3. **Non-WUI Inhabited** = Areas with structure density > 0, and < 50% cover of wildland vegetation within a 40-acre radius, located further than 1.5 miles from a large, contiguous area of wildland vegetation. These are developed areas far enough from wildland vegetation that they have reduced likelihood of wildfire impacts.
4. **Non-WUI Uninhabited** = Areas with structure density = 0. These are areas with burnable fuels and no development.

A map of the WUI for Gallatin County based on these criteria is shown in **Figure 3-7**. The WUI map was completed by developing mapping for: (1) “at-risk communities”, as defined in the Federal Register based on structure densities, and applying methods developed by the SILVS lab (USFS – RMRS).

<https://www.federalregister.gov/documents/2001/01/04/01-52/urban-wildland-interface-communities-within-the-vicinity-of-federal-lands-that-are-at-high-risk-from>, and (2) the area surrounding the at-risk communities (using spatial criteria as defined above) <https://www.fs.fed.us/projects/hfi/field-guide/web/page22.php>. The total designated WUI area within Gallatin County (as shown on Figure 3-7) is 1,100,017 acres, of which 753,342 acres is Intermix, and 246,765 acres is Interface.

Additional high-value resources and assets that were included in the WUI mapping include the following:

1. Designated travel/egress routes with a 0.5-mile buffer on either side.
2. Other areas designated as “at-risk” (USFS-CGNF) including FS buildings, high-value recreation areas and communication sites. These assets were buffered in the same manner as the structure address points.
3. Municipal watersheds, including Bozeman, Lyman Springs and Whiskey Springs (West Yellowstone).

3.6.1 Wildland Urban Interface Planning Areas

The Gallatin County CWPP is multi-jurisdictional and addresses all lands and ownership within the boundaries of the plan area. Primary fire protection and suppression on the majority of private lands across the county are provided by local fire districts/service areas or Gallatin County Rural Fire (“County Fire”), which provides fire protection and suppression on most private lands outside of organized fire protection agencies, under a Cooperative Fire Control Agreement with the State of Montana ([“DNRC Co-op Plan”], Gallatin County, 2015) (**Figure 3-8** shows the jurisdictional boundaries for the 15 local fire districts/service areas within the county. Note that three fire jurisdictions extend outside of the county boundary (Big Sky, Three Forks, and Willow Creek). All federal lands (USFS-CGNF and Yellowstone National Park) are under wildfire protection from their respective agencies. In addition, USFS provides wildland fire protection on BLM lands (Montana Cooperative Fire Management and Stafford Act Response Agreement, 2011); and on state land on behalf of the DNRC, under an agreement known as protection offset. USFS also provides primary response/protection on some privately-owned forest parcels that are within a designated wildland fire protection district (pursuant to Title 76, Chapter 13, Part 2, MCA), and “Affidavit Land”, where wildland fire protection is requested by the landowner via assessment (USFS-CGNF, 2016). As the designated protecting agency, the USFS has primary wildland suppression responsibility on Affidavit lands; however, structure fire suppression remains the sole responsibility of DNRC, County Fire or local fire districts.

Gallatin County, 2015, Rural Fire Protection Operating Plan.

USFS-CGNF, 2016, Fire Management Plan, Chapter 4, pages 24-32.

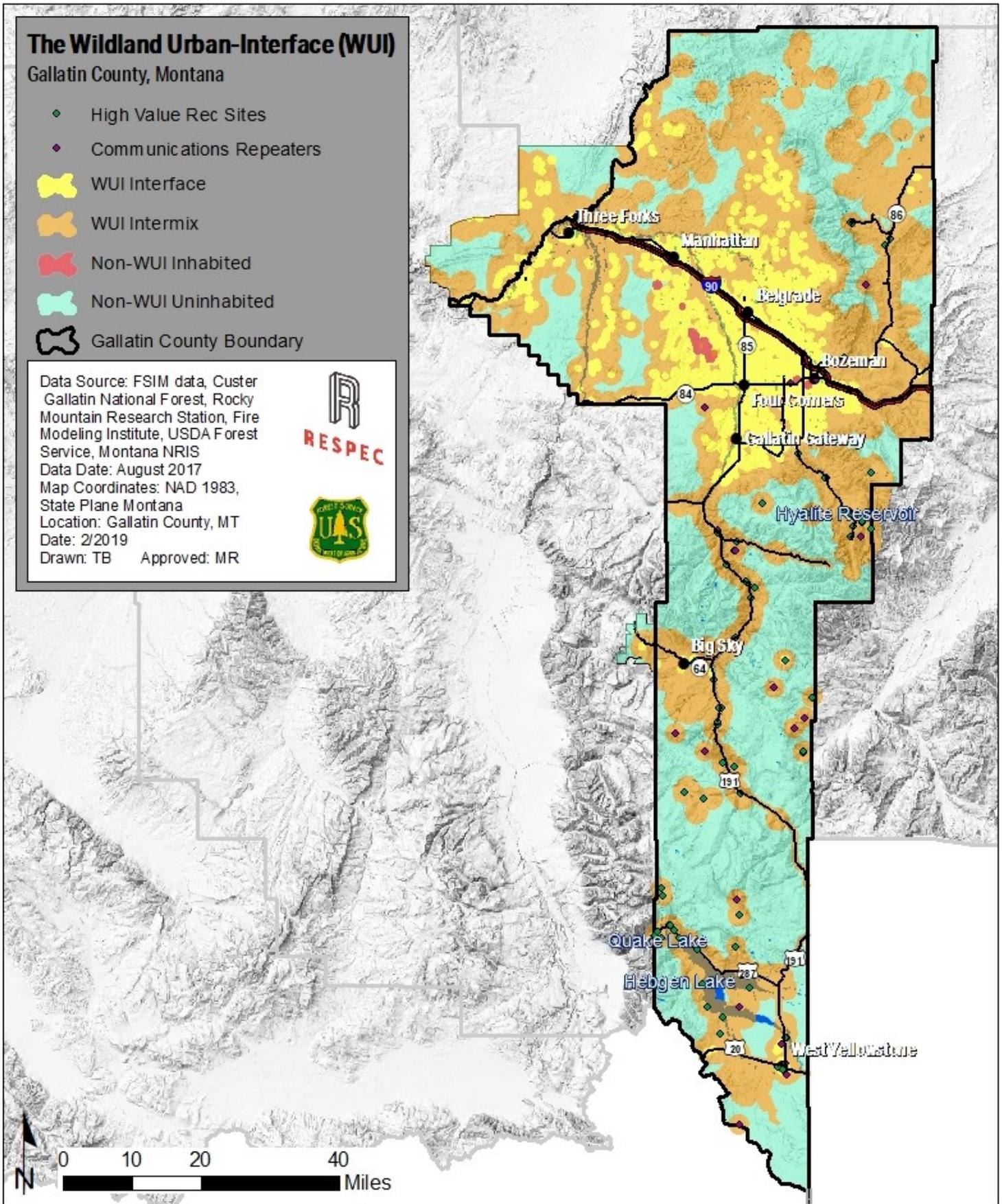


Figure 3-7. Gallatin County Wildland-Urban Interface

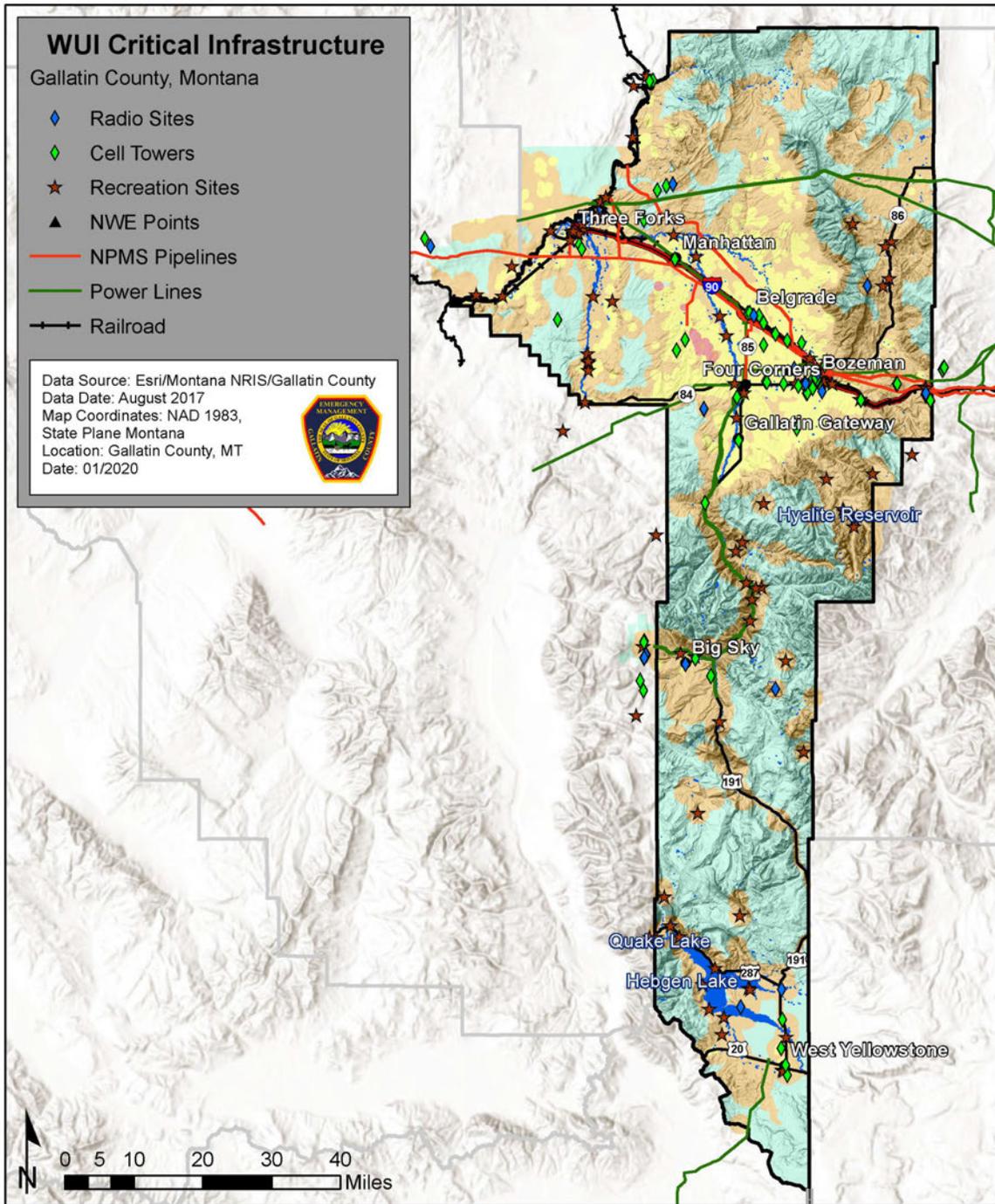


Figure 3-8. Critical Infrastructure Wildland-Urban Interface

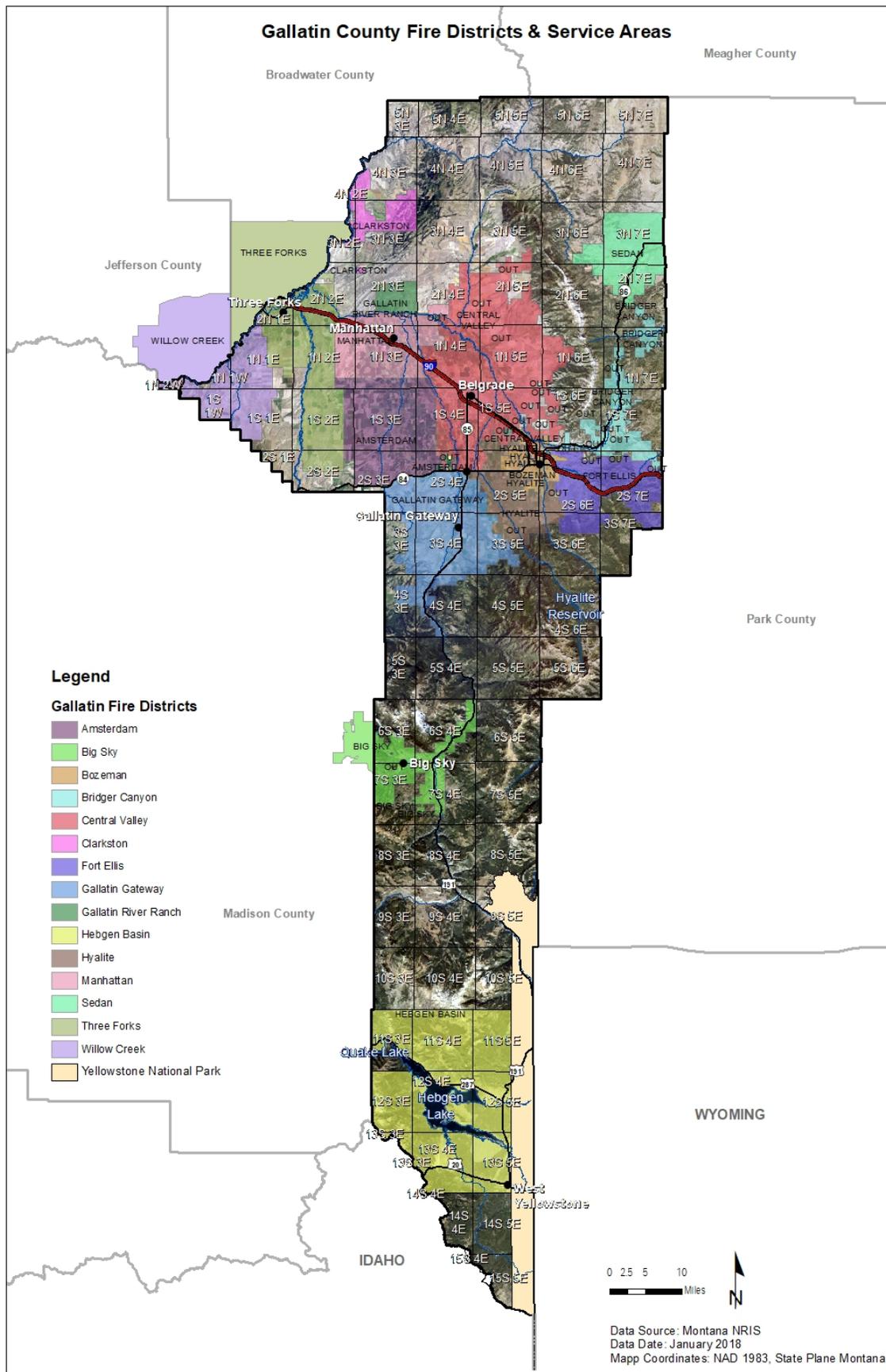


Figure 3-9. Gallatin County Fire Districts & Service Areas

Table 3-4 provides a breakdown of WUI area located within each fire district/service area jurisdiction, and Table 3-5 provides a listing of WUI area on federal and state-owned lands.

Table 3-4. Designated WUI Area by Fire District/Service Area and Gallatin County Rural Fire (County Fire)

Fire District or Service Area	WUI Area (Acres / % of total)	Description
Amsterdam	44,604 / 79%	primarily cropland, bench/draw terrain (Camp Ck. Hills, Madison Plateau)
Big Sky	32,751 / 88%	mid-elev. meadows, steep forested/mountain terrain, Gallatin R. canyon
Bozeman	12,169 / 95%	urban Gallatin Valley, Bridger/Bangtail foothills, Bozeman Ck./E. Gallatin R.
Bridger Canyon	25,855 / 99%	E. flank of Bridger range, Bridger canyon (broad valley), W. flank of Bangtails
Central Valley	116,559 / 99%	rural/urban Gallatin Valley, cropland, W. flank Bridger range, Dry Creek hills
Clarkston	15,333 / 100%	Missouri River valley, Horseshoe Hills
Fort Ellis	37,244 / 96%	southeast Gallatin Valley, Mt. Ellis, Bear Canyon, Bozeman Pass, Trail Creek
Gallatin Gateway	58,300 / 86%	Gallatin R./Canyon (Lava Lake to mouth), S. Cottonwood canyon, High Flat
Gallatin River Ranch	7,475 / 100%	Gallatin River, Horseshoe Hills
Hebgen Basin	64,572 / 51%	southern Madison range, Hebgen Lake, Quake Lake
Hyalite	29,366 / 100%	Middle Ck., mouths of Hyalite, Leverich & Sourdough canyons, Triple Tree bench
Manhattan	33,032 / 88%	primarily cropland, Gallatin/E. Gallatin Rivers, Camp Creek
Sedan	29,701 / 92%	northeast flank of Bridger range, north Bangtail Mountains
Three Forks	85,097 / 79%	cropland, Gallatin/Madison/Jefferson R., Madison R. valley/bluffs, Camp Ck. Hills
Willow Creek	50,847 / 67%	Jefferson River valley, Madison plateau
County Fire	141,033 / 53%	mainly northern extent of County (Clarkston, Horseshoe Hills, N. Dry Creek, Maudlow, N. Bridgers, Norris Rd., Madison R. valley, and isolated land parcels N & E of Bozeman)

Table 3-5. Designated WUI Area on Federal, State, and Municipal Property

Agency or Department	WUI Area (Acres)	Description
U.S. Forest Service, CGNF	255,124	Bridger and Bangtail ranges, Gallatin, Hyalite & Madison ranges
U.S. Bureau of Land Management	3,549	Dry Creek Hills, Horseshoe Hills, Madison Plateau, other
U.S. Fish and Wildlife Service	174	Bozeman Fish Technology center, other
National Park Service	13,227	Yellowstone National Park
FEDERAL LAND TOTAL	272,075	
State of Montana	149	various property within county
Montana State Trust Lands	32,041	distributed throughout county
Montana Fish, Wildlife & Parks	4,385	Region 3 headquarters, various fishing access sites
Montana University System	2,062	MSU-Bozeman, Post agronomy farm, Ft. Ellis research farm
Montana Dept. of Transportation	156	Nelson Rd. maintenance facility, various sand storage areas
MT-DNRC State Water Projects	73	Hyalite Reservoir
Gallatin County	1,144	various county infrastructure, road/bridge dept., Logan landfill
Municipal (incorporated cities/towns)	4,197	Belgrade, Bozeman, Manhattan, Three Forks, W. Yellowstone
STATE/MUNICIPAL TOTAL	44,207	

3.6.2 Wildland Urban Interface Risk in the West

According to a customized report prepared using the Economic Profile System (Headwaters Economics, 2019), Gallatin County ranks in the 73rd and 88th percentile, respectively, of existing WUI risk (amount of forested land where homes have already been built next to public lands), and future WUI risk (the area of undeveloped, forested private land bordering fire-prone public lands) throughout the West (413 western counties) in 2010. A higher percentile represents a greater relative risk, with the 100th percentile being the highest. Within the entire state of Montana, Gallatin County ranks in the 82nd percentile for existing risk, and 88th percentile for future potential risk, based on 2010 data. While home construction is not the only contributor to the rising cost of fighting fires, it is an important factor and one that is expected to rise with continued development, particularly in the absence of proper land use planning. A warming climate is likely to exacerbate these costs even further, continuing or even increasing the established risk rankings.

3.7 FIRE WEATHER

Fire weather is a combination of conditions that set the stage for the rapid spread of wildfires. The critical weather metrics that determine fire weather severity include temperature, relative humidity, winds, and atmospheric instability. Fire behavior specialists utilize specific indices that combine multiple weather parameters to predict the potential for fire ignition, spread rate, and heat release. The Energy Release Component (ERC) is a number related to the available energy (BTU) per unit area (square foot) within the flaming front at the head of a fire. Daily variations in ERC are due to changes in moisture content of the various fuels present, both live and dead. The ERC for fuel model G (short-needle, heavy dead) is often used in predictions of fire danger and large fire activity. The ERC-G has been shown to be strongly correlated with area burned in the western United States (Riley et al. 2013). Predictive Service Areas (PSAs) which integrate weather data from several Remote Automated Weather Stations (RAWS) are delineated to predict fuels and fire danger for given regions. The CGNF-Bozeman/Hebgen Lake Ranger Districts are within PSA-NR12, covering forested areas south of the Gallatin Valley to the southern extent of the county.

Figure 3-9 provides two graphs showing maximum, average and 83rd percentile ERC values over 11 years (2008 – 2018), and ERC traces for the 2008 and 2012 fire seasons. ERC values greater than 83% indicate potential for large fire growth. The average (blue line) plot shows a typical pattern of low ERC values in the spring, rising steadily through initial snow melt and green-up in April and May, then falling in late-May into June due to higher precipitation amounts that are common during that period. Dry, summer conditions begin to prevail in late-June and ERC values increase rapidly, typically exceeding the 83% threshold between mid-July and mid-September. Periodic fall moisture, coupled with steadily decreasing solar insolation, results in rapidly decreasing ERC values in late-September through early November, and diminished potential for wildfire. Notably, the maximum plot (black line), which represents the maximum ERC recorded for a particular date during the 11-year period, shows that ERC values can exceed 83% in early-May and remain above that threshold as late as November.

The years 2008 and 2012 are significant during the 11-year period, representing very different fire seasons. 2008 was a relatively mild fire season with less than two months where ERC values exceeded 83%. Conversely, 2012 saw nearly four months where ERC values exceeded 83%; the Millie Fire occurred in late-August of 2012 with ERC values at the 98%-level of the 11-year period (2008 – 2018).

Headwater Economics, A Profile of Development and the Wildland-Urban Interface (WUI). Generated for Gallatin County, MT using the Economic Profile System (EPS), April 2019.

EPS Data Sources:

Gude, P.H., Rasker, R. and van den Noort, J. 2008. Potential for Future Development on Fire-prone Lands. *Journal of Forestry* 106(4):198-205; U.S. Department of Commerce, 2011. TIGER/Line 2010 Census Blocks and 2010 Summary File 1, Washington, D.C.

Riley, K., et al., 2013, The relationship of large fire occurrence with drought and fire danger indices in the western USA, 1984-2008: the role of temporal scale.

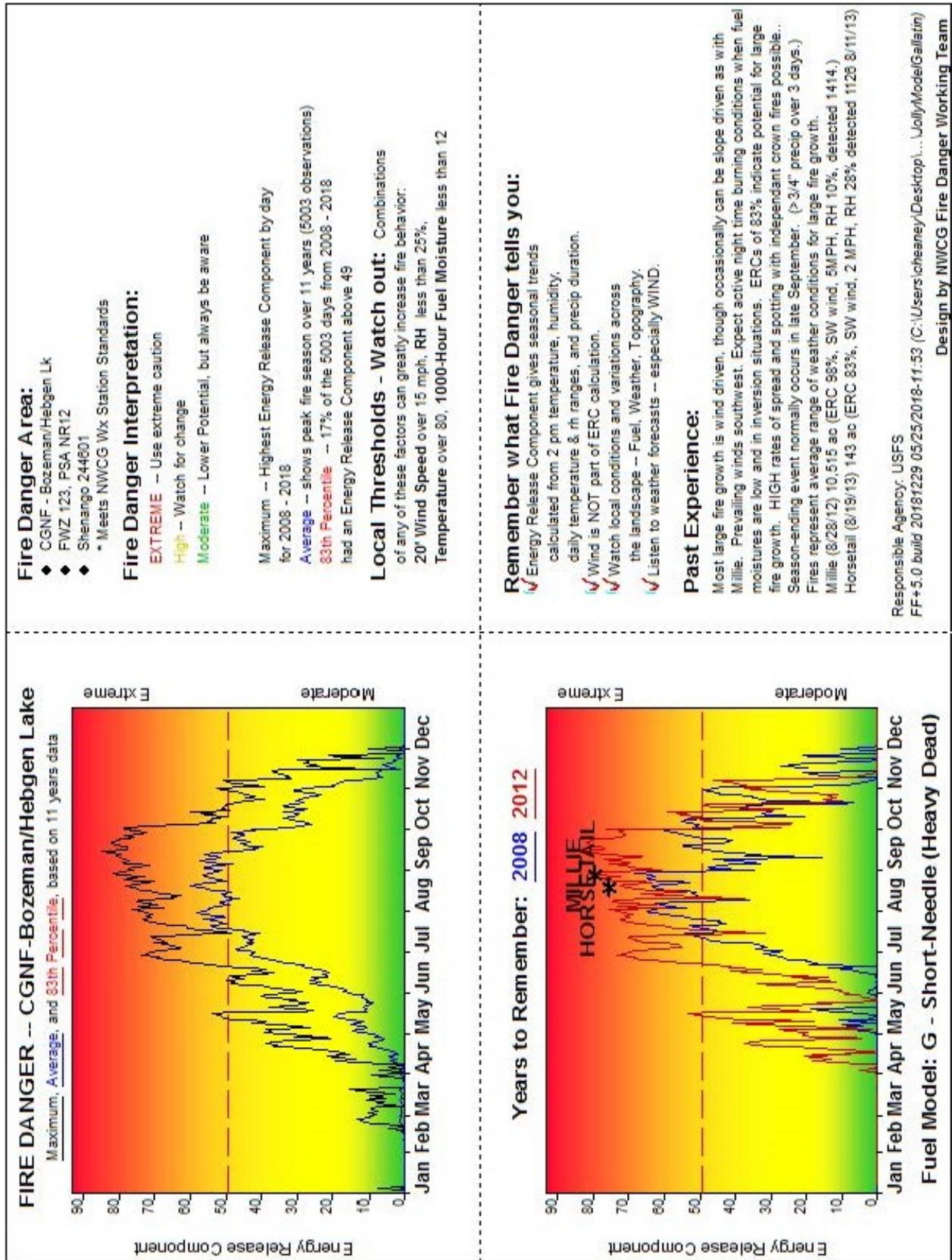


Figure 3-10. Graphs of Energy Release Component (ERC) for CGNF-Bozeman/Hebgen Lake Ranger Districts (2008 – 2018) [USFS, National Wildfire Coordinating Group-NWCG, Fire Danger Working Team]

3.8 WILDFIRE HISTORY

Gallatin County has a long history of wildfires from small to large. The extent of damages often depends on the proximity to the WUI, fire spread rates, and the effectiveness of suppression and mitigation measures. The history of wildfires can be difficult to compile because the various firefighting entities involved and a variety of recordkeeping measures over the years. The following list chronicles several of the critical / severe wildfire events that have occurred in the county over the last 30 years.

June – November 1988 - Greater Yellowstone Fires. Numerous fires throughout Yellowstone National Park raged through the entire summer and well into the fall of 1988. Some of these fires extended into portions of Gallatin County. The fires covered 2.3 million acres, employed an estimated 25,000 firefighters, and cost nearly \$120 million for fire suppression. One firefighter, and one pilot, were killed and structure losses were estimated at \$3 million, mostly within Yellowstone National Park.

August 2001 – Fridley Fire. Lightning ignited the Fridley Fire on August 19 near Fridley Creek in the Custer-Gallatin National Forest. The fire doubled in size on August 22 and displayed "extreme" behavior on August 23, when high winds caused it to double in size again. Montana Executive Order 20-01, issued on August 25, 2001, declared a state of emergency in Gallatin County and other locations across the state and mobilized state resources and the National Guard to fight the wildfires. On August 31, three members of a firefighting helicopter crew were killed on a maintenance flight when a bucket line tangled with a rotor, causing the helicopter to crash three miles south of Emigrant in Park County. The Fridley Fire was contained on September 13, 2001. In all, 26,373 acres burned from this fire and firefighting costs totaled over \$11 million with 1,261 personnel, 50 pieces of heavy equipment, and 14 helicopters used. Fortunately, no structures were lost. This was a significant fire for Gallatin County because the City of Bozeman watershed, which is the primary the drinking water supply for th city, was threatened.

September 2001 - Purdy Fire. Following the Fridley Fire by just a few weeks, the Purdy Fire ignited on September 26th in the upper Wilson Creek drainage southeast of Gallatin Gateway. By September 28, the fire had burned over 4,000 acres and caused the evacuation of over 50 homes.

September 2009 - Flaming Arrow Fire. Winds re-ignited the remnants of a controlled burn into a fast-moving grass fire in the Flaming Arrow subdivision just south of Bridger Bowl. The fire burned mostly on private land and threatened about 25 homes. The fire was 100 percent contained after burning approximately 250 acres over a four-day period.

June 2012 - Bear Trap Fire. A human-caused fire that was later determined to be arson, burned 15,500 acres in the Bear Trap Canyon area along the Madison River west of Bozeman. The estimated value of property lost in the fire, including one home, crops, pastures, fences, a vehicle, eight horses and electrical transmission lines totaled more than \$3.8 million. Approximately \$1.25 million was spent in suppression costs and involved over 200 firefighters.

August – September 2012 – Millie Fire. Burned 10,515 acres in the Storm Castle Creek drainage, approximately 20 miles southwest of Bozeman. The fire was not fully contained for nearly one month, and initially threatened to cross over into the Hyalite Creek drainage where it could potentially have affected a drinking water source for the City of Bozeman as well as other impacts to the heavily used Hyalite Reservoir recreation area. The fire caused closures of Hyalite Canyon, Leverich Canyon, and Sourdough Canyon (Bozeman Creek) for much of its duration.

October 2015 - Cottonwood Gulch Fire. This fire was accidentally started by a landowner's vehicle in the Cottonwood Gulch area north of Manhattan. The fire burned approximately 8,300 acres and one outbuilding before being fully contained.

August 2016 -Maple Fire. The Maple Fire was detected on the evening of August 8, 2016 by smoke jumper aircraft flying over Yellowstone. The cause was determined to be lightning. The southwest perimeter of the fire burned within 3.5 miles of West Yellowstone. Over 230 personnel were assigned to the fire at its peak. The fire burned over 45,000 acres of timber and short grass. While the Maple Fire threatened a small portion of Gallatin County, including West Yellowstone and areas immediate north along Highway 191, it did not burn any land within the county.

July – October 2018 – Bacon Rind Fire. The Bacon Rind Fire was detected on July 20th and continued to burn for over two months at varied intensity. The 5,232-acre fire was located approximately 20 miles south of Big Sky along the west side of Highway 191, within both Yellowstone National Park and CGNF-Lee Metcalf Wilderness, in an area that had not burned in the last 150 years. There are numerous meadows and forest breaks in the fire area, which, along with favorable weather and climatic conditions and lack of drought, reduced the potential of strong fire behavior and spread. The incident management approach allowed the fire to potentially clean out dead and downed trees and help restore a healthy ecosystem. Post-fire conditions will be conducive to new growth and create great habitat for wildlife, while reducing the potential for a future large fire.

September 2018 - Horseshoe Fire. This fire burned 1,223 acres in the Horseshoe Hills east of Clarkston. The fire began on Monday afternoon, Sept. 10th and was declared 100% contained on Saturday, Sept. 15th. Several structures were lost to this fire including three primary residences, two secondary residences, and several outbuildings [GCEM website, Horseshoe Fire Update, 9/14/18 – 9:30am].

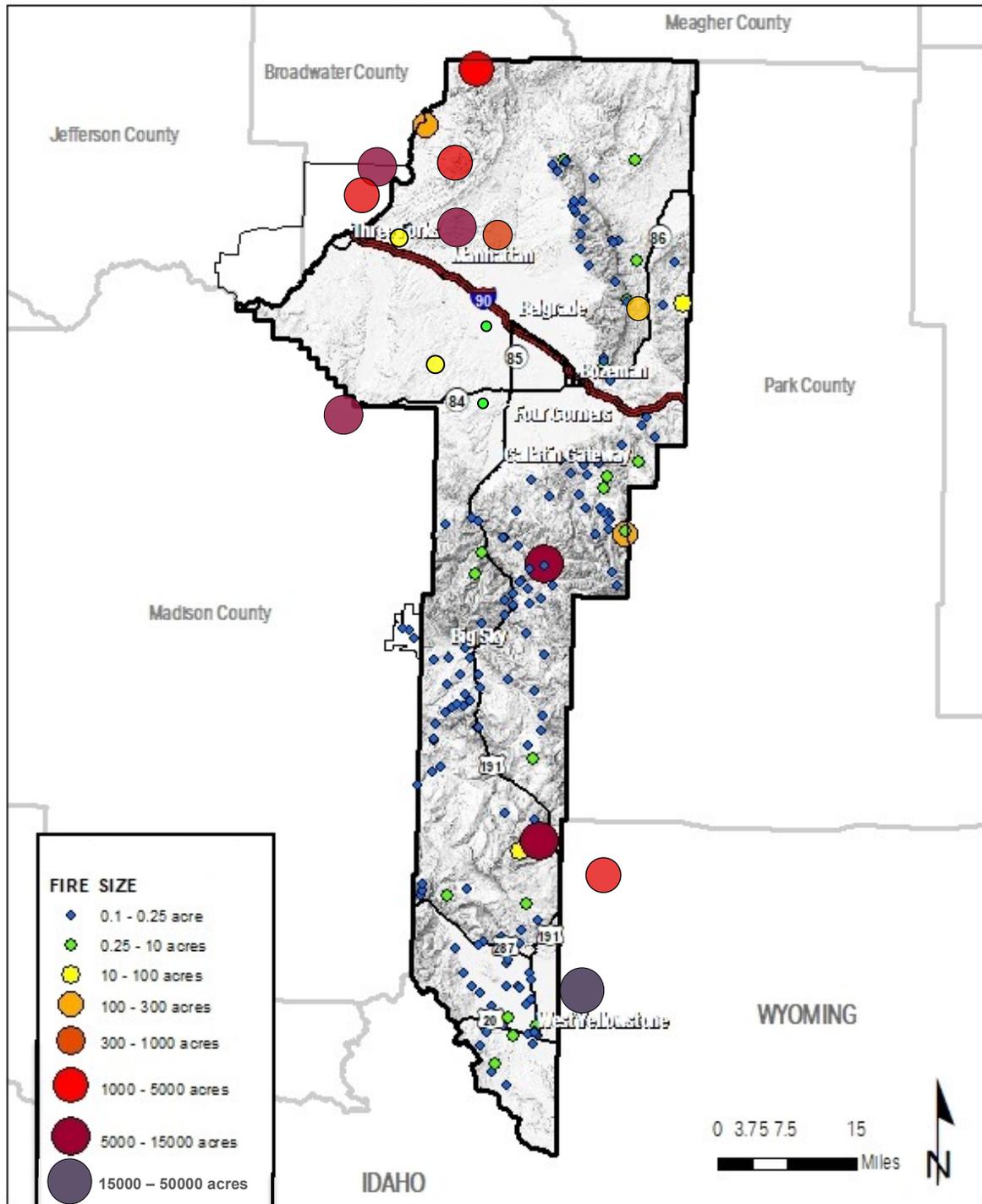
Within the last decade (2008-2018), the vast majority of wildfires in Gallatin County were less than 10 acres in size (**Class C** and smaller, NWCG). In fact, there were only five fires larger than 1,000 acres (**Class F**, NWCG) in the county during this period: Millie Fire (2012), Bean Canyon Fire (2012), Cottonwood Gulch Fire (2015), Bacon Rind Fire (2018), and Horseshoe Fire (2018). There were, however, five additional fires that exceeded 1,000 acres in size just outside the county boundary: Bear Trap 2 Fire (Madison County, 2012; the east boundary of this fire extended into Gallatin County), Copper City Fire (Broadwater County, 2013), Eustis Fire (Broadwater County, 2015), Fawn Fire (Yellowstone National Park, 2016), and Maple Fire (Yellowstone National Park, 2016).

Figure 3-10 provides a map of wildfire history in Gallatin County for the period 2008-2018. Some of these mapped events are not actually wildfires but rather local incidents that became extended fire events (e.g., Bear Trap Fire, 2012). Generally, across the CGNF land base, which includes Gallatin County, less than five percent of unplanned ignitions grow into larger fires (**Class F**: 1,000 acres or more, but less than 5,000 acres; and **Class G**: 5,000 acres or more), primarily due to extreme weather and wind conditions driving fire growth. Many occurrences of the smaller fire sizes (0.1 acre – 10 acres) shown on Figure 3-10 were not actual wildfires but rather unplanned ignitions that were reported by USFS and/or contained by initial attack resources, as documented by USFS-CGNF in the Wildland Fire Decision Support System (WFDSS).

The National Wildfire Coordinating Group (NWCG), Glossary of Terms, Accessed from website April, 2019:
<https://www.nwcg.gov/term/glossary/size-class-of-fire>

Fire History, 2008-2018

Gallatin County, Montana



Data Source: USDA Fire Program Analysis Fire Occurrence Database (2008-2015)
 FAMWEB Data Warehouse (2016-2018)
 Data Date: December 2018
 Map Coordinates: NAD 1983, State Plane Montana

Map Updated by:
 Troy Benn
 December 2018



Figure 3-11. Location and Fire Size Class of Wildfires in Gallatin County, 2008-2018

4 WILDFIRE RISK ASSESSMENT

4.1 OVERVIEW

Wildfire risk is a measure of both the probability and consequences of uncertain future wildfire events (Thompson et al., 2016). For any location within Gallatin County, wildfire risk depends on the likelihood of a fire occurring there, the expected intensity of the fire, and the vulnerability of resources or assets of value at that location. Fire scientists describe these three components of risk using a triangle where the sides are likelihood, intensity, and susceptibility. These three factors, and the resultant wildfire risk, vary across the county. This section of the CWPP describes tools currently used to assess wildfire risk in Gallatin County. The results of the risk assessment provide spatial context and inform where different wildfire management and mitigation strategies are most effective.



Components of the wildfire risk triangle (from Scott et al., 2013)

With an understanding of the components that contribute to wildfire risk and application of a coordinated and collaborative planning effort, Gallatin County and other stakeholders can take steps to influence each side of the risk triangle in different ways. For example, prevention measures that reduce human-caused fires can reduce the likelihood of fire occurrence, particularly in areas of human activity. Vegetation treatments focused on reducing fuel loads can reduce the intensity of fires that do occur, and efforts to reduce the flammability of building materials and increase defensible space around structures and communities can reduce susceptibility of homes and other structures to wildfire.

4.2 LANDSCAPE LEVEL RISK ASSESSMENT

The methodology used for wildfire risk analysis utilizes data that is representative of landscape-scale processes. Maps of fire *likelihood* and *intensity* can be used together to represent relative wildfire *hazard* for a given location. Computer simulation modeling of hypothetical wildfires provides a sound and scientifically defensible means of mapping wildfire likelihood and potential intensity. Fire models use weather data from long-term stations in the county, along with detailed spatial data depicting topography and aspects of vegetation that characterize wildland fuels to simulate fire spread across the landscape from semi-random ignition points. Simulations can be run for a plethora of statistically possible weather scenarios and thousands of iterations of a whole fire season using a model called **FSim** (Finney et al., 2011).

Thompson, M.P., T. Zimmerman, D. Mindar, and M. Taber. 2016. Risk Terminology Primer: Basic Principles and a Glossary for the Wildland Fire Management Community. Fort Collins, CO: USDA Forest Service Rocky Mountain Research Station. Gen. Tech. Rep. RMRS-GTR-349. <https://www.fs.usda.gov/treearch/pubs/50912>

Scott, J.H., M.P. Thompson, and D.E. Calkin. 2013. *A wildfire risk assessment framework for land and resource management*. Fort Collins, CO: USDA Forest Service Rocky Mountain Research Station. Gen. Tech. Rep. RMRS-GTR-315. <https://www.fs.fed.us/rmrs/publications/wildfire-risk-assessment-framework-land-and-resource-management>

Finney, Mark A.; McHugh, Charles W.; Grenfell, Isaac C.; Riley, Karin L.; Short, Karen C. 2011. *A simulation of probabilistic wildfire risk components for the continental United States*. *Stochastic Environmental Research and Risk Assessment*. 25: 973-1000. <https://www.fs.fed.us/rmrs/publications/simulation-probabilistic-wildfire-risk-components-continental-united-states>

The outputs from FSim include maps of the annual probability of fire occurrence and the most likely intensity at a very fine scale. This information can be used to support decisions related to wildfire suppression, fuel management planning, and resource allocation decisions. It is also critical for developing land and resource management plans.

4.2.1 Wildfire Simulation and Mapping

A regional, landscape-level risk analysis, completed by Pyrologix LLC (Gilbertson-Day, J., et al., 2017) using the Fsim model, was utilized to evaluate wildfire likelihood and intensity. Specific results of this modeling work for Gallatin County were made available for use in this CWPP by USFS Region 1 (Jessica Haas, personal comm.). The raw outputs from the model are raster, or pixel-based, datasets that divide the landscape into evenly sized square cells, each 180 meters (583 ft) on a side.

To summarize the raster FSim results and the corresponding fire hazard indices to a common mapping unit, fine-scale watershed polygons, referred to as catchments, were utilized from the US Environmental Protection Agency (USEPA) and US Geological Survey (USGS) National Hydrography Dataset Plus, version 2 (<https://www.epa.gov/waterdata/nhdplus-national-hydrography-dataset-plus>). Displaying the results by summary polygons improves data understanding and allows for broad-scale patterns to emerge that may otherwise be missed in raw pixel datasets. There are 4,864 catchments that intersect the Gallatin County boundary plus the extra-county areas included to capture the Big Sky, Three Forks and Willow Creek fire jurisdictions. The resulting catchment and partial catchment summary unit polygons range in size from 0.0009 to 96.39 km², and average 1.67 km².

4.2.1.1 Fire Likelihood

Fire likelihood, or burn probability (BP), is the Fsim-modeled annual likelihood that a wildfire will burn a given point or location. It is calculated as the number of times a given pixel burns during a simulation divided by the total number of iterations and represents a true annual burn probability that considers all possible weather scenarios. This methodology provides a long-term perspective on the relative likelihood of fire for any location in the county in any given year.

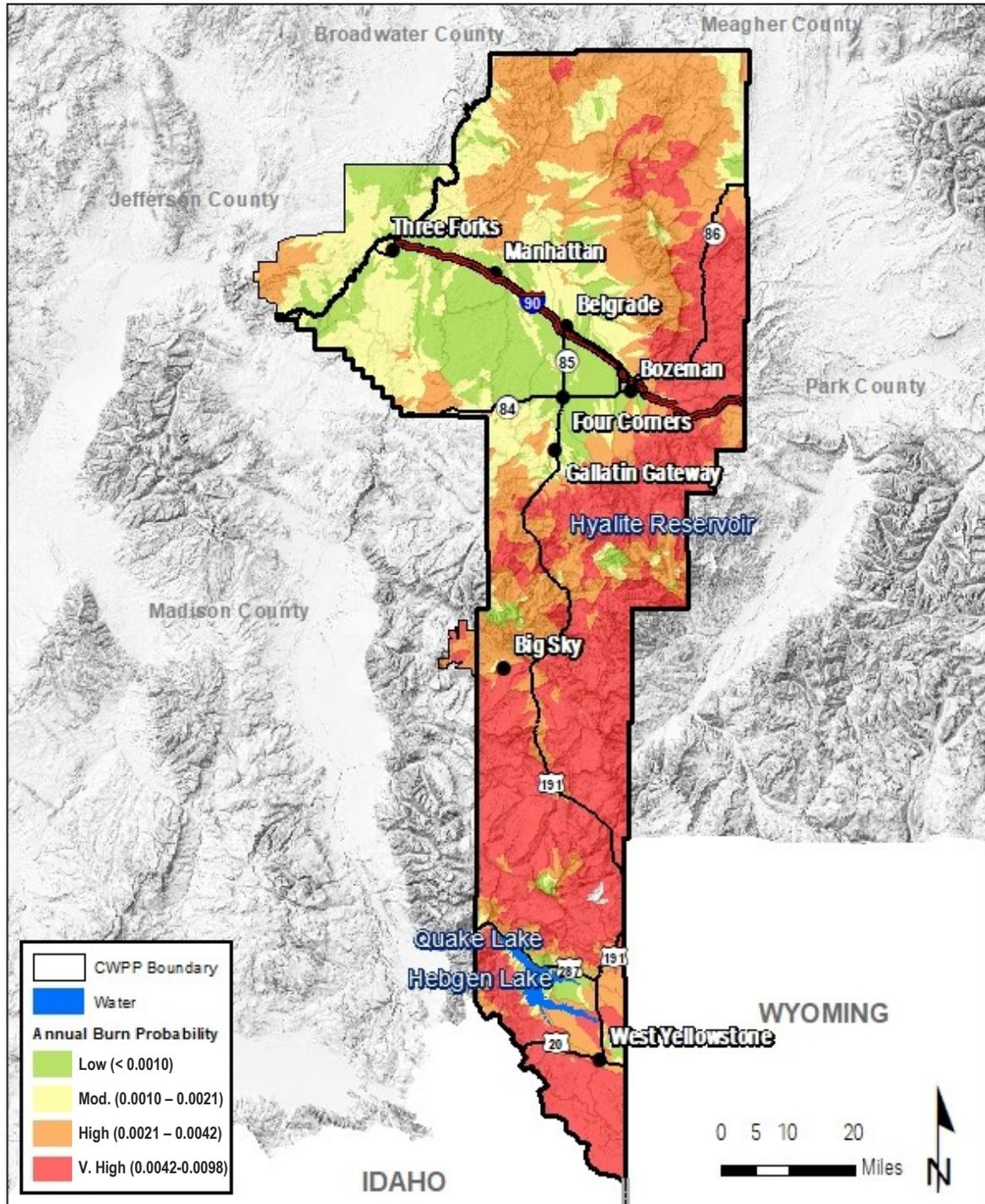
To produce a map of relative wildfire likelihood for Gallatin County, the average BP for each catchment was calculated, and those averages were classified into four classes of low, moderate, high and very high (**Figure 4-1**). The classes are relative to the distribution of catchment averages only within Gallatin County and are based on quartiles. Therefore, the high and very high classes represent all catchments with an average BP value above the county median. The average BP for catchments ranges from 0 to 0.0098, with a mean of 0.0021. Thus, a given catchment has about a 1 in 476 chance of burning in any given year.

In general, wildfire likelihood is highest on forested, middle- to upper-elevation sites including: 1) the east flank of the Bridger Mountains across Bridger Canyon to the east and into the Bangtail Mountains; 2) the Gallatin Front along the south end of the Gallatin Valley; and 3) the southern portion of the county, including the Gallatin and Madison ranges and areas around Big Sky, extending south to Hebgen Basin and the area southwest of West Yellowstone. Areas with low burn probability include: 1) irrigated agricultural lands within the Gallatin Valley, predominantly south of I-90; 2) small areas above treeline in the Hyalite Mountains and Spanish Peaks; and 3) part of Hebgen Basin, particularly the northeast side of Hebgen Lake.

Gilbertson-Day, J., Scott, J.H., Vogler, K.C., and Brough, A. 2017. *Northern Region Wildfire Risk Assessment: methods and results*. Internal report to USFS Region 1; unpublished.

Relative Wildfire Likelihood

Gallatin County, Montana



Data Source: FSIM data, Custer Gallatin National Forest, Rocky Mountain Research Station, Fire Modeling Institute, USDA Forest Service, Montana NRIS
 Data Date: June 2018
 Map Coordinates: NAD 1983, State Plane Montana

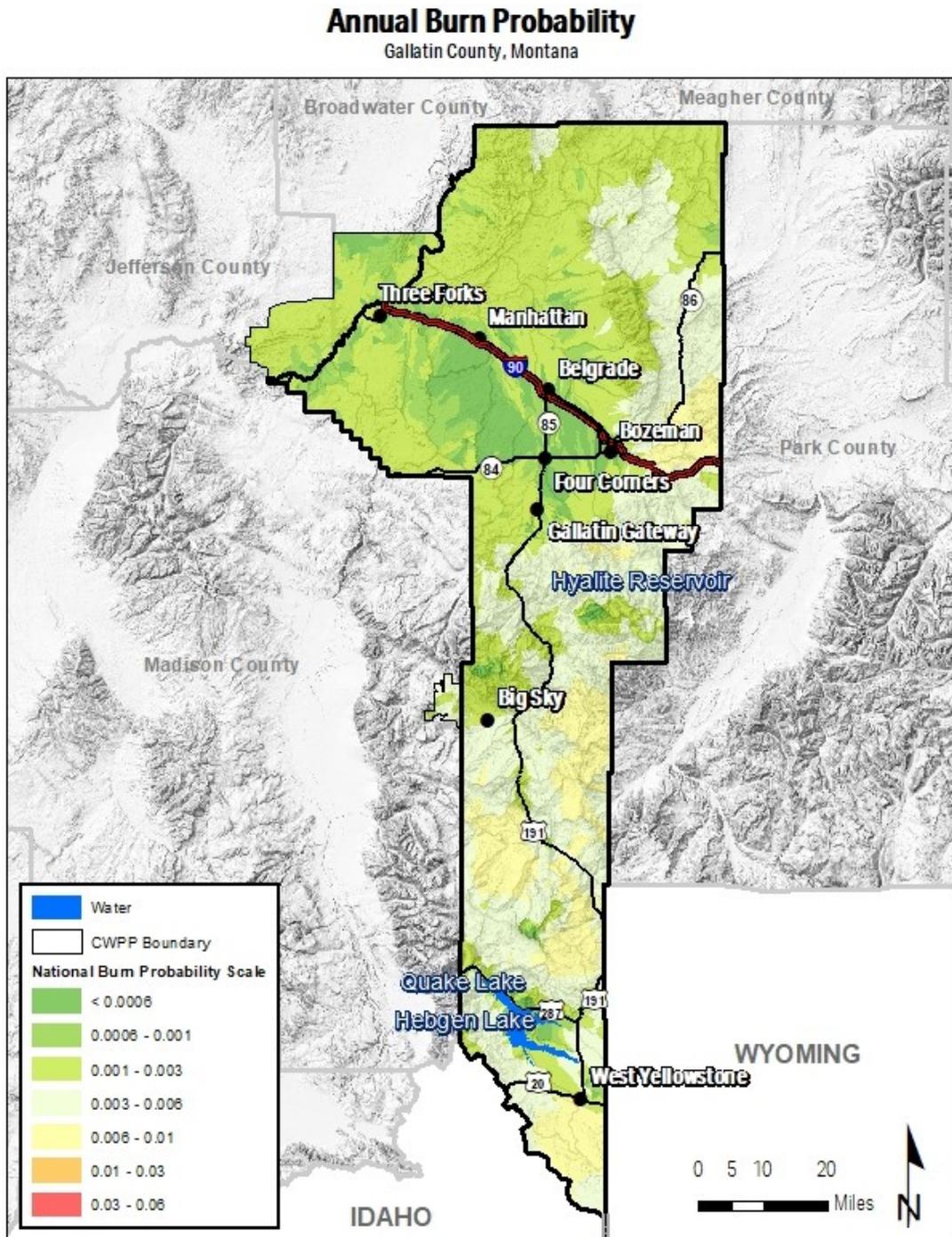


Map Updated by:
 Libby Ellwood
 June 2018
 Benn, 2/2019



Figure 4-1. Relative Wildfire Likelihood for Gallatin County

It is important to restate that the four wildfire likelihood classes represent a relative distribution within the county. When mapped on a standard national scale for burn probability (Figure 4-2), it is apparent that the entire county has a low to moderate burn probability (mean BP values < 0.01 for all catchments).



Data Source: FSIM data, Custer Gallatin National Forest, Rocky Mountain Research Station, Fire Modeling Institute, USDA Forest Service, Montana NRIS
 Data Date: June 2018
 Map Coordinates: NAD 1983, State Plane Montana



Map Updated by:
 Libby Ellwood
 June 2018
 Benn, 2/2019



Figure 4-2. Annual Burn Probability – National Scale for Gallatin County

4.2.1.2 Fire Intensity

The FSim model can be used to distribute burn probability into wildfire intensity levels and generate probability estimates of a specific flame length class when fire burns a given pixel. Conditional Flame Length (CFL) represents the average fire intensity for each pixel from many simulated fires. An averaged CFL value is calculated for each catchment from individual, pixel-level CFL values. The map of relative wildfire intensity for the county was created by grouping the averaged catchment CFLs into four classes (**Figure 4-3**). In this case, the classes are based on standard flame length categories of 0 to 2 feet, 2 to 4 feet, 4 to 6 feet, and 6 feet and greater. The average flame lengths for catchments range from 0 to 41 feet, with a mean of 3.87 feet.

Areas with the highest potential fire intensity in the county are primarily mid-elevation watersheds with higher fuel loads. Within Gallatin County these areas include: the Clarkston/Horseshoe Hills; much of the Bridger Mountain range, Bridger Canyon, and the Bangtail Mountains; Bear, Hyalite and Sourdough Canyons south of Bozeman; Trail Creek Rd. area; and portions of the Madison and Gallatin ranges south of Big Sky. Conversely, high elevation areas generally have lower fire intensity due to lesser fuel loads (e.g., areas at or above treeline), and maintenance of higher soil and vegetation moisture levels into the summer season. Most of the Gallatin Valley also exhibits lower fire intensity due to limited fuel loads (brush, grasses) and the presence of large areas of irrigated crops.

4.2.1.3 Relative Wildfire Hazard

The likelihood and intensity sides of the wildfire risk triangle can be integrated to represent wildfire hazard. Thus, relative wildfire hazard is calculated by multiplying burn probability by the conditional flame length. Hazard values were determined at the pixel scale and then summarized by determining an average hazard value for each catchment. Following a similar approach as fire likelihood, the average hazard values for catchments were grouped into four classes based on quartiles of the hazard distribution across the county. The actual numeric values of hazard are less directly interpretable than BP or CFL, however they do provide a relative measure of fire hazard at a landscape scale. **Figure 4-4** provides a map of relative wildfire hazard for Gallatin County.

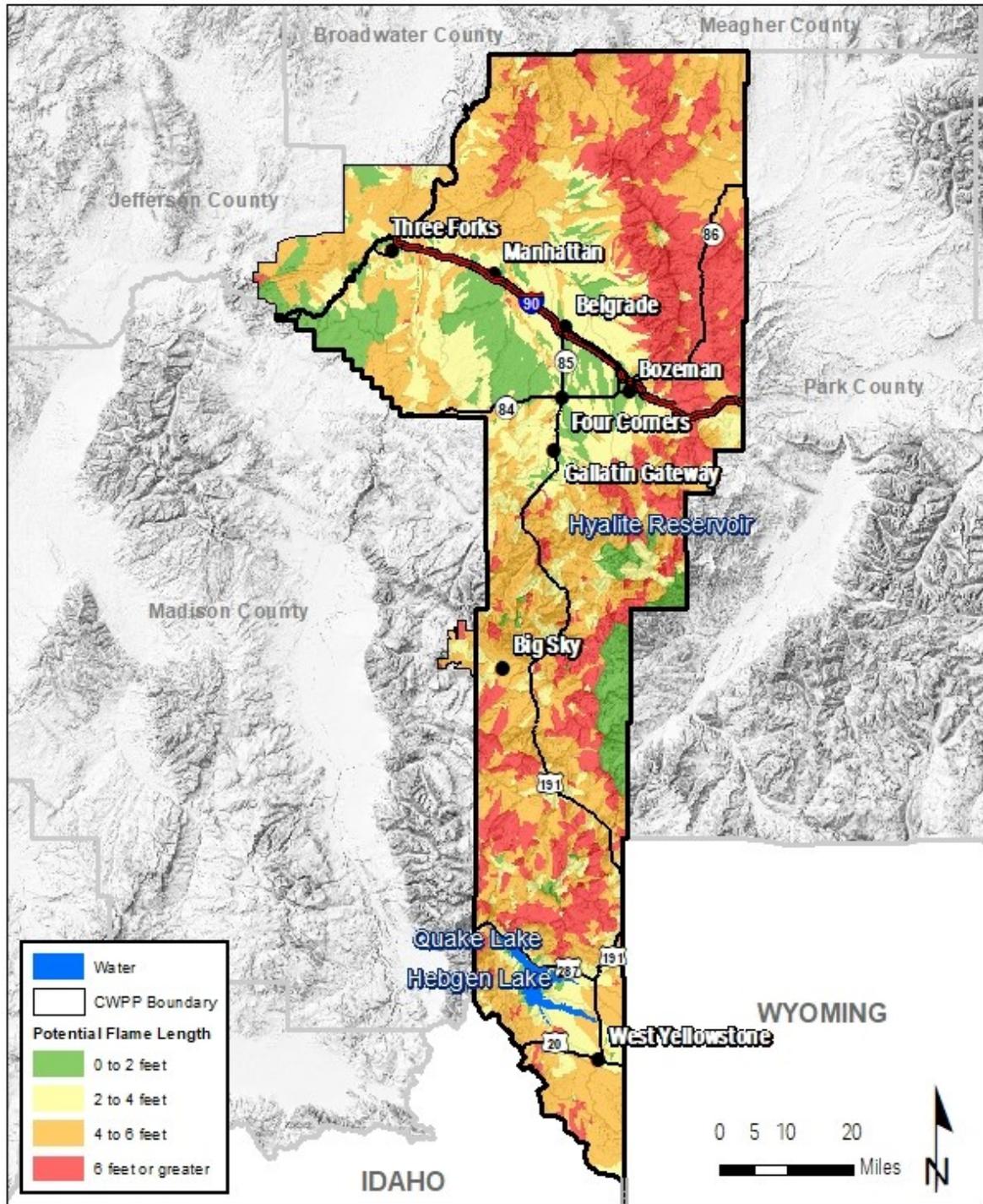
When comparing all three wildfire risk mapping products, the influence of both fire likelihood and fire intensity are evident in the relative wildfire hazard map. Similar to the likelihood mapping, the greatest wildfire hazard is found in the mid- to upper-elevation, forested areas of the county including: Horseshoe Hills; nearly the entire Bridger Mountain range, Bridger Canyon, and Bangtail Mountains; the Gallatin Front and Trail Ck. area south/southeast of Bozeman; and most of the county from the Big Sky area south, with the exception of some areas immediately surrounding Hebgen Lake.

4.2.2 Susceptibility and Risk

Information about susceptibility (or vulnerability) of specific assets is more difficult to map. The Fsim analysis completed by Pyrologix does not provide enough information to adequately represent the susceptibility of communities to wildfire. This analysis did develop abstract estimates of susceptibility (known as response functions) for a variety of natural resources and built assets, but the focus of that assessment was on setting land management and wildfire management priorities on national forest lands.

Potential Flame Length

Gallatin County, Montana



Data Source: FSIM data, Custer Gallatin National Forest, Rocky Mountain Research Station, Fire Modeling Institute, USDA Forest Service, Montana NRIS
 Data Date: June 2018
 Map Coordinates: NAD 1983, State Plane Montana



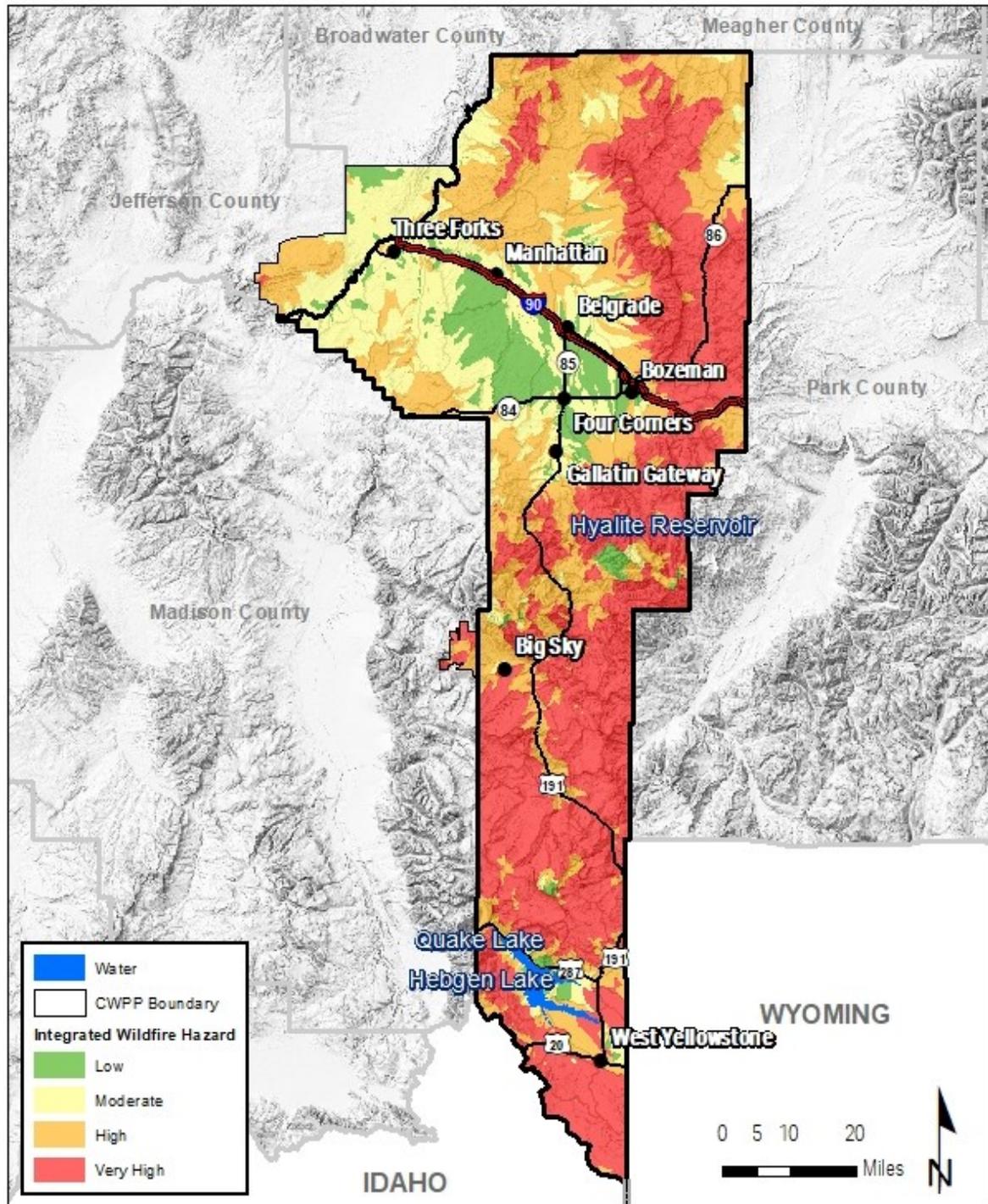
Map Updated by:
 Libby Ellwood
 June 2018
 Benn, 2/2019



Figure 4-3. Burn Intensity based on Potential Flame Length for Gallatin County.

Relative Wildfire Hazard

Gallatin County, Montana



Data Source: FSIM data, Custer Gallatin National Forest, Rocky Mountain Research Station, Fire Modeling Institute, USDA Forest Service, Montana NRIS
 Data Date: June 2018
 Map Coordinates: NAD 1983, State Plane Montana



Map Updated by:
 Libby Ellwood
 June 2018
 Benn, 2/2019



Figure 4-4. Relative Wildfire Hazard for Gallatin County.

The response functions developed in that analysis estimated negative impacts to communities at all levels of fire intensity, but these impacts are vaguely defined and not specific for different types of structures. While this information provides some insights into wildfire risk, it does not facilitate a thorough mapping of risk across the county.

In future efforts, susceptibility could be evaluated at multiple scales to facilitate calculation of wildfire risk metrics in and around developed areas in the county. At a community or neighborhood scale, factors similar to those used in the Pyrologix assessment could be used to develop community-level susceptibility ratings. The rating areas could be watersheds, like the catchments used to determine and map fire hazard indices; however, the areas could be more meaningful if they represent community or neighborhood boundaries used for planning and fire response purposes. Within each rating area, factors such as ingress/egress, distance to nearest fire station (or average response time), local water supply (e.g., streams, lakes, storage tanks/hydrants), and structure density could inform integrated ratings of community susceptibility to wildfire of different intensities.

At the parcel level, assessments of individual structures that evaluate factors such as building materials, defensible space, and fuel loads on the property can inform susceptibility at a much finer scale. As with broader scale assessments, susceptibility ratings at the parcel scale should consider wildfire of different intensity levels. The Montana Department of Natural Resources and Conservation (DNRC) has developed a program using software developed for the state of Montana by the Intterra Group (Situation Analyst) which may be useful to fire districts in supporting this task.

Combined with susceptibility information at either of the scales described above, the likelihood and intensity data can be used to calculate relative wildfire risk to entire communities or individual parcels. With spatial data for all three sides of the wildfire risk triangle, a metric called Net Value Change can be calculated that accounts for the risk posed by wildfire at different intensities for any location on the landscape. At the community or landscape scale, the Net Value Change metric, and the component information used to calculate it, can support the prioritization and planning of specific community-level mitigation through vegetation management and local land use planning and policy. At the parcel scale, the same information can support landowners in making the right decisions to make their property fire safe.

4.2.3 Improve Risk Assessment Information

The importance of high quality, current risk assessment information is critical to the success of this planning effort. Data used in the risk assessment must have adequate quality and resolution to facilitate accurate modeling of the risks. Assessment of wildfire risk also requires detailed, accurate information on development patterns in the WUI, changes in fire suppression resources and methods, and the effects of recent fires. The following steps should be taken to improve the risk assessment analysis and information:

1. Resulting landscape changes from the 2018 wildfire season should be incorporated into an updated wildfire risk assessment. This would require extensive field work and data analysis.
2. Compile parcel-level assessment data to inform and complete risk assessment, increase first responder information, and encourage public engagement. Parcel-level assessment data would not only provide the susceptibility information required for a complete risk assessment, but also provide valuable information for fire districts and residents to guide private property mitigation efforts.

<http://dnrc.mt.gov/divisions/forestry/fire-and-aviation/fire-prevention-and-preparedness/home-fire-risk>

4.2.4 Risk Assessment Summary

The 2017 wildfire season was one of the worst fire seasons in Montana history, with the highest number of acres burned in over a century. In 2017, a total of 1,366,498 acres burned in Montana (NIFC, 2018, www.nifc.gov). Gallatin County was fortunate in 2017 and did not experience a major wildfire that season. Nonetheless, fuels mapping should be updated to facilitate analysis of current wildfire risk based on the most recent information.

5 A COHESIVE STRATEGY APPROACH IN GALLATIN COUNTY

5.1 OVERVIEW

The National Cohesive Wildland Fire Management Strategy “Cohesive Strategy” (USDA, USDO, 2014) is a strategic push to work collaboratively among all stakeholders and across all landscapes, using best science, to make meaningful progress towards the three goals:

- / Resilient Landscapes
- / Fire-Adapted Communities
- / Safe and Effective Wildfire Response

The Cohesive Strategy’s **Vision** for the next century is:
To safely and effectively extinguish fire when needed; use fire where allowable; manage our natural resources; and as a nation, to live with wildland fire.

The planning process for this CWPP includes integration with the National Fire Plan, HFRA, Disaster Mitigation Act, and Cohesive Strategy, all of which promote local collaborative processes. Goals for restoring resilient landscapes, improving wildland fire response, and creating fire-adapted communities must work within the bounds of local budgets, personnel, and equipment. The efforts and success of the Gallatin County CWPP hinge on the funding and expertise of the local fire management districts and agencies as well as the cooperative efforts of landowners to empower local communities and citizens to pursue and implement projects that protect people, property, and infrastructure from wildland fire without diminishing the private property rights of land/asset owners within Gallatin County.

The guiding principle for this strategy is: to engage Gallatin County residents, communities, businesses, non-profits, and local, state, and federal governments to empower each other to prepare for wildfire through:

- / Community engagement and develop awareness of community roles in preparing for wildfire;
- / Effective administration of wildfire hazard mitigation grant programs that leverage additional resources for implementation;
- / Hazard risk assessments; and,
- / Strategic, efficient, and effective fuels treatments.

5.1.1 Objectives

The following objectives are presented to define the Cohesive Strategy in Gallatin County and provide a roadmap for implementation.

1. Engage citizens in the challenges of wildfire preparedness in Gallatin County using the tools and guiding principles set forth by the Fire Adapted Communities Learning Network (FACLN).
2. Seek out, encourage, and empower local community leaders in the wildfire preparedness roles of business, fire response, homeowners, land managers, and local government at multiple scales across Gallatin County.

3. Determine areas at risk to wildfire and establish/prioritize mitigation projects that utilize both conventional and alternative treatment methods to protect people, homes, infrastructure, state and federal listed species, and natural resources throughout Gallatin County.
4. Improve the ability of fire departments/districts/service areas to provide emergency fire response for the residents of Gallatin County through improved resources, training, and equipment.
5. Through strategic planning, develop and implement policies or protection measures that discourage further unmitigated development in high fire risk areas.
6. Implement vegetation management and other types of projects that promote the natural fire regime appropriate to the location for the benefit of the ecosystem and to lessen the risk of uncharacteristic wildland fire occurrences.
7. Promote recognition and utilization of the Gallatin County CWPP, empower local leadership and help leverage resources and opportunities to achieve shared goals without reducing the autonomy of individual communities and residents.
8. Provide direction through specific wildland fire prevention or protection action items to all members of the community to encourage individual responsibility including residents and homeowners, fire and emergency responders, forest and land managers, civic and community leaders, and designers and developers.

Each of the following sections provides an overview of the topic, local information, and strategies and resources to address the goal. Specific actions are provided in the Action Table (Section 6.3).

5.2 RESTORING AND MAINTAINING RESILIENT LANDSCAPES IN GALLATIN COUNTY

Through fire suppression and human development, coupled with a changing climate, the interaction of terrestrial ecosystems and wildland fire has been significantly altered over time. Restoring landscapes to a resilient state and promoting fire's natural role in ecosystems where appropriate must be an integral part of increasing the county's resilience to wildfire and becoming fire-adapted. An ecosystem-based approach to fire management that incorporates prescribed fire, mechanical thinning, and other vegetation management practices in overall land management planning objectives is important to both achieve desired fire effects and mitigate undesirable fire effects on the ecosystem and the built environment. Post-wildfire recovery is an important component in resiliency to ensure that any negative fire effects that impact the ecosystem and community can be minimized. With a diverse land ownership across the county, restorative land management will require a collaborative effort among multiple stakeholders.

5.2.1 Ecology/Ecosystem-Based Fire Management

Restoration and maintenance strategies should align with the Cohesive Strategy, as outlined below, and integrate the following goals:

- / Where allowed and feasible, manage wildfire for resource objectives and ecological purposes to restore and maintain fire-adapted ecosystems and achieve fire-resilient landscapes, including the importance of the high-intensity fire regime component.
- / Restore forest processes that are currently under-represented in the landscape, compared to historical conditions, including low- and mixed-severity fire regimes.

- / Maintain and promote the growth of specific large tree species, which are also under-represented, across the landscape.
- / Control and eradicate invasive and noxious weeds.

5.2.2 Fuel Treatments for Landscapes (Public and Private)

Healthy, thriving ecosystems are less vulnerable to extreme wildfires that can devastate watersheds, destroy wildlife habitat, and risk lives. Healthy ecosystems can adapt to climate change, invasive species, and insect infestations. In many areas, aggressive fire suppression has limited the extent wildland fires leaving forests and grasslands crowded with flammable vegetation. Climate change has made fire seasons longer and droughts and insect infestations worse. Entire landscapes are now vulnerable to devastating, extreme wildfires. Thinning, prescribed fires, and managing naturally caused wildfires to achieve natural resource management objectives can help prevent extreme wildfires with minimal impacts to air quality while smoke from extreme wildfires may pose significant risks to public health and safety.

The USFS is working with partners to restore healthy, resilient, fire-adapted ecosystems. Restoring ecosystems includes thinning crowded forests and using prescribed fire to prevent the buildup of flammable vegetation that feeds extreme wildfires. Assessments of more than 1,400 fuel treatments since 2006 have shown that they are effective in reducing both the cost and damage from wildfires. In certain locations, when and where conditions are right, naturally caused wildfires can be managed to perform their natural role in controlling fuel buildup, rejuvenating vegetation, and restoring ecosystems that benefit from fire. **Table 5-1** provides a list of proposed and recently completed USFS fuels reduction projects in Gallatin County. The USFS will continue to work with partners to identify additional areas for fuels treatment that meet the goals of this CWPP.

Table 5-1. Proposed and Recently Completed USFS Fuels Reduction Projects (USFS, Custer-Gallatin N.F. ¹)

Project Name	Proposed Areas (Acres)	Legal Location	Burn (Y/N)	Implementation Date
Gallatin Canyon East				2022
South Plateau				2021
North Bridgers Forest Health Project	2,560	T1N, R6E & R7E; T1S, R6E & R7E	Y	July 2019
Bozeman Municipal Watershed Project	4,700	T3S, R5E & R6E	Y	late-2019 (tentative), continue 5 – 12 yrs.
North Hebgen Multiple Resource Project	5,900	T11S, R4E & R5E; T12S, R4E & R5E; T13S, R5E	N	begin 2019, continue for 8 – 12 years
Lonesome Wood Vegetation Mgmt. 2 Project	2,575	T11S, R3E; T12S, R3E; T12S, R4E; T13S, R4E	Y (potential on 325 ac.)	began 2017, to continue for 6 - 8 years
Rendezvous Ski Trails Forest Thinning Project	250	T13S, R5E; T14S, R5E	N	2015 (fall) – 2018 (fall)
South Bridger Interface Project	250	T1N, R7E; T1S, R7E	N	2015 (completed)
Hebgen Basin Fuels Reduction Project	1,610	T12S, R5E; T13S, R5E	Y	2011 (completed)

¹ Accessed from [Custer-Gallatin National Forest Project Archive](https://www.fs.usda.gov/wps/portal/fsinternet/cs/projects/custergallatin/landmanagement/projects?archive=1&sortBy=1) list on Jan. 8, 2019. URL: <https://www.fs.usda.gov/wps/portal/fsinternet/cs/projects/custergallatin/landmanagement/projects?archive=1&sortBy=1>

Lands owned and managed by state (DNRC) and municipal (City of Bozeman) entities have also been proposed for forest health and fuels reduction projects. **Table 5-2** provides a list of proposed and recently completed projects on state and municipal land.

Table 5-2. Proposed and Recently Completed Fuels Reduction Projects on State and Municipal Land

Project Name	Proposed Areas (Acres)	Legal Location	Burn (Y/N)	Implementation Date
Limestone West Timber Sale Project (DNRC-Bozeman Unit)	448 (proposed in Final EIS, modified Alternative A)	T2S, R6E; T3S, R6E	N	<i>Conservation license and 25-year logging deferral issued by DNRC in April 2019, effectively cancelling the project</i>
Bear Canyon Timber Sale Project (DNRC-Bozeman Unit)	674	T2S, R6E; T3S, R6E	N	2011
Sourdough Creek Municipal Watershed Fuels Management Project (City of Bozeman)	400	T3S, R6E	N	2019

The 2006 Gallatin County CWPP recommended that fuels mitigation work be conducted on private property, and suggested the county identify landowners that are willing to create defensible space or a general wildfire mitigation area as a demonstration project. It was further suggested that efforts be coordinated with the CGNF and the DNRC. No specific areas or projects were identified on privately-owner lands; however, moving forward the following general fuel treatment guidance is recommended:

- / Design and prioritize fuel treatments (prescribed fire and mechanical treatments) to reduce fire intensity, structure ignition, and negative wildfire impacts to identified assets.
- / Where feasible, implement strategically placed fuel treatments to interrupt fire spread across landscapes.
- / Use and expand fuel treatments involving mechanical, biological, or chemical methods where economically feasible and sustainable, and where they align with landowner objectives.
- / Reduce the risk of wildfire by removing fuels, especially small-diameter trees, while maintaining forest structure to protect ecosystem components.

5.2.3 Prescribed Fire

Prescribed fire is a planned fire used to meet management objectives. Following many years of fire exclusion, an ecosystem that needs periodic fire becomes unhealthy. Trees are stressed by overcrowding; fire-dependent species disappear; and flammable fuels build up and become hazardous. The right fire at the right place at the right time:

- / Reduces hazardous fuels, protecting human communities from extreme fires;
- / Minimizes the spread of pest insects and disease;
- / Removes unwanted species that threaten species native to an ecosystem;
- / Provides forage for game;
- / Improves habitat for threatened and endangered species;
- / Recycles nutrients back to the soil; and
- / Promotes the growth of trees, wildflowers, and other plants.

The USFS manages prescribed fires and even some wildfires to benefit natural resources and reduce the risk of unwanted wildfires in the future. The agency also uses hand tools and machines to thin overgrown sites in preparation for the eventual return of fire.

5.2.4 Post-Fire Effects and Recovery

Several post-fire outcomes can result from either wildfire or prescribed burn events. Prescribed fire planning goals and objectives are typically defined by desired ecosystem or hazard reduction results. These goals and objectives should be clearly stated in the prescribed fire plan and a monitoring program should be in place to measure the post-fire conditions.

Wildfire events can result in significant post-fire impacts – both positive and negative. Risk assessments can provide guidance in anticipating post-wildfire impacts, mitigating these impacts before a fire occurs and reducing recovery efforts. The development of a post-wildfire recovery plan, based on the anticipated impacts, can help the communities affected become more resilient to wildfire.

5.3 PROMOTING A FIRE-ADAPTED GALLATIN COUNTY

Promoting fire-adapted communities focuses on preventing, preparing for, and protecting lives and properties during wildfire events and ensuring a full recovery. The National Wildfire Coordinating Group defines a fire-adapted community as “A human community consisting of informed and prepared citizens collaboratively planning and taking action to safely coexist with wildland fire.” More fully, a fire-adapted community is a knowledgeable, engaged community where actions of residents and agencies in relation to infrastructure, buildings, landscaping and the surrounding ecosystem lessen the need for extensive protection actions and enable the community to safely accept fire as part of the surrounding landscape.



There are many paths to becoming fire-adapted, such as through education, mitigation, policies, and regulations. Fire-adapted communities may implement established national programs, such as [Firewise USA™](#) and [Ready, Set, Go!](#), develop a CWPP, enhance local capacity, conduct fuel reduction and forest management activities, and use codes and ordinances to regulate development in fire-prone areas. In Gallatin County, the Montana State University (MSU) Extension office administers several projects that are targeted at creating fire-adapted communities and provides information, materials and short-courses designed to reduce wildfire risk and promote forest stewardship. [Wildfire Preparedness Kits](#) are available to provide individuals and agricultural producers with several resources regarding preparing for, responding to, and recovering from wildfire. Through education, fire-adapted communities realize that living with wildfire is an ongoing process, not an event, and continually work in their areas to manage vegetation, improve response for first responders, and be ready to evacuate at any time.

The more actions a community takes, the more fire-adapted it becomes. However, because communities have limited resources, strategic identification of actions is necessary to best leverage fire adaptation at the local level. Promoting a fire-adapted Gallatin County also requires alignment with activities for restoring resilient landscapes and improving wildfire response.

5.3.1 Community Values

Gallatin County has many community values that could be vulnerable to wildfire. These values at risk, which should be considered when devising plans for fire-adapted communities, include:

- / Homes, businesses, and commercial areas;
- / Communication and power generation facilities and power transmission lines;
- / Transportation corridors and airports;
- / Community water supply areas (watersheds), creeks, rivers, and lakes;
- / Forested areas and open space;
- / Aquatic and terrestrial wildlife;
- / Air quality, public health and life safety;
- / Local, state, and federal recreational lands;
- / Historic sites and cultural areas; and,
- / Critical infrastructure and facilities (i.e., hospitals, schools, etc.).

Gallatin County's values at risk are further detailed in other local plans, including the 2018 update to the county's Hazard Mitigation Plan (HMP), which is the parent document to this CWPP. The Gallatin County Growth Policy and the City of Bozeman Community Plan discuss local values at risk, including public infrastructure, parks, trails, wildlife, fisheries and cultural resources.

5.3.2 Community Development and Growth Trends

Over the last decade, Gallatin County has experienced unprecedented growth, resulting in rapid changes in land use, ownership, and development patterns. The county's population has increased 25% between 2010 and 2018 (U.S. Census, 2019), and it has more than doubled since 1990. To address current and anticipated changes, the county must consider how wildfire can be further integrated into planning and development decisions. The following examples of growth trends and patterns highlight these issues:

- / Transition of agricultural, forest and riparian lands to developed land is expanding the WUI. Development that is proposed in hazardous areas (as shown on the wildfire hazard maps) should incorporate strategies that reduce risk to structures and life safety.
- / Continued growth in seasonal and second-home markets, particularly in amenity and/or vacation-driven areas, including Big Sky, Bridger Canyon/Brackett Creek, Jackson Creek, Hebgen Basin, and edges of the Gallatin Valley (Gateway, Hyalite/Sourdough Canyon areas, Bear Canyon and Springhill area), can affect how stakeholders plan for local response needs and resources. Community outreach and engagement with part-time residents and visitors must accommodate unique considerations such as seasonal schedules, population changes, or varying levels of awareness regarding wildfire concerns.

Figure 5-1 (Headwaters Economics, 2018) shows changes in home construction within Gallatin County from 1990 – 2016. A quick review of these maps shows that home construction has increased substantially not only near population centers, but also in less-developed areas such as Big Sky, Bridger Canyon, and the Clarkston area. In the five-year period (2013-2018), the number of building inspections within the City of Bozeman more than doubled from 18,627 to 37,583 (City of Bozeman, 2019). This substantial increase in building activity within Bozeman is indicative of continued outward expansion of the city towards undeveloped lands and, due to potential increases in the building approval process timeline within city limits, may also result in increased development pressure in more rural areas of the county.

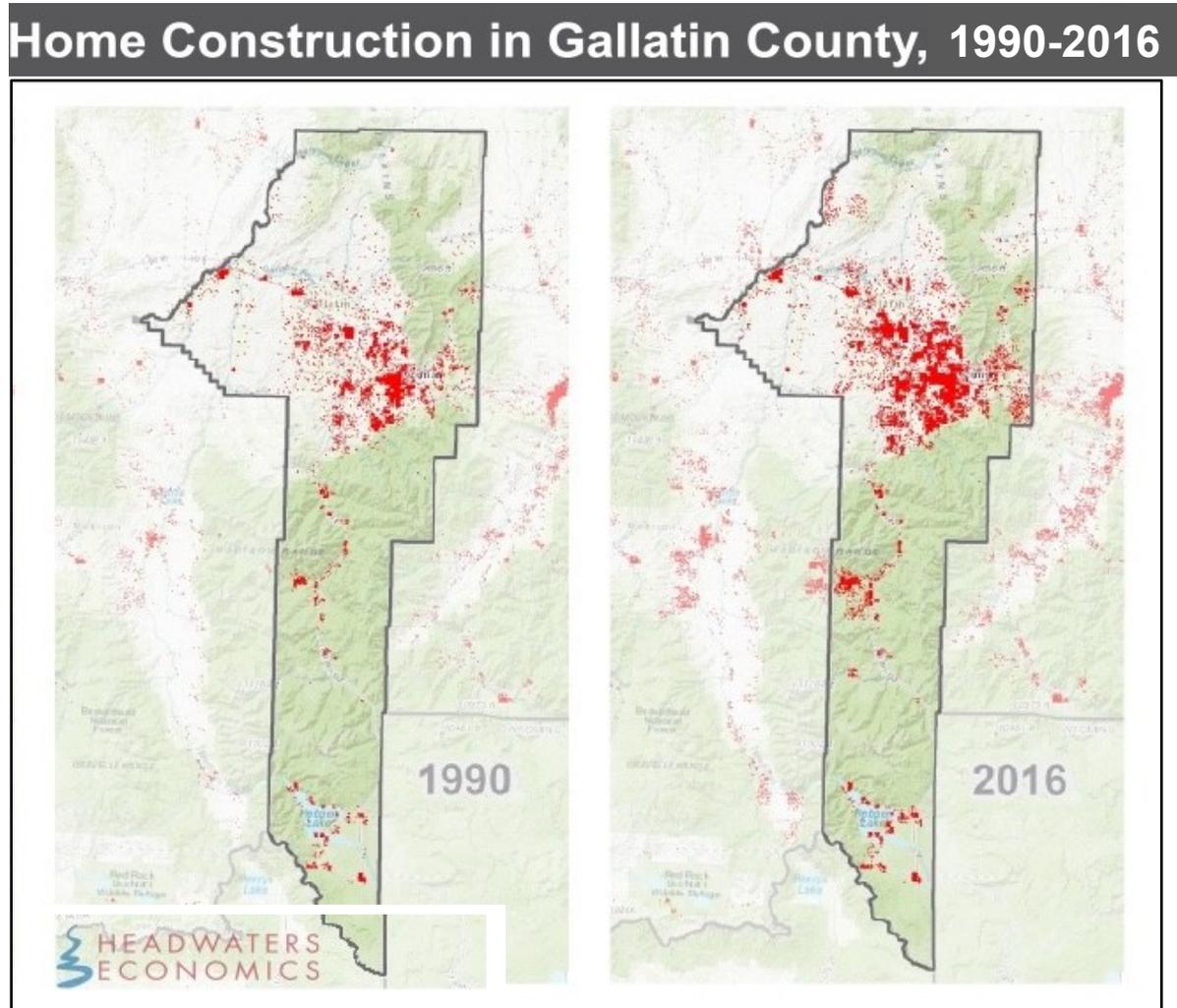


Figure 5-1. Change in home construction within Gallatin County, 1990- 2016 (Headwaters Economics, 2018).

5.3.3 Increasing Community Fire Adaptation and Reducing Structural Ignitability

Recent and future development changes, combined with an increase in wildfire risk, highlight the need for Gallatin County to develop strategies to plan for and adapt to wildfire. Strategies must consider a range of current and future community values, including existing and new homes, vulnerable populations, critical facilities and infrastructure, recreational amenities, and businesses. Strategies can take the form of new policies and regulations, education and outreach activities, or other actions that encourage community members to prepare for, and adapt to, future wildfire events.

Headwaters Economics, 2018, Gallatin County's Economy, Growth, and Open Space. <https://headwaterseconomics.org/wp-content/uploads/Report-Gallatin-Countys-Economy.pdf>. Accessed April 2019.

The following strategies are focused on leveraging existing county documents and programs to increase their visibility across the county. The actions listed are also captured in the Action Table (Section 6.3).

5.3.3.1 Promote Implementation of WUI Policies and Regulations

Important county and city planning documents already incorporate wildfire topics into their goals and actions, including the Gallatin County Growth Policy, City of Bozeman Community Plan, Belgrade Growth Policy, Gallatin Triangle Planning Study, and the 2018 update to the Gallatin County HMP. For example:

- / The Gallatin County Growth Policy, Chapter 3.14, **Goal #1: Protect Human Life and Property from Natural Hazards**, includes a policy to, “*Consider the adopted Gallatin County Community Wildfire Protection Plan when reviewing development proposals.*” Development is discouraged in areas prone to wildland fire, and mitigation of fire hazards such as creation of defensible space for each structure is encouraged prior to final plat approval. Section 5.2 of the Growth Policy also provides guidelines for the **Evaluation of Subdivisions According to Primary Criteria**, one of which includes the proposed subdivision’s susceptibility to wildfire.
- / The Bozeman Community Plan (2009) mentions the potential for increased risk of wildfire due to climate change. **Appendix G: Environmental Quality and Critical Lands** includes a section that discusses the WUI (**Section G.1.8**). It promotes an understanding of fire behavior, including fire intensity, vegetation characteristics, and building materials, and the need to keep these factors in mind when building structures in wildfire-prone areas. References are provided for preparing a CWPP. The Bozeman Fire Department coordinates with other fire departments in the valley through mutual aid agreements to address issues of regional concern such as the WUI. The City of Bozeman has been a participating jurisdiction in hazard mitigation planning and preparation of a countywide HMP since the initial plan was completed in 2006. The City was also a key participant in development of the initial Gallatin County CWPP in 2006. The Community Plan describes how planning mechanisms, such as subdivision regulations, can address future development parameters including defensible space, access, and water supply. Local codes also provide improved opportunities for public health, first-responder and community safety, and welfare.
- / The 2018 HMP update contains a goal to **Reduce Impacts from Wildfire (Goal 1)**. The objectives under Goal 1 focus on: 1) reducing private losses in the WUI, 2) increasing the understanding of wildfire hazard areas, and 3) assisting property owners in completing mitigation measures. Specific projects identified include: 1) fuels mapping and reduction, 2) conducting individual WUI assessments, 3) developing defensible space requirements and subdivision regulations for wildfire/WUI areas, and 4) creating fire-adapted communities through implementation of programs such as Firewise. This CWPP update (2018) has been closely tied to the 2018 HMP update and is designated as an official Attachment (**Attachment A**) to the HMP.

This CWPP leverages existing HMP goals to advance risk reduction by providing more detailed implementation guidance. CWPP actions are designed to build on current WUI community actions in the Growth Policies/Plans and 2018 HMP update.

Specific CWPP actions to address development include:

1. Update the Gallatin County Growth Policy land use maps and local area plans, as needed and appropriate, using wildfire hazard area information to steer growth away from more hazardous areas.

- / Incorporating tools such as the updated WUI map and wildfire hazard assessment maps during growth policy updates and implementation ensures consistency of information among plans and informs future policy decisions.
- 2. Utilize zoning and zoning districts to implement land use map updates and guide growth to more appropriate areas and away from more hazardous areas.
 - / Using proactive strategies to guiding growth to appropriate locations helps reduce risk to future neighborhoods and homes.
- 3. Utilize land conservation tools such as the open space bond to buffer developed areas from wildfire.
 - / Creating land buffers between development and the natural environment makes it easier to manage vegetation near homes and neighborhoods and protect these homes during future wildfire events.
- 4. Adopt development/subdivision regulations that require best possible hazard mitigation to protect communities, neighborhoods, fire professionals, and properties/structures in the event of a wildfire. Propose updated development regulations that incorporate best practices, including changes to building code, zoning code, and subdivision regulations.
 - / Evaluating the effectiveness of regulatory tools, such as the building code, subdivision regulations, and zoning regulations, helps determine whether additional fire protection measures are necessary at each applicable scale. This could include exploring the adoption of a wildland-urban interface code. The county risk assessment can be used to further inform this action.

5.3.3.2 Promote Wildfire Mitigation Strategy Education and Outreach

Mitigation strategies are often most accepted when the public and stakeholders understand their effectiveness. For example, scientific tests on building construction identify which types of materials are most effective during ember storms. When the public understands this information, they are more likely to see the value in supporting building codes that include ignition-resistant construction requirements.

Mitigation strategies are also effective in addressing existing development through education and outreach activities to help increase awareness and motivate voluntary actions. Activities can target residents and landowners, youth, industry professionals, and elected officials.

Many education and outreach efforts are already underway by local, state, and federal stakeholders. For example, many of the local fire departments/districts host a variety of community outreach functions during the year (e.g., barbeques, pancake breakfasts) where a wide range of educational materials regarding wildfire preparation and safety are often available. Outside experts from various local (Gallatin County Extension), state (DNRC), and federal (USFS) agencies are often available at these functions to provide additional outreach to the public. These activities and types of information available can include:

- / Conducting free property assessments to help residents identify hazards;
- / Displaying up-to-date maps that show wildfire hazard areas and the WUI;
- / Providing current fire season forecasts or updates on any active wildfire events;
- / Promoting participation in Fire-Adapted Community programs to encourage neighborhood activities and local recognition;

- / Delivering Ready, Set, Go! program messages to residents to help them prepare for wildfires and evacuations; and,
- / Working with local schools on youth education programs.

Both the HMP update and various Growth Policy/Planning documents can also be used to message and promote the use of educational materials to residents and landowners in hazardous areas.

Specific CWPP actions to enhance outreach and education include:

1. Engage with industry professionals on mitigation programs, activities, and opportunities to improve public education and outreach across neighborhoods and communities.
 - / Many industry professionals, including insurance agents, realtors, developers, and builders, can play a critical part in understanding their role in educating other audiences in community fire adaptations. Working with these groups by providing specific resources and messaging materials can accelerate local efforts to reduce wildfire risk.
2. Update County Extension and Emergency Management websites with best practice wildfire education resources and materials.
 - / Gallatin County Extension and Emergency Management can post the latest wildfire planning, protection and mitigation resources in the form of informational brochures, interactive maps that highlight local risk, educational videos, or other guides to help the public learn more about wildfire. Topics may include home construction and landscaping techniques, evacuation planning and preparedness, and parcel-level risk assessments.
3. Promote having neighborhoods and communities develop mitigation activities and evacuation plans through programs such as Firewise USA and Ready, Set, Go!
 - / Risk reduction happens at multiple scales. Neighborhoods are encouraged to engage in mitigation planning. This can be through participation in national programs, such as Firewise USA or Ready, Set, Go! (supported through local agencies), and the development of local CWPPs or similar fire plans.

5.4 INCREASING WILDFIRE RESPONSE THROUGHOUT GALLATIN COUNTY

The multiple agencies responsible for fire suppression have developed an excellent network of interagency support and cooperation. Generally, suppression resources have been able to respond to wildland fire occurrences with adequate resources using this system. However, some concern is expressed over the ability of this system to sustain itself in the face of climate change and the current trend of decreasing volunteer capacity, aging firefighters, and decreasing budgets.

In addition to fire suppression resources available within the fire protection districts, seasonal wildland firefighters are available through USFS, DNRC, and the National Park Service (NPS). These resources are trained and equipped to fight wildland fire only; unlike the fire protection district resources, they are not trained or equipped to fight a structure fire.

5.4.1 Emergency Preparedness/ Evacuation

Emergency evacuation procedures are the responsibility of local law enforcement agencies. During a wildfire, the Incident Commander (in coordination and with the approval of the agencies having jurisdiction) will recommend evacuation. Routes and locations of shelters/centers depend on fire location and numbers of affected individuals, and so must be made on a case-by-case basis at the time of the incident.

5.4.2 Ready, Set, Go! Program

The Ready, Set, Go! Program seeks to develop and improve the dialogue between fire departments and the residents they serve. The program helps the fire service teach individuals who live in high-risk wildland fire areas—and the WUI—how to best prepare themselves and their properties against wildland fire threats. The program’s tenets help residents be Ready with preparedness understanding, be Set with situational awareness when fire season begins, and to Go early, when necessary, as fire threatens. The Ready, Set, Go! Program works in complementary and collaborative fashion with the Fire Adapted Communities Coalition and existing wildland fire public education efforts and amplifies their message to individuals about emergency preparedness and evacuation. Ready, Set, Go! provides educational and outreach materials to limited English speakers, standardizing the message and ensuring that information is accurate across languages.



Figure 5-2 Ready, Set, Go! Infographic.

5.4.3 Primary Stakeholders and Response Areas

5.4.3.1 Fire Departments, Districts and Service Areas

Most communities within Gallatin County are within the jurisdiction of one of the legally recognized, community-based rural fire districts, fire service areas, or a municipal fire department (refer to **Table 5-3**). Within the WUI Intermix areas there is often concurrent fire protection, with a local fire agency and the USFS both having jurisdiction. Of the 15 fire protection agencies across Gallatin County, only the Bozeman Fire Department has an all-paid staff. Big Sky, Central Valley, Hebgen Basin and Hyalite fire districts have a mix of paid and volunteer firefighters. The other districts rely completely on citizen volunteers to respond to structure fires, wildland fires, and other emergencies such as medical calls and vehicle accidents on the interstate or secondary roads within each jurisdiction.

Table 5-3. List of fire departments, districts, and service areas in Gallatin County.

Fire Dept., District or Service Area	Communities Served	Response Area (acres)
Amsterdam	Amsterdam, Churchill, Camp Ck. Road, area north of Hwy. 84 (MM 17-26)	56,795
Big Sky	Big Sky Meadow/Mtn. Village, Moonlight/Spanish Peaks Clubs, Hwy. 191 (MM 43-61)	37,293 (incl. area in Madison Co.)
Bozeman	within city limits of Bozeman, I-90 (MM 304-309), Montana State University	12,873
Bridger Canyon	Bridger Canyon (Hwy. 86 MM 4-17), Bridger Bowl, parts of Jackson Ck/Brackett Ck Rds.	26,071
Central Valley	City of Belgrade, Hwy. 85 (Jackrabbit Ln.), I-90 (MM 292-304), Springhill/Rocky Mt. Rd., Gallatin R. (4 Corners-Central Park), E. Gallatin R. (Riverside-Dry Ck.), Dry Creek Rd., Bozeman-Yellowstone International Airport	117,718
Clarkston	Clarkston, E. side of Missouri R. (Eustis north to Lombard), west side of Horseshoe Hills	15,333
Fort Ellis	I-90 E. of Bozeman (MM 309-322), Bozeman Trail Rd., Bear & Kelly Canyon, Trail Ck Rd.	38,810
Gallatin Gateway	Gallatin Gateway, Hwy. 191 (MM 61-Four Corners), area south of Hwy. 84 (MM 20-29), Cottonwood Rd. east from Hwy. 191 to Cottonwood Canyon, portions of Gooch Hill Rd.	67,917
Gallatin River Ranch	residential ranch community in Horseshoe Hills, north side of Gallatin/E. Gallatin Rivers	7,475
Hebgen Basin	W. Yellowstone, Hebgen & Quake Lakes basin with approx. borders of Hwy. 20 (south), Hwy 191 (east), Township 10-11S line (north), Madison Co. (west), & Idaho (southwest)	126,666
Hyalite	areas south/west of Bozeman, from Triple Tree to Four Corners; also responds into Sourdough/Leverich/Hyalite Canyons and numerous county “islands” within Bozeman	29,431
Manhattan	Town of Manhattan, I-90 (MM 283-292), Gallatin R./E. Gallatin R. north of T1N/T1S line	37,597
Sedan	Sedan, Hwy. 86 (MM 22-31[Park County line]), east side of Flathead Pass	32,248
Three Forks	City of Three Forks, Madison R. valley south to Black’s Ford, Headwaters St. Park, I-90 (MM 272-283), Note: district extends NW into Broadwater County from T3N to south	108,403 (incl. area in Broadwater Co.)
Willow Creek	Willow Creek, south/east side of Jefferson R., Sappington Jct., Note: district extends NW into Jefferson County	75,510 (incl. area in Jefferson Co.)
County Fire	All lands (private and state) outside of local fire districts/service areas or a municipal department, and which is not protected by the federal government (USFS or NPS)	268,344

5.4.4 Additional Stakeholders

In addition to fire suppression resources available within the fire protection districts, wildland firefighters are available through the USFS and NPS. These resources are trained and equipped to fight wildland fire only; unlike the fire protection district resources, they are not trained or equipped to fight a structure fire.

5.4.5 Suppression Responsibilities

When an unplanned wildland fire (wildfire) is discovered in Gallatin County, a fire response crew from a local fire response jurisdiction or a USFS ranger district may respond, depending on its location. The Gallatin County 911 Communications Center is the Public Safety Answering Point (PSAP) for the county. For wildfire incidents occurring on federal lands, the Bozeman Interagency Dispatch Center (BZC) leads communication with response resources. Each dispatch center utilizes the “closest forces” concept in wildland fire dispatch.

This allows for the closest suppression resource to be sent, regardless of boundaries or jurisdictional responsibilities. This arrangement is particularly helpful at either end of the federally recognized fire season (typically mid-June through mid-September). When wildfires start early, as they did in 2000 (the first wildfire occurred on March 15), federal fire crews are not yet employed so it is the community-based firefighter who is often first on scene.

5.4.6 Interagency Agreements

Through pre-established mutual aid agreements, all fire suppression resources in Gallatin County are authorized to leave their jurisdictional boundaries to aid a requesting agency partner. In addition, Montana statute allows these resources to assist throughout the state when needed/possible. This is primarily accomplished through the South Central Montana Zone Multi-Agency Coordinating Group (MAC), within the Northern Rockies Coordinating Group (NRCG), which allows all responsible jurisdictional agencies to coordinate resources and priorities throughout the South-Central Montana Zone during fire season. The South Central Zone MAC Group consists of representatives from:

- / CGNF;
- / National Park Service;
- / Gallatin County Fire Warden;
- / Montana DNRC; and,
- / Park County (MT).

Automatic mutual aid agreements are also utilized between most Gallatin County agencies sharing boundaries. These agreements are triggered by verbal request, typically at the time of first dispatch.

5.4.7 Current Suppression Challenges and Limitations

5.4.7.1 Areas without Organized Fire Response

Approximately 268,300 acres of private land in Gallatin County are located outside of an organized fire protection agency (i.e., local fire district or service area), a DNRC-mandated wildland fire protection district, or Affidavit lands. Under the terms of a cooperative agreement between the county commissioners and the State of Montana, the county has assumed fire suppression responsibility in these areas from the State. The County Fire Warden and Rural Fire Chief (one-and-the-same for purposes of this CWPP) is responsible for coordinating response to wildland fires that occur within these areas and has historically relied on mutual aid from adjacent fire districts and/or MT DNRC, through the Cooperative Fire Control Program (Co-op Program). Lands without fire protection are located throughout Gallatin County (Rural Fire Protection Operating Plan, 2015). Some of the larger examples include the following areas, where specific Response Plans have been developed: Spanish Creek, Norris, Horseshoe, Maudlow, Sedan, and islands of unprotected land surrounded by, or adjacent to, Bozeman city limits (primarily off Griffin and Bridger Drives).

5.4.7.2 Volunteer Firefighter Capacity

The current national trend of a decreasing and aging pool of volunteer firefighters has been expressed as an increasing local concern for most department that rely on volunteer responders. Most departments can currently function adequately when faced with in-district emergencies. However, as county and regional wildland fires grow in frequency and size—increasing the need for solid mutual and automatic aid support—and compounded with the demand of other year-round response commitments (medical calls, structure fires, rescues, motor vehicle accidents)—the majority of these departments are unable to provide support to the desired level.

5.4.7.3 Response Area Commitment

Many of the local fire jurisdictions are responsible for significant response areas, some extending into neighboring counties and many with multiple communities or values at risk. There is some concern regarding the capacity during heavy, multiple fire load scenarios that these resources are relied upon for mutual aid will be over-committed.

5.4.8 Improving Response

Specific CWPP actions to improve wildfire response capabilities are:

1. Promote and support fire departments/districts to increase capacity and funding. Stakeholders and all levels of government should work together in developing a coordinated approach to increasing capacity and funding with respect to wildfire response.
2. Develop local Pre-Suppression Plans (“Pre-Plans”) to improve wildfire response effectiveness and strategy. A Pre-Plan is an intelligence packet that assists incident commanders, operations section chiefs, structural protection specialists, division supervisors, group supervisors, taskforce leaders, and strike team leaders in formulating a plan based on current conditions, forecast weather conditions, locations and maps of fixed resources (e.g., water supply, safety zones), and listings of additional resources and contact information. The main objective of the plans is to have a well-thought out strategy based on the conditions and deployment of resources before the fire occurs. Wildland firefighting and structural protection/defense requires judgment based on many years of actual firefighting experience, and must be responsive to actual, on the ground conditions. No amount of classroom training or simulations can prepare an individual for the leadership required during large, fast-moving fires, but preparing the available information in ways that can facilitate that leadership is key to effective wildfire response.

6 CWPP ACTION PLAN

6.1 OVERVIEW

This chapter of the document focuses on putting the CWPP into action. The first section provides an overview of stakeholders associated with this CWPP to promote an understanding of the roles and responsibilities for each entity. The second section provides an action plan to guide stakeholder implementation activities. This ensures the CWPP process continues to move forward in a meaningful way. Finally, additional guidance on plan maintenance outlines key considerations to ensure the plan stays current and is updated regularly, so that it remains relevant into the future.

6.2 STAKEHOLDER ENGAGEMENT

Each stakeholder in the CWPP shares a role, whether it be agency-, landowner-, or non-governmental organization-affiliated. The success of this CWPP requires the participation of all stakeholders to engage in understanding of their role and taking appropriate actions.

6.2.1 Residents and Homeowners

Gallatin County's local fire protection agencies cannot always protect everyone from wildfire, especially if homeowners haven't taken responsibility for ensuring firefighters can safely work in the area. By creating a defensible space around individual homes and communities, reducing hazardous fuels in the surrounding area, and ensuring that access routes will support fire apparatus, homeowners can greatly increase the likelihood that their property will survive a wildland fire event. It is imperative that homeowners work with their neighbors and communities to increase safety and reduce risk for the greater protection of all.

6.2.2 Fire and Emergency Responders

There are several resource and capability enhancements identified by the fire and emergency responders in Gallatin County that are related to response and treatment of defensible space, egress/ingress, capacity, equipment, and planning efforts (see **Appendix A: Fire District and Department CWPP Surveys**). Implementation of response action items will rely on either the isolated efforts of the rural fire districts or a concerted effort by Gallatin County to achieve equitable enhancements across all districts.

6.2.3 Civic and Community Leaders

Wildfire mitigation efforts must be supported by a set of policies and regulations, where appropriate, as well as guidelines at the county and community levels that maintain a solid foundation for safety and consistency. They must also be supported by the public infrastructure, economy, and value system. Critical infrastructure refers to the communications, transportation, power lines, and water supply that service a region or a surrounding area. All these components are important to southwest Montana and to Gallatin County specifically. These critical networks are, by definition, a part of the WUI in the protection of people, structures, infrastructure, and unique ecosystems. Without supporting infrastructure, a community's structures may be protected, but the economy and way of life lost.

6.2.4 Forest and Land Managers

There are many land management issues associated with wildfire that can have lasting effects on natural resources as well as communities and local economy. In addition to the immediate responsibility of wildfire suppression, land managers at all levels; local, state, and Federal, must also be aware of and plan for the

long-term impacts and implications of wildland fire on the landscape. Undeveloped private and public lands serve many purposes and are highly valued for their ability to provide habitat for animals, recreational and hunting opportunities, timber resources, etc. Wildfire affects each of these values in different ways some of which are very direct such as loss of timber assets, but some are subtle and take place over long periods of time such as the loss of native seed sources due to repeated burning. Increasing cohesiveness of land management across boundary jurisdictions will reduce risk and increase efficiency. **Table 6-1** identifies roles that community members at the local, state, and federal levels play in Gallatin County’s resilience to wildfire and risk reduction.

Table 6-1. Overview of CWPP Stakeholder Roles

Stakeholder Group	Overview of Roles
City, County, and Local Partners	
Elected Officials	<ul style="list-style-type: none"> <li>/ Gallatin County Commission has jurisdiction and power to represent the county and has care of county property, management, and business concerns. <li>/ Gallatin County Sheriff is an elected position that has responsibility to enforce state and county laws and statutes. <li>/ The Bozeman city commission, and the city and town councils and mayors of Belgrade, Manhattan, Three Forks, and West Yellowstone are elected to represent citizens of those jurisdictions.
Gallatin County Planning Department	/ County Planning and Community Development is responsible for long-range planning, administration of subdivision, zoning, and floodplain regulations, and coordination of community and economic development efforts.
Local Fire Depts. and Fire Districts/Service Areas	/ Responsible for community fire response and protection services for local jurisdictions across Gallatin County.
Gallatin County Rural Fire (“County Fire”)	/ Responsible for fire response and protection services on county lands that are outside of local fire agency (local fire dept./district/service area) or federal jurisdiction.
Gallatin County Emergency Management	/ Coordinates interagency emergency response within Gallatin County and provides outreach, planning, and training for “all hazards” and all phases of emergency management – mitigation, preparedness, response, and recovery.
Gallatin City-County Health Department	/ Protects and promotes the health of county citizens and the environment, including air quality.
Gallatin County residents, landowners, and community organizations	<ul style="list-style-type: none"> <li>/ Responsible for personal property and engaging in community projects. <li>/ Community councils participate in planning process by facilitating communication between communities and local government. <li>/ Includes private landowners; and citizens/entities with large land holdings (e.g., Turner, Yellowstone Club)

Non-governmental stakeholders	<ul style="list-style-type: none"> / Includes stakeholders from Southwest Montana Building Industry Association, Gallatin Association of Realtors, and other industry professionals. / Volunteer organizations, resource conservation groups (e.g., Gallatin Conservation District, Greater Gallatin Watershed Council, Gallatin River Task Force), community development groups (e.g., HRDC, Big Sky Community Organization), Chambers of Commerce, utilities (Northwestern Energy), Gallatin Valley Land Trust, university partners, and other business entities.
MSU Extension – Gallatin County	<ul style="list-style-type: none"> / MSU Extension – Forestry, Natural Resources / Fire Adapted Communities Learning Network
State Partners	
Montana Dept. of Natural Resources & Conservation	/ Protects lives, property, and natural resources from wildfire by providing safe and effective services to Montana’s citizens as well as leadership, coordination, and resources to the state’s wildfire organizations.
FireSafe Montana	/ Private, non-profit organization coordinates and supports a statewide coalition of diverse interests working together to help Montanans make their homes, neighborhoods, and communities fire safe.
Federal Partners	
U.S. Forest Service (USFS)	<ul style="list-style-type: none"> / Manages land in Gallatin County within Custer-Gallatin National Forest (CGNF), Bozeman and Hebgen Ranger Districts, and a small portion of the Helena National Forest (HNF), Townsend Ranger District, in the northernmost extent of the county. Also manages USFS lands bordering Gallatin County: in Park County (CGNF, Bozeman, Gardiner and Yellowstone Ranger Districts); in Broadwater County (HNF, Townsend Ranger District); in Madison County (CGNF, Bozeman Ranger District, and Beaverhead-Deer Lodge National Forest, Madison Ranger District), and in Idaho (Caribou-Targhee National Forest, Ashton/Island Park Ranger District).
U.S. Dept. of Interior, Bureau of Land Management	/ Manages public lands out of the Butte Field Office.
U.S. Fish and Wildlife Service	/ Administers environmental stewardship programs and services to guide conservation, development and management of national fish and wildlife resources.
National Park Service, Yellowstone National Park	/ Manages land within Yellowstone National Park, a portion of which is located in southern Gallatin County.

6.3 ACTION PLAN

The proposed action plan consists of categories that correspond to the three emphasis areas of the Cohesive Strategy, including 1) fire adapted communities; 2) fire resilient landscapes; and 3) response. Natural vegetation and habitat restoration activities are incorporated into fuels reduction projects. As part of the Cohesive Strategy and intent of the CWPP, an additional category was added, 4) Risk Assessment.

Recommendations are organized into categories and listed in order of priority. Projects that address human safety issues will be of a higher priority than projects that benefit homes. No home is worth a life. Creation of a proactive, knowledgeable community through education and outreach was identified as one of the most important tools to be included in the plan. The objective of this portion of the plan is to provide information to landowners and visitors to increase knowledge and understanding of fire related issues. The creation and maintenance of fire resilient landscapes, both around homes and across the landscape, is also a priority. Implementing defensible space around homes is a priority for fuels reduction, as well as fuels reduction across the general landscape.

The following Action Plan (**Table 6-2**) captures actions listed throughout this CWPP. Each action has a proposed lead(s) responsible for advancing the action, a priority level for implementation, a desired timeframe for completion, and any additional notes relevant to support the action. Many actions may relate to one another.

Table 6-2. Action Plan

Action	Lead(s)	Priority	Timeframe	Notes
Risk Assessment				
1. Develop the Gallatin County Risk Assessment, including WUI mapping.	County, USFS	High	2019 (as part of CWPP update)	
2. Compile parcel-level assessment data to inform and complete risk assessment, increase first-responder information and encourage public engagement	Fire Districts, County	High	2020/ongoing	/ Utilize Situation Analyst Montana system for standardization
3. Creation of a Cohesive Strategy Working Group (CSWG) in Gallatin County	USFS, Custer Gallatin Working Group (CGWG), Gallatin Forest Partnership	High	2020	
4. Update risk assessment information annually to include changing development patterns, changes in fire suppression resources and methods, effects of recent fires, and other information to facilitate risk modeling and project prioritization	CSWG	Medium	Initiate in 2021	/ A high-quality, current risk assessment is important to facilitate good decision making. Annual updates would aid in project planning, depending on data availability, and staff and financial resources.

Action	Lead(s)	Priority	Timeframe	Notes
Resilient Landscapes				
5. Review and identify priority landscapes, and design and prioritize potential treatment options, to reduce fire intensity, structure ignition, and negative wildfire impacts to identified assets.	CSWG	High	2021	/ To follow after creation of CSWG
6. Advance prescribed fire activities.	CSWG	Medium	2022	
Fire Adapted Communities				
7. Update County Growth Policy and land use map and local area plans, as needed and appropriate, using wildfire hazard information to steer growth away from more hazardous areas.	County Planning	High	To occur according to Planning Dept. timelines for Growth Policy updates	/ Update growth policies and develop future land use maps and local area plans, using wildfire hazard information to steer growth away from more hazardous areas
8. Implement land use map updates using zoning to guide growth to more appropriate areas and away from more hazardous areas	County Planning	Medium	Occurs in conjunction with land use mapping updates	
9. Use land conservation tools such as the open space bond to buffer developed areas from wildfire.	County Planning	Medium	Ongoing (dependent on availability of Open Space funds)	
10. Adopt development regulations that require best possible hazard mitigation to protect communities, neighborhoods, fire professionals, and properties/structures, in the event of a wildfire. Propose development regulations that incorporate best practices, including changes to building code, zoning code, or subdivision regulations.	County Planning	Medium	Timeframe based on future growth and development patterns	/ Consider inclusion of structural building or WUI codes in the County Growth Policy update that is currently in progress
11. Engage with industry professionals on mitigation programs, activities, and opportunities to improve public education and outreach across neighborhoods and communities.	County Planning, All Hazard All Discipline (AHAD) Group	Medium	Initiate in 2020	/ Engage realtors, insurers, developers, and builders to provide info. on fire-safe const. and landscaping

Action	Lead(s)	Priority	Timeframe	Notes
12. Update GCEM website with wildfire education, resources and material.	GCEM	Medium	Ongoing	
13. Promote neighborhood and community development activities and evacuation plans through programs such as Fire Adapted Communities and Ready, Set, Go!	GCEM	High	Ongoing	/ Meet with and provide neighborhood groups with risk assessments, educational materials, and fuels reduction cost-sharing to assess conditions and assist with improvement and mitigation at the neighborhood scale
14. Apply for and administer cost-sharing grants to assist private landowners with fuels reduction, structural improvements, and other projects designed to lessen risk from wildfire.	CSWG	Medium		/ Work with private landowners on fuels reduction and ‘hardening’ of homes with fire resistant roofing, siding, vents, and other improvements to reduce loss potential
Improved Response				
15. Promote and support local fire districts to increase capacity, funding opportunities, and volunteer firefighter recruitment and retention.	GCEM	High	Ongoing	/ Provide support through County Fire Program with RFA and other financial programs
16. Develop pre-suppression action plans – Improve response by planning wildfire suppression tactics, first responder and community safety and preparedness.	County Fire, local fire districts	High	Ongoing (several pre-plans are already in-place)	/ Develop fire district-level wildfire pre-plans for Incident Management teams and local fire response

Action	Lead(s)	Priority	Timeframe	Notes
17. Improve response by widening and/or resurfacing roads or adding second egress to communities that have only one egress/ingress route.	Local RIDs, HOAs/subdivisions	High	Based on available funding and scheduled maintenance activities	<ul style="list-style-type: none"> Identify communities' egress/ingress on a case by case basis and recommend actions to improve road access and provide safer response Refer to Appendix A for CWPP questionnaire responses regarding egress/ingress issues
18. Improve response by implementing addressing at a neighborhood level	Local communities, neighborhoods, and fire districts			
19. Establish, maintain, and update wildland fire response agreements (mutual aid) between the county, local fire districts, and state and federal agencies.	GCEM, County Fire, local fire districts	Medium	Ongoing	

6.4 PLAN UPDATES AND MAINTENANCE

The continuous nature of implementing the Action Plan makes this CWPP a living document. Different stakeholders will be meeting at various times to discuss and implement applicable actions—some of which may take months or years to complete, while others could be ongoing. An annual review of the action plan with lead stakeholders, as identified in the Action Plan, will help further coordinate and re-evaluate the status of actions. More significant updates should occur on an as-needed basis, such as following significant fire seasons.

A major update to this CWPP should be anticipated on a five-year cycle to coincide with the next Hazard Mitigation Plan (HMP) update. This increases the efficiency of stakeholder participation and further links content between both plans. The major CWPP update will include:

- / Review of all content to confirm accuracy of information, such as recent wildfire history, changes to demographics and land ownership, relevance of Cohesive Strategy themes, fire response areas, and more;
- / Re-assessment of risk inputs based on changes to the local environment;
- / Confirmation of participating stakeholders, stakeholder roles, and signatories; and,
- / Updated Action Plan based on revised content, updated risk assessment, and stakeholder interests.

Importantly, keeping the plan updated also helps share successes with other stakeholders and community members as Gallatin County increases its capacity for resilient landscapes, fire adapted communities, and efficient response capabilities.

Appendix A:

Stakeholder and Public Engagement during CWPP Update Process

The CWPP update began in September 2017 and occurred over the course of 20 months. During this update process, two separate CWPP drafts were shared with stakeholders and the public via the Gallatin County Emergency Management (GCEM) website. Input and comments were requested from the public. The process was coordinated by the project consultant, RESPEC, who worked with the GCEM Director, Mr. Patrick Lonergan, to develop the document. The CWPP update occurred concurrently with the 5-year update of the Gallatin County Hazard Mitigation Plan (HMP), and many of the stakeholder meetings and presentations addressed content and planning for both the CWPP and HMP updates. This appendix provides an overview of the CWPP engagement process.

Initial Stakeholder Outreach (September 2017)

An initial set of 120 stakeholders were contacted to inform them about the CWPP and HMP updates and invite their participation in the update process. Stakeholders represented county and city departments, local elected offices, federal and state agencies, fire departments/districts/service areas, and nonprofit organizations.

Stakeholder Kick-Off Meetings (October 2017)

Stakeholders had the opportunity to meet face-to-face with representatives from the project consultant, Mr. Mike Rotar and Ms. Libby Ellwood of RESPEC, at kick-off meetings held at seven different locations across Gallatin County, October 12 – 24, 2017. Meeting locations included: Bozeman, Belgrade, Manhattan, Three Forks, West Yellowstone, Big Sky, and Gallatin Gateway. A kick-off presentation of the project was also provided at the bi-monthly, All Hazards All Discipline (AHAD) meeting in Bozeman on October 26, 2017. The purpose of the kick-off meetings was to introduce the update process for the two documents. Specific to the CWPP, discussion focused on the value of CWPPs and their local application, guiding documents and legislation, and status of Wildland-Urban Interface (WUI) mapping in the county.

Approximately 40 different stakeholders attended one or more of these kickoff meetings.

Stakeholder Meeting, AHAD Group (June 27, 2018)

A presentation describing progress with the CWPP update was given by RESPEC at a regular AHAD meeting on June 27, 2018. The primary purpose of this meeting was to discuss several topics specific to CWPP development, including WUI definitions, and review of several wildfire risk assessment mapping products. These risk assessment maps (Wildfire Intensity, Probability, and Relative Hazard) are developed based on existing physical parameters (weather data, topography, and vegetation) combined with computer simulation of fire starts and potential growth development. The resulting output and mapping provide spatial context and information regarding where different wildfire management and mitigation strategies are likely to be most effective.

15 stakeholders attended this meeting.

Stakeholder Webinar, WUI Discussion (November 27, 2018)

A webinar was held to discuss an initial draft of the WUI Mapping with stakeholders. WUI mapping was presented and the methodology for developing the map was explained. A further refined map of the Relative Wildfire Hazard was also presented.

Approximately 12 stakeholders attended this webinar.

Public Review and Comment Period (January - June 2019)

Initial drafts of both the CWPP and HMP documents were made available for public and stakeholder review in early January 2019. Draft documents were posted to the GCEM website and comments and comments and input requested.

A final draft of the combined document (HMP update, with CWPP update included as an Attachment) were made available for public and stakeholder review in late May 2019. Documents were posted to the GCEM website and input and comments requested from the public.

Stakeholder Meeting (January 22, 2019)

A presentation describing progress with the HMP and CWPP updates was provided by RESPEC on January 22, 2019. For the CWPP update topics included a final review of the WUI definition to be used, draft final WUI mapping and wildfire hazard mapping, and including WUI definitions, and a discussion of the Cohesive Strategy approach to be used to develop the CWPP Action Plan. A schedule was presented that outlined milestones throughout the coming months for completion of the document updates.

A **CWPP Questionnaire** was developed and sent to all local fire departments/districts/service areas to solicit input regarding identification of existing conditions within their jurisdictions, and to identify strategies for mitigation of wildland fire risk and to improve response capabilities. Copies of the returned questionnaires are provided in this Appendix.

12 stakeholders attended this meeting.

CWPP Questionnaires were returned by 5 local fire jurisdictions, and by the Custer-Gallatin National Forest

NOTE: Comments received during the public review and comment period in June 2019 will be reviewed, and incorporated into the CWPP update, as appropriate, prior to final CWPP adoption.