

**2018 UPDATE TO  
MULTI-HAZARD MITIGATION PLAN**

**FOR**

**Lincoln COUNTY, MONTANA**

**AND**

**CITIES OF Libby & TROY**

**TOWN OF EUREKA**

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## LIST OF ACRONYMS

BNSF	Burlington Northern-Santa Fe Railroad
CARD	Center for Asbestos-Related Disease
CDBG	Community Development Block Grant
CDC	Centers for Disease Control
CDP	Census Designated Place
CEIC	Census and Economic Information Center
CPAW	Community Planning Assistance for Wildfire
CPRI	Calculated Priority Risk Index
CRS	Community Rating System
CWPP	Community Wildfire Protection Plan
DEQ	Department of Environmental Quality (Montana)
DES	Disaster and Emergency Services
DFIRM	Digital Flood Insurance Rate Map
DHS	U.S. Department of Homeland Security
DMA	Disaster Mitigation Act
DNRC	Department of Natural Resources and Conservation (Montana)
DOI	U.S. Department of Interior
DPHHS	Department of Public Health and Human Services (Montana)
EAP	Emergency Action Plan
EMA	Emergency Management Agency
EMPG	Emergency Management Performance Grant
EMS	Emergency Medical Services
EPA	U.S. Environmental Protection Agency
EPCRA	Emergency Planning and Community Right to Know Act
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FMA	Flood Mitigation Assistance
FMAG	Fire Management Assistance Grant
FP&S	Fire Prevention & Safety
FWP	Fish, Wildlife and Parks (Montana)
FWS	U.S. Fish and Wildlife Service
GIS	Geographic Information Systems
HES	High Emission Scenario
HMGP	Hazard Mitigation Grants Program
IBC	International Building Code
IDSA	Infectious Disease Society of America
IRC	International Residential Building Code
IT	Information Technology
LA	Libby Amphibole
LARP	Libby Asbestos Response Plan
LEPC	Local Emergency Planning Committee
LERRD	Lands, Easements, Rights-of-way, Relocations, and Disposal





## LIST OF ACRONYMS

LES	Low Emission Scenario
LiDAR	Light Detection and Ranging
MDOR	Montana Department of Revenue
MDT	Montana Department of Transportation
MHMP	Multi-Hazard Mitigation Plan
NCDC	National Climatic Data Center
NFIP	National Flood Insurance Program
NFPA	National Fire Protection Association
NOAA	National Oceanic and Atmospheric Administration
NRIS	Natural Resource Information System (Montana)
NTSB	National Transportation Safety Board
NWS	National Weather Service
OSHA	Occupational Safety and Health Administration
OU	Operable Unit
PDM	Pre-Disaster Mitigation
PDMC	Pre-Disaster Mitigation Competitive (grants program)
PPE	Personal Protective Equipment
RC&D	Resource Conservation and Development
RFA	Rural Fire Assistance
SHELDUS	Spatial Hazard Events and Losses Database for the United States
SPLC	Southern Poverty Law Center
TRI	Toxic Release Inventory
USACE	United States Army Corps of Engineers
USDA	United State Department of Agriculture
USDOT	United States Department of Transportation
USFS	United States Forest Service
USGS	United States Geologic Survey
VFD	Volunteer Fire Department
WRN	Weather Ready Nation
WUI	Wildland Urban Interface



SECTION 1. INTRODUCTION

1.1 Background

In response to the requirements of the Disaster Mitigation Act of 2000 (DMA 2000), Lincoln County, the cities of Libby and Troy, and the Town of Eureka have developed this Multi-Jurisdictional Multi-Hazard Mitigation Plan (MHMP). DMA 2000 amends the Stafford Act and is designed to improve planning for, response to, and recovery from, disasters by requiring State and local entities to implement hazard mitigation planning and develop MHMPs. The Federal Emergency Management Agency (FEMA) has issued guidelines for development of Hazard Mitigation Plans. The Montana Disaster and Emergency Services (DES) supports plan development for jurisdictions in the State of Montana.

**Hazard Mitigation** is any sustained action taken to reduce or eliminate the long-term risk and effects that can result from specific hazards.

FEMA defines a **Hazard Mitigation Plan** as the documentation of a state or local government evaluation of natural hazards and the strategies to mitigate such hazards.

Lincoln County completed and adopted a Pre-Disaster Mitigation (PDM) Plan in 2004 to help guide and focus hazard mitigation activities. The original PDM Plan was updated in 2011. The county, working together with Tetra Tech Inc., has prepared this 2018 MHMP update to satisfy the requirement that hazard mitigation plans be updated every five years. The updated Lincoln County MHMP profiles significant hazards to the community and identifies mitigation projects that can reduce those impacts. The purpose of the updated MHMP is to promote sound public policy designed to protect residents, critical facilities, infrastructure, private property, and the environment from natural and man-made hazards. The updated Lincoln County MHMP includes resources and information to assist residents, organizations, local government, and others interested in participating in planning for natural and man-made hazards. This 2018 updated MHMP supersedes the 2011 and 2004 PDM Plans.

1.2 Authority

The Lincoln County MHMP update has been developed pursuant to the requirements in the Interim Final Rule for hazard mitigation planning and the guidance in the State and Local Plan Interim Criteria under DMA 2000. The 2018 MHMP also meets guidance developed by FEMA in March of 2013 for Local Mitigation Planning.

The Lincoln County Board of County Commissioners have adopted this MHMP. Also adopting the MHMP are the incorporated communities of Libby, Troy and Eureka. The community of Rexford elected not to adopt this Plan; instead, falling under the county’s umbrella. These governing bodies have the authority to promote sound public policy regarding natural and man-made hazards in their jurisdictions. Copies of the signed resolutions are included as **Appendix A** to this plan. The MHMP was adopted at the regularly scheduled county commission and city/town council meetings, which were open to the public and advertised through the typical process the jurisdictions use for publicizing meetings.

Lincoln County will be responsible for submitting the adopted MHMP to FEMA for review. Upon acceptance by FEMA, Lincoln County and the incorporated communities of Libby, Troy, and Eureka will remain eligible for mitigation project grants and post-disaster hazard mitigation grant projects.



### **1.3 Acknowledgements**

Many groups and individuals have contributed to development of the Lincoln County MHMP. The Lincoln County Emergency Management Agency (EMA) provided support for all aspects of plan development including providing digital locations for the critical facilities and infrastructure used in the MHMP analysis. The MHMP Planning Team, comprised of various members of the Local Emergency Planning Committee (LEPC) and other community members, met on a regular basis to guide the project, identified the hazards most threatening to the county, developed and prioritized mitigation projects, reviewed draft deliverables and attended the public meetings. The local communities participated in the planning process by attending public meetings and contributed to plan development by reviewing and commenting on the draft plan.

### **1.4 Scope and Plan Organization**

The process followed to prepare the Lincoln County MHMP update included the following:

1. Review and prioritize disaster events that are most probable and destructive,
2. Update and identify critical facilities,
3. Review and update areas within the community that are most vulnerable,
4. Update and identify new goals for reducing the effects of a disaster event,
5. Review and identify new projects to be implemented for each goal,
6. Review and identify new procedures for monitoring progress and updating the MHMP,
7. Review the draft MHMP, and
8. Adopt the updated MHMP.

The MHMP is organized into sections that describe the planning process (Section 2), community profile (Section 3), risk assessment (Section 4), mitigation strategies (Section 5) and plan maintenance (Section 6). Appendices containing supporting information are included at the end of the plan.



## SECTION 2. PLANNING PROCESS

The updated Lincoln County MHMP is the result of a collaborative effort between Lincoln County, the incorporated communities of Libby, Troy and Eureka, utilities, local agencies, non-profit organizations, businesses, and regional, state and federal agencies. The planning effort was facilitated by the contractor, Tetra Tech. Public participation played a key role in development of goals and mitigation projects, as outlined below. For the purposes of this planning effort, the public is defined as residents of Lincoln County, local departments, state and federal agencies that support activities in the county, neighboring communities and local partners.

### 2.1 MHMP Planning Team

All project stakeholders were invited to be part of the Planning Team to update the Lincoln County MHMP. Stakeholders who participated on the Planning Team members are listed in **Appendix B**. The affiliation of these participants is presented in **Table 2.1-1**.

**Table 2.1-1. Agencies Represented on the MHMP Planning Team**

Organization / Department / Position	Type of Organization
Lincoln County / EMA Director	County Government
Lincoln County / Commissioner	County Government
Lincoln County / Public Health	County Government
Lincoln County / Chief Forester	County Government
Lincoln County / Planning Dept. / Floodplain Administrator	County Government
Lincoln County / Information Technology	County Government
Lincoln County / Sheriff's Office	County Government
City of Libby / Police	City Government
City of Libby / Mayor	City Government
City of Libby / Chief Administrative Officer	City Government
City of Troy / City Council	City Government
Town of Eureka / Mayor	Town Government
Town of Rexford / Clerk	Town Government
Bull Lake Rural Fire District	County Fire
Libby Rural Fire Dept.	County Fire
West Kootenai Volunteer Fire Dept.	County Fire
Montana Dept. Natural Resources & Conservation - Fire	State Government
Montana Disaster & Emergency Services - Western District	State Government
Montana Highway Patrol	State Government
National Weather Service	Federal Government
U.S. Army Corps of Engineers	Federal Government
U.S. Border Patrol	Federal Government
U.S. Forest Service / Kootenai National Forest / Fire	Federal Government
Can-Am Search & Rescue	Local Organization
Mountain View Nursing Home	Assisted Living Facility

Responsibilities of the Planning Team included attending conference calls to discuss update of the Plan, providing data for analysis in the risk assessment, attending public meetings, providing input and feedback on mitigation strategies, reviewing the draft plan document, and supporting the plan



throughout the adoption process. The MHMP Planning Team will assist the Lincoln County EMA in updating the plan in the future.

The Planning Team met five times over the course of the project; once to rank the hazards, once to review critical facility and hazard impact maps, and three other times to update the mitigation strategy, capability assessment, and review the plan maintenance process. Weekly conference calls were held during October 2018. In advance of each conference call, an agenda and/or material to be discussed (i.e. hazard maps, hazard ranking matrices, example mitigation strategies, etc.) were emailed to meeting participants. Planning Team conference call notes are presented in **Appendix B**.

## **2.2 Project Stakeholders**

The planning process was initiated by preparing a stakeholders list of individuals whose input was needed to help prepare the MHMP. Planning partners on the stakeholders list received a variety of information during the project including meeting notices, documents for review, and the draft mitigation strategy. **Appendix B** presents the stakeholders list for this project.

On the County level, project stakeholders included: County Commissioners, Attorney, Emergency Manager, Sheriff's Office, Road Foremen, Public Health, Planner/Floodplain Administrator, Environmental Health, Volunteer Fire Departments (VFDs), Extension Agent, Information Technology Dept., and the Superintendent of Schools. These entities participated in the planning process by either providing data, attending public meetings, participating on the Planning Team, and/or reviewing the draft MHMP.

Stakeholders from the City of Libby included: Mayor, City Council, City Administrator, Building Inspector, Planner/Floodplain Administrator, VFD, Police Dept., Road and Street Dept., and Water and Wastewater Treatment Plant operators. These entities participated in the planning process by either providing data, attending public meetings, participating on the MHMP Planning Team, and/or reviewing the draft MHMP.

Stakeholders from the City of Troy included: Mayor, City Council, City Clerk, Public Works Dept, Fire Marshal, VFD, and 911 Dispatch. These entities participated in the planning process by either providing data, attending public meetings, participating on the MHMP Planning Team, and/or reviewing the draft MHMP.

Stakeholders from the Town of Eureka included: Mayor, Town Council members, 911 Dispatch, Town Clerk, VFD, and Police Dept. These entities participated in the planning process by either providing data, attending public meetings, participating on the MHMP Planning Team, and/or reviewing the draft Plan.

Stakeholders from the Town of Rexford included the Clerk who participated on the MHMP Planning Team and reviewed the draft Plan.

Stakeholders from federal agencies included representatives from: the National Weather Service (NWS), the U.S. Forest Service (USFS), U.S. Army Corps of Engineers (USACE) and U.S. Border Patrol. These agencies provided data for plan development, attended meetings, participated on the MHMP Planning Team, and/or reviewed the draft MHMP.



Stakeholders from state agencies included representatives from: Montana DES, Montana Dept. of Natural Resources and Conservation (DNRC), and Montana Dept. of Transportation (MDT). These entities participated in the planning process by providing data for the plan, participating on the MHMP Planning Team, and/or attending the public meetings.

Non-governmental stakeholders including non-profits/local organizations, utilities, the media, and other businesses in the community. Businesses included: Glacier Bank and the Burlington Northern-Santa Fe Railroad. Utilities included: Lincoln Electric Co-op. Media sources included: KLCB/KTNY radio. Non-profits and local organizations included: The Good Samaritan, Flathead Economic Policy Center, and Search and Rescue. Several of these entities attended the public meetings, participated on the MHMP Planning Team, and/or reviewed the draft MHMP update.

Planning partners from adjoining jurisdictions included emergency managers from Flathead and Sanders Counties in Montana, and Boundary County Idaho. These entities did not offer input on the Lincoln County MHMP update.

### **2.3 Review of Existing Plans and Studies**

At the initiation of the project, planning documents, regulations, and studies completed for Lincoln County, the incorporated communities of Libby, Troy, and Eureka, and the region were obtained from relevant websites and/or provided by the EMA office. The documents were reviewed in order to determine how hazard mitigation is integrated into local land use planning, ordinances, and programs. Contributing plans, regulations, and studies reviewed by the contractor included:

#### **DAMS**

1. Emergency Action Plan, Flower Creek Dam, May 2016
2. Emergency Action Plan, Glen Lake Dam, December 2014
3. Emergency Action Plan, Costich Dam, December 2014
4. Emergency Action Plan, Kootenai Development Impoundment Dam, March 2018
5. Emergency Action Plan, Lake Creek Dam, December 2016
6. Emergency Action Plan, Libby Dam, February 2016

#### **EMERGENCY OPERATIONS**

1. Lincoln County Emergency Operations Plan

#### **FLOODPLAIN STUDIES**

2. Flood Insurance Study, Lincoln County (Unincorporated Areas), 2006
3. Flood Insurance Study, City of Libby, 2006
4. Flood Insurance Study, Town of Eureka, 1979
5. Parmenter Creek Flood Hazard Reduction Project, 1998

#### **GROWTH POLICIES, ORDINANCES & REGULATIONS**

6. Lincoln County Growth Policy, 2009
7. Lincoln County Subdivision Regulations, 2015
8. Lincoln County Floodplain Regulations, 2006



9. Lincoln County Lake Shore Regulations, 2014
10. City of Libby Growth Policy, 2010
11. City of Libby Subdivision Regulations, 2011
12. City of Libby Zoning Regulations, 1987
13. City of Troy Growth Policy, 2008
14. Town of Eureka Strategic Plan, 2016

#### **HAZARD MITIGATION**

15. Lincoln County Pre-Disaster Mitigation Plan, 2011
1. Lincoln County Community Wildfire Protection Plan, 2013

Data obtained from the plan and regulation review was incorporated into various sections of the MHMP. A summary of land use implementation tools is presented in *Section 3.7.1*. *Section 4.0* contains reference to the plans and ordinances affecting hazard management and future development. *Section 6.3* includes a discussion on how mitigation can be implemented through existing programs.

### **2.4 Project Website**

A website was set up at the start of the project to provide information to the Planning Team, project stakeholders and the citizens of Lincoln County. The project website can be viewed at: [www.countypdm.com/](http://www.countypdm.com/) (password: Libby). The website remained active during the course of the project through adoption of the Plan.

The website contained a Home page and pages for: Contacts, Planning Team, Meetings, Draft MHMP, Maps, and References. The Home page contained a letter inviting participation in development of the Plan. The Contacts page contained information on Tetra Tech and county personnel involved in management of the project. The Planning Team page contained the meeting schedule, agendas, handouts, and notes from the Planning Team meetings. The Meetings page contained the public meeting schedule, notes, handouts and presentations from the public meetings. The Draft MHMP page contained sections from the draft plan for stakeholder review. The Maps page contained draft versions of the critical facility and hazard maps prepared for the project. The References page contained the 2011 Lincoln County PDM Plan, the 2013 Lincoln County Community Wildfire Protection Plan (CWPP), FEMA guidance on preparing multi-jurisdictional hazard mitigation plans, the FEMA Region 8 Plan Review Guidance dated September 2011, FEMA Mitigation Ideas Handbook dated January 2013, FEMA Local Mitigation Planning Handbook dated March 2013, and links to the State of Montana Multi-Hazard Mitigation Plan and FEMA websites.

### **2.5 Project Meetings**

Two public meetings were conducted during development of the MHMP. The first public meeting was held to kick-off the project. At this meeting, the 2011 PDM Plan was reviewed and hazard events over the past five years were discussed. The second public meeting was held to review the draft risk assessment and mitigation strategy and to kick-off the public review period for the draft MHMP. Sign-in sheets, handouts, presentations, and meeting notes are contained in **Appendix B** and posted on the project website.



The first public meeting was held on September 24, 2018 at City Hall in Libby and on September 25, 2018 at the Fire Station in Eureka. The September 19, 2018 edition of the The Western News newspaper published an article on the MHMP project and advertised the public meeting. A meeting notice was sent via e-mail to all project stakeholders and the meeting was posted on the project website. Media documentation is presented in **Appendix B**.

During the first public meeting, Tetra Tech made a presentation which reviewed and analyzed each section of the 2011 Lincoln County PDM plan, outlined the background and rationale for updating the Plan, the process and methodology for the update, and the project schedule. **Table 2.5-1** describes the outcome of the 2011 PDM Plan review.

**Table 2.5-1. Review and Analysis of 2011 Pre-Disaster Mitigation Plan**

2012 PDM Sections	How Reviewed and Analyzed
Section 1 - Introduction	Reviewed existing section through discussion at kick-off meeting. No analysis needed.
Section 2 - Planning Process	Reviewed and analyzed existing section through discussion during public meeting and Planning Team meetings. Reviewed and updated critical facility maps and bridges. Re-scoring hazards using Calculated Priority Risk Index. Reviewed and updated hazards updating sections with recent hazard data.
Section 3 - Community Profile	Updated section with climate change discussion. Incorporated discussion on updated land use planning mechanisms.
Section 4 - Risk Assessment and Vulnerability Analysis	Reviewed and analyzed existing section through discussion during kick-off meeting and Planning Team conference calls. Reviewed and updated hazards, critical facilities and vulnerable populations. Updated section with recent hazard data.
Section 5 - Mitigation Strategy	Reviewed by Planning Team during the course of kick-off meeting and subsequent conference calls. New projects developed, existing projects re-worded and/or deleted, completed projects documented.
Section 6 - Capability Assessment	Reviewed and analyzed existing section through discussion during public meeting and Planning Team meetings. Expanded section incorporating additional programs and funding sources.
Section 7 - Plan Maintenance Procedures	Reviewed and analyzed existing section through discussion during kick-off meeting and Planning Team conference calls. Determined that plan maintenance procedures outlined in previous plan were implemented but not documented.

The meeting presentation was placed on the project website for stakeholders who could not attend the meeting (**Appendix B**). Approximately 19 individuals attended the public meeting held in Libby and 13 attended the meeting in Eureka. Meeting attendees included representatives from: Lincoln County EMA, Sheriff's Office, Information & Technology Dept., Public Health Dept., the County Forester, the Floodplain Administrator-County Planner, a County Commissioner, and the Chief Administrative Officer; representatives from the City of Libby included the Mayor, Police Dept., Fire Dept., and Chief Administrative Officer; representatives from the City of Troy included the Mayor and City Clerk; representatives from the Town of Eureka included a member of the Town Council, Fire Dept., and Town Clerk; state and federal representatives included the MT Highway Patrol, U.S. Forest Service and U.S. Border Patrol; other meeting attendees included representatives from the Bull Rural Fire District, West Kootenai Fire Protection Company, Can-Am Search & Rescue, Good Samaritan Society-Mountain View Nursing Home, NW Community Health Center, and a member of the public.





Public meetings to review the draft MHMP were held on November 9, 2018 at the Lincoln County EMA office in Libby and at the Eureka Fire Station. The meetings were held at the beginning of the draft plan public review period. Notice of the meetings was sent via email to the project stakeholders, advertised in an article in the October 30, 2018 edition of The Western News and on the project website. Tetra Tech presented results of the MHMP risk assessment at the meeting as well as the updated mitigation strategy. Thirteen (13) individuals attended the public meetings including representatives from the Lincoln County EMA, the County Health Dept., Sheriff's Dept., and the County Forester; the City of Libby's Chief Administrative Officer and a Police Dept. representative; the mayor of Eureka; representatives from the Eureka, Bull Lake and West Kootenai VFDs; a representative from the Good Samaritan Society-Mountain View Nursing Home; and one member of the public. Public meeting attendees networked before and after the meeting, listened to the presentation, and asked questions.

## **2.6 Plan Review**

The planning process for the MHMP began on September 6, 2018 and lasted approximately four months. The project was on an accelerated schedule in order to qualify for a wildfire mitigation grant due by the end of the calendar year.

The public was provided at least two opportunities for comment prior to adoption of the Plan. The first opportunity was during the drafting process. A notice was placed in the newspaper, on the project website, and communicated via social media regarding availability of the draft MHMP. The notice indicated the plan was available in hard copy at the Lincoln County EMA office, electronically on compact disk (CD) upon request, or available on the project website. An e-mail announcement was sent to the project stakeholders with instructions on how to comment on the draft MHMP. The draft document was produced with line numbers to aid in the review process. Reviewers were asked to submit their comments on the draft plan to the Lincoln County EMA Director after a review period of approximately three weeks (November 9 to 30, 2018). Comments received from the first public review of the draft were addressed in a plan revision (final draft) which was submitted to Montana DES and FEMA for review and concurrence.

At this point a second opportunity was provided to the public to comment. The final draft plan was posted on the project website and stakeholders were notified of its availability via an e-mail for a second review from December 15, 2018 to February 15, 2019, an approximate 60-day review period. Any final comments were addressed in a revision and the final version of the plan was provided to the Lincoln County Board of County Commissioners, the Cities of Libby and Troy, and the Town of Eureka for adoption. After adoption, copies of the resolutions were submitted to Montana DES and FEMA.

Future comments on the MHMP should be addressed to:

Lincoln County Emergency Management Agency  
512 California Ave.  
Libby, Montana 59923  
(406) 293-6295



## SECTION 3. COMMUNITY PROFILE

This section of the MHMP presents an overview of Lincoln County and the communities of Libby, Troy and Eureka, the jurisdictions which comprise this plan. Information is provided on the characteristics of the county, the economy and land use patterns, and presents the backdrop for this mitigation planning process.

### 3.1 Physical Setting

Lincoln County is located in the northwest corner of Montana and has an area of 3,675 square miles. It is bounded by Flathead County on the east, Idaho's Boundary and Bonner Counties on the west, Sanders County on the south, and the Canadian Province of British Columbia on the north. Lincoln County has two distinct geographic areas and population centers; North and South Lincoln County. South Lincoln County contains Libby, the county seat, Troy, and the Yaak Community along with Bull Lake and the Chain of Lakes communities. North Lincoln County, also known as the Tobacco Valley, includes the Towns of Eureka and Rexford and the unincorporated towns of Trego, Fortine, West Kootenai and Stryker. Libby is the largest community in Lincoln County followed by Eureka and Troy.

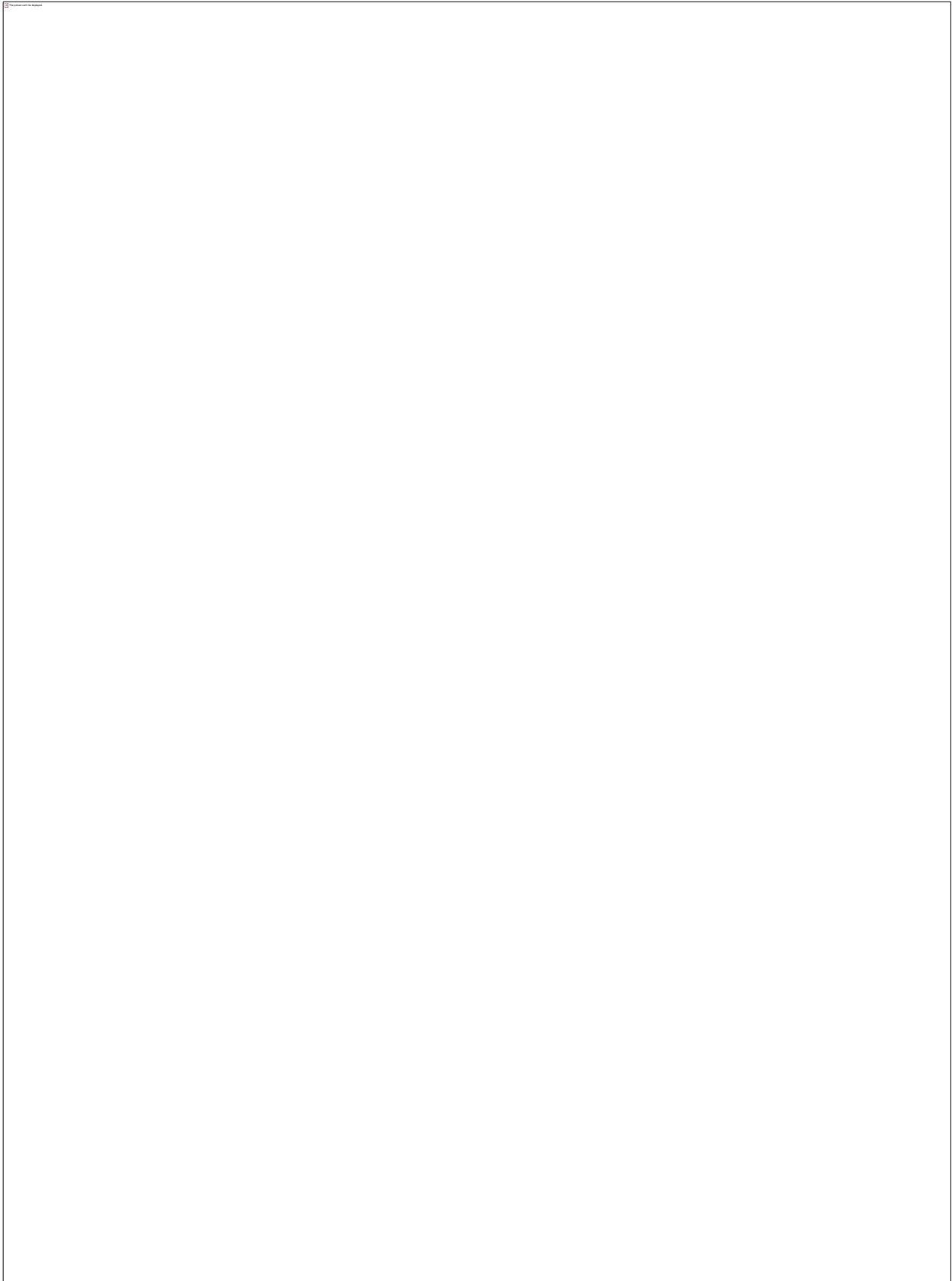
The Kootenai River flows south out of Canada into Lincoln County and leaves the state west of Troy. Lake Koocanusa, a reservoir created by the Libby Dam on the Kootenai River has a length of 48 miles within Lincoln County and reaches another 42 miles into British Columbia. The Yaak and Fisher Rivers are tributaries to the Kootenai and their valleys deeply dissect the surrounding mountains. The Bull River flows south and joins the Clark Fork River in Sanders County. **Figure 1** presents a location map of Lincoln County.

Lincoln County consists of intense topographic variations. Large spans of mountainous, coniferous forests dominate the watersheds. Valleys in the northern portion of the county are characterized by significant expanses of grasslands. The elevation in Lincoln County ranges from about 1,820 feet above sea level where the Kootenai River enters Idaho, to over 8,700 feet in the Cabinet Mountain Wilderness. Lincoln County is predominantly a rural county.

Landownership in Lincoln County includes some very large landowners. The U. S. Government owns 73.5 percent of the land, most of which is administered by the Forest Service. Private land accounts for 22 percent of the ownership and includes large blocks of land owned by Weyerhaeuser Company and Stimson Lumber Company. The State of Montana owns 3 percent of land in Lincoln County.

Most of the development in Lincoln County has occurred in the larger valleys, and the majority of the private land is located in these areas. The five largest valleys, in order of current population and intensity of development, include: the Libby Valley, the Tobacco Valley, the Troy/Lake Creek Valley, the Yaak Valley, and the Fisher River Valley. **Figures 2 and 2A** presents ownership and population density, respectively, in Lincoln County.









## 3.2 Climate

Lincoln County is located within the region generally classified as a modified west coast marine and continental climate. Summers are sometimes hot and dry, and winters are cold. Mean annual precipitation averages approximately 30 inches for the Kootenai River basin, generally increases with increasing altitude, and varies from 14.5 inches/year at Eureka, to an estimated 60 or more inches on some of the higher mountains. Annual snowfall varies from about 40 inches in the lower valleys to an estimated 300 inches in some mountain areas. Most of the snow falls during the November-March period, but heavy snowstorms can occur from mid-September to early May.

Much of the annual runoff occurs in spring with the snowmelt. The annual pre-dam hydrograph for the Kootenai River at the City of Libby shows a distinct peak in the April-July time period. Since 1972 when the Libby Dam was completed, flood flows on the Kootenai River have been modified by the dam. Relatively low runoff predominates the rest of the year, especially in the dry late summer, and in winter when much of the precipitation falls as snow and remains frozen.

Average high and low temperatures in Libby in January are 33° F and 21° F, respectively. The lowest temperature recorded at Libby was -46° F and the record high was 56° F. Often the coldest temperatures occur at sheltered valley locations when winds are light, but extreme wind chill situations occur almost every winter when windy conditions coincide with very low temperatures. Rapid warm-ups during the winter and early spring or rain on snow events can lead to significant snow melt and flooding of small streams and rivers and/or ice jam flood problems. January “thaws” are well-known in Libby and are often when flooding occurs.

Average high and low temperature in July in Libby are 87° F and 49° F, respectively. Both summer and winter temperatures vary considerably with elevation and local topography. Brief spells with temperatures above 100°F can occur. The high temperature recorded in Libby was 110° F (2007). Extended periods with temperatures above 90° F occur every few years. Freezing temperatures can occur during any month of the year but are rare in low elevation from June through August.

Summer thunderstorm events with heavy precipitation of up to several inches can occur and may be accompanied by high winds, hail and local flooding. Winter storms with heavy snowstorms can occur from October to April. These storms can produce up to several feet of snow and are often made more severe as temperatures are warmer, and therefore the snow is heavier and more difficult to travel in and remove. Winter storms may be accompanied by high winds resulting in blizzard conditions.

**Table 3.2-1** presents climate statistics for the City of Libby.

Table 3.2-1. Lincoln County Climate Statistics – Libby

Category	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average High (°F)	33	41	52	62	72	79	87	88	76	58	40	32
Average low (°F)	21	22	27	32	38	45	49	47	40	33	29	21
Avg. Precipitation (Inches)	1.77	1.26	1.42	1.1	1.61	1.81	1.22	0.91	1.18	1.5	2.44	2.2
Average Snowfall (Inches)	10	7	3	0	0	0	0	0	0	1	6	19

Source: <https://www.usclimatedata.com/climate/libby/montana/united-states/usmt0202>



For the purposes of this mitigation plan, weather is of interest when it threatens property or life and thus becomes a hazard. The NWS provides short-term forecasts of hazardous weather to the public and also records weather and climatic data. Further information on NWS weather warning criteria is presented in the individual hazard profiles in *Section 4.0*.

### Climate Change

Climate change will affect the people, property, economy and ecosystems of Lincoln County in a variety of ways. The most important effect for the development of this plan is that climate change will have a measurable impact on the occurrence and severity of natural hazards.

In 2017, the Montana Climate Assessment was published (Whitlock, Cross, Maxwell, Silverman, and Wade, 2017) which explored how future projected climate change would affect agriculture, forestry and water resources to better plan for the future. Two emission scenarios were evaluated. The low-emissions scenario (LES) assumes that global emissions of the greenhouse gases that cause changes in climate conditions peak in the year 2040 and then decline. The high-emissions scenario (HES) assumes that global emissions of greenhouse gases remain largely unabated through the 21<sup>st</sup> century. Climate projections from FEMA and NOAA were analyzed by county for the State of Montana MHMP (2018). A summary of climate projections for the State and Lincoln County are presented below.

Montana is projected to continue to warm in all geographic locations, seasons, and under both emission scenarios throughout the 21<sup>st</sup> century. By mid-century, Montana temperatures are projected to increase by approximately 4.5-6.0°F while by the end of the century, Montana temperatures are projected to increase 5.6-9.8°F. These state-level changes are larger than the average changes projected globally and nationally. From 1950 to 2006, Lincoln County annually observed an average 0.6 days above 95 degrees. At mid-century, Lincoln County is projected to see 3.6 and 4.7 more 95-degree days according to the LES and HES, respectively. At the end of the century, Lincoln County is projected to see 5.7 and 26.3 more 95-degree days according to the LES and HES, respectively.

Across the state, precipitation is projected to increase in winter, spring, and fall, and decrease in summer. Between 1950 and 2006, Lincoln County annually observed an average 3.8 days with more than 1-inch of precipitation. At mid-century, Lincoln County is projected to see 1.8 and 1.3 fewer 1-inch precipitation days according to the LES and HES, respectively. At the end of the century, Lincoln County is projected to see 1.9 fewer and 0.3 more 1-inch precipitation days, according to the LES and HES, respectively.

Climate change indicators provide useful information about what is occurring in complex systems. These indicators include temperature and growing season, rainfall intensity, snowpack, streamflow, stream temperature, wildland fire occurrence, plants life cycle events, and forest health. The hazard profiles in *Section 4* provide climate change implications as they relate to hazard mitigation.

## 3.3 History

Like many western counties, Lincoln County developed around the railroad after discovery of gold in the Cabinet Mountains. In August 1867, miners working Libby Creek discovered gold. In October 1889, a lode containing silver and lead was discovered. It was named Snowshoe and would be a major producing mine for the Libby area by the late 1890s. On May 3, 1892 the first train on the Great



Northern Railroad arrived in Libby. The City of Libby grew quickly in the early 1900s and logging quickly became an important part of the community's culture, due to its setting. Libby Townsite Company brought in the first sawmill and cut timber to build Libby in its present location. In the spring 1906 construction began of the Dawson Lumber Company sawmill at the site of the former Stimson Sawmill (Kootenai Business Park) bringing workers and their families to the city in greater numbers. The Dawson mill was the first successful sawmill to operate in the Libby vicinity and several lumber companies owned the mill at Libby over the next 100 years. Railroad logging began in the area in 1907 with the construction of a logging railroad along Libby Creek. For more than a century Lincoln County was tied to the timber industry.

Lincoln County was founded in 1909 and named for President Abraham Lincoln. It was once part of Flathead County until residents of Libby and Eureka petitioned the state legislature for separation. Libby won an election over Eureka to host the county seat.

The Libby Dam, approximately 17 miles north of town, was constructed from 1966 to 1972 employing 2000 workers during peak construction periods. The 422-foot tall dam holds back 90 miles of water in Lake Koocanusa. Its generators can provide enough electricity for the daily needs of 500,000 average homes.

In the early 1900s vermiculite deposits were first located by prospectors on Rainy Creek northeast of Libby. In 1919, E.N. Alley bought the Rainy Creek claims and started the Zonolite Company. The W. R. Grace Company bought the mine and operated it from 1963 until its closure in 1990. While in operation, the vermiculite mine in Libby may have produced 80 percent of the world's supply of vermiculite and was a significant employer of many Libby townspeople. In late 1999, the mine was blamed for asbestos-related deaths and illnesses among Libby residents and former employees due to exposure to asbestos-tainted vermiculite. The Environmental Protection Agency (EPA) was called in and Libby was added to EPA's National Priorities List in October 2002. EPA then established a program to inspect all properties in Libby. Over 8,000 properties were inspected with over 2,600 cleanups completed. EPA has determined that cleanup of the asbestos-contaminated properties is nearly complete. Further details on the Libby Asbestos Superfund Site are included in *Section 4.2* (Wildfire) and *Section 4.5* (Disease).

### 3.4 Critical Facilities and Infrastructure

Critical facilities provide essential products and services that are necessary to preserve the welfare and quality of life and fulfill important public safety, emergency response, and/or disaster recovery functions. Critical facilities include the 911 emergency call center, emergency operations centers, police and fire stations, public works facilities, sewer and water facilities, communication sites, hospitals and shelters. Critical facilities also include those facilities that are vital to the continued delivery of community services or have large vulnerable populations. These facilities may include buildings such as the jail, law enforcement center, public services buildings, senior centers, community corrections center, the courthouse, and juvenile services building and other public facilities such as hospitals and schools.

Critical facilities in Lincoln County are identified in **Appendix C**. Replacement values were collected where readily available; however, time and resource constraints prohibited the collection of values





for all structures. A geographic information system (GIS) layer of the critical facilities was used in the hazard risk assessment. This GIS layer should be updated on a regular basis for use in future analysis. Further details on the county's critical facilities and infrastructure from the Lincoln County and City of Libby Growth Policy (2009), the City of Libby Growth Policy (2010), the City of Troy Growth Policy (2008), the Town of Eureka Strategic Plan (Rural Economic Design, 2016), and the 2011 Lincoln County PDM Plan (Tetra Tech, 2011) are presented below.

### **3.4.1 Water and Wastewater Services**

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The community of Libby receives its water from the Flower Creek drainage which originates in the Cabinet Mountains. The city owns two reservoirs on Flower Creek. The Upper Flower Creek reservoir is primarily used for storage and is located about 3.5 miles southwest of Libby. The Lower Flower Creek Dam is used as a diversion point for raw water intake. A new Flower Creek dam was completed in 2016 to replace the old 1936 CCC construction dam. Further details on this facility are presented in *Section 4.9*. The City of Libby has a new 500,000-gallon water treatment facility.

The wastewater facility for Libby operates by natural biological reduction. The plant is an extended aeration system with an oxidation ditch, two final clarifiers, digester, and sand beds for drying. Effluent is discharged into the Kootenai River. The capacity of the treatment plant is approximately 500,000 gallons a day or a population of 3,500. The city annexed the Cabinet Heights area and extended wastewater service to the 103 homes there in 2010.

Troy relies on groundwater for its water supply. The community has two active wells and a third one is scheduled to come on line. Storage capacity for water is 325,000 gallons. Wastewater treatment for Troy is handled by three aerobic lagoons.

The Town of Eureka has a water treatment plant that was constructed in 2003. The water source is a combination of surface water and groundwater. The town has a 500,000-gallon storage tank. There are approximately 550 households on the system. The wastewater treatment system for Eureka is comprised of an aeration pond and two storage ponds. The plant was upgraded in 2001 and has a capacity of 21 million gallons for storage. In 2004 with the construction of the new high school, the Town of Eureka installed a lift station that serves the entire Midvale residential area and the Highway 93 business corridor.

The Town of Rexford relies on two wells for its water supply and has a 150,000-gallon water storage tank. The distribution system was installed in 1978 and there are approximately 80 customers on the system. Several community water systems have been developed to address water issues where development has taken place. The Rexford wastewater treatment plant is comprised of an aerated lagoon and storage pond. Water levels are maintained through evaporation and irrigation on surrounding land. The town has a special use permit from the USFS to operate the system on Forest Service land. The collection system is gravity flow to a lift station at the aeration pond.

### **3.4.2 Utilities**

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Lincoln Electric Co-op provides service in Eureka and north Lincoln County. Flathead Electric provides electrical service in the City of Libby and in the surrounding area. The service area includes all of the Flathead Valley and Libby along with several hundred members along the Montana border.



The Yaak area and the development around Bull Lake are served by Northern Lights, also a cooperative. Northern Lights, Inc., based in Sagle, Idaho, is a member-owned rural electric cooperative serving northern Idaho, western Montana and northeast Washington. The town of Troy has its own electrical distribution system. All electrical utilities are dependent on the Bonneville Power Administration for their wholesale electric needs.

### **3.4.3 Transportation**

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Transportation in Lincoln County is dependent on the major highways which include: U.S. Highway 2 which runs from the Flathead County line to the Montana/Idaho border and bisects the communities of Libby and Troy; Highway 37 which crosses the Kootenai River and follows it north to Eureka; and, U.S. Highway 93 which runs south from the U.S./Canadian border at the Port of Roosville to Flathead County and bisects the communities of Eureka, Fortine, and Trego.

Lincoln County has three roads districts which are District #1 Libby; District #2 Troy; District #3 Eureka. The Libby District maintains 186 miles of county roads and 25 miles of gravel Forest Service Schedule A roads. They also maintain 19 bridges. The Troy District maintains 127.9 miles of paved county roads, 11 miles of gravel roads and 12 bridges (6 two-lane and 6 one-lane). Troy District road crews also plows 52 miles of Forest Service Schedule A roads and 30 miles of the Yaak River Road (MT 508). The Eureka District maintains approximately 300 miles of chip-sealed roads and 10 miles of gravel roads.

Lincoln County has airports in Troy, Eureka and Libby. The Troy airport is owned by the Forest Service. Some maintenance is shared with the Lincoln County Airport Board. The Eureka airport is approximately 5 miles north of Eureka. It has a paved runway 75 feet by 4,250 feet capable of handling jet aircraft. The Libby Airport is south of Libby on the Farm to Market Road. The runway is 5,000 feet long at an elevation of 2,601 feet. This airport is very busy during the fire season as the Forest Service has a heliport adjacent to the field. Heliports used for firefighting also are located in the Crystal Lakes subdivision west of Fortine, at the DNRC facility in Libby, and at the Upper Ford, Sylvanite, and Murphy Lake USFS Work Centers.

Rail service in Lincoln County is provided by Burlington-Northern Santa Fe (BNSF) railroad and Amtrak. The BNSF rail line provides commercial and industrial transportation and is an important commercial carrier in south Lincoln County. If the Montmore Mine begins production, the ore will be transported by rail. Recently the rail spur that served the Tobacco Valley was purchased from BNSF by a private company (Mission Mountain Railroad). Rail usage is still mostly based on lumber products.

Amtrak's Empire Builder passenger train departs daily from the Libby Station traveling to the west coast in the evening and the east coast in the morning. The average capacity of the train is estimated to be 400 passengers. The Lincoln County Growth Policy states that approximately 4,000 people utilize this service per year. Amtrak is subsidized by the federal government and comes up frequently for renewal.

The Flathead Tunnel is a critical facility associated with the BNSF railway system, approximately 28 miles west of Whitefish, in Lincoln County. It is a 7.01 railroad tunnel, the second-longest tunnel in the U.S. Speed. About 50 freight trains travel through it every day, in addition to the Empire Builder. Speed through the tunnel is 50 mph. The tunnel was finished in 1970 and because of its extreme



length, a special ventilation system had to be installed. The ventilation system is used to clear locomotive exhaust between each train, which can currently take between 10 and 20 minutes before its safe for employees and passengers. If there's a power outage in the area, it can take much longer. To combat this issue, BNSF is installing a 2,000-kilowatt backup generator at the tunnel that will help prevent delays. <https://www.onlyinyourstate.com/montana/flathead-tunnel-in-mt/>

### 3.4.4 Law Enforcement and Emergency Services

The Lincoln County Sheriff's Department is located in Libby and is responsible for law enforcement services throughout the county. The county detention center is also located in Libby.

#### Fire Services

The Libby Volunteer Fire Department/Libby Rural Fire District (combined services) provides structure protection within a 15-mile radius around the City of Libby. Fire protection in the unincorporated area is provided by nine rural fire departments/service areas, including: Libby Rural Fire Department; Bull Lake Rural Fire District; Eureka Fire Service Area; Fisher River Valley Fire/Rescue Battalions 1 & 2 Libby Rural Fire District; McCormick Rural Fire District; Trego, Fortine, Stryker Fire Service Area; Troy Rural Fire District; Yaak Fire Service Area; Cabinet View Fire Service Area; and, West Kootenai Fire Protection Company. All fire districts in the county are part of a mutual aid agreement and will respond to calls for assistance from other districts.

#### Disaster and Emergency Services

The Lincoln County Emergency Management Agency is the lead agency for disaster related services and coordination. The EMA Director serves as the County Fire Warden and Chair of the County Fire Co-op. The Fire Co-op is comprised of all of the volunteer fire departments as well as State and Federal agencies with firefighting responsibility. EMA represents the county for disaster related incident command functions, emergency operations planning, preparedness grant funding activities, serves as Chair of the LEPC and maintains status of FCC 2-way radio communications licensing and use authority for licenses held by the county. Lincoln County utilizes volunteers to meet many of its emergency service needs.

## 3.5 Population Trends

Lincoln County is the 10<sup>th</sup> most populous in Montana with a population of 19,440 according to 2017 U.S. Census estimates. The population of Lincoln County grew dramatically from 1950 to 1970. After two decades of slight population losses from 1970 to 1990, the population in the county was once again growing with a 7.2 percent increase from 1990 to 2000 and a 4.3 percent increase from 2000 to 2010. Since the 2010 census, the population of Lincoln County has decreased by 247 individuals, or -1.25 percent. **Table 3.5-1** illustrates the change in population in Lincoln County compared to the United States and State of Montana.

Table 3.5-1. County, State and National Population Trends

Year	Lincoln Co. Population	% change from previous census	State of Montana Population	% change from previous census	United States Population	% change from previous census
2017 est.	19,440	-1.25%	1,050,493	6.17%	325,719,178	5.50%
2010	19,687	4.3%	989,415	9.67%	308,745,538	9.71%
2000	18,837	7.2%	902,190	12.91%	281,424,602	13.15%
1990	17,481	-1.5%	799,065	1.57%	248,709,873	9.79%
1980	17,752	-1.7%	786,690	13.29%	226,542,199	11.43%
1970	18,063	30.6%	694,409	2.91%	203,302,031	13.37%



## Section 3: Community Profile

Year	Lincoln Co. Population	% change from previous census	State of Montana Population	% change from previous census	United States Population	% change from previous census
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Source: U.S. Census Bureau, 2018

**Table 3.5-2** presents population statistics for the incorporated communities and the Census Designated Places (CDP) within Lincoln County. Census estimates from 2016/17 show that while population in the City of Libby and Town of Eureka and Rexford have increased since 2010, the City of Troy has decreased in increased in population. Census designated areas which have increased in population since the 2010 census include Indian Springs, Midvale, Stryker, Trego, and White Haven while CDPs which have lost population include Fortine, Happy Inn, Pioneer Junction, Sylvanite, West Kootenai, and Yaak.

**Table 3.5-2. Lincoln County Community Population Trends**

Incorporated Community /CDP	1980	% Change Since Last Census	1990	% Change Since Last Census	2000	% Change Since Last Census	2010	% Change Since Last Census	2016/7 Est.	% Change Since Last Census
Eureka (Town)	1,119	-6.8%	1,043	-7.3%	1,017	-2.6%	1,037	1.9%	1,100	6.08%
Fortine CDP	--	--	--	--	169	--	325	48%	306	-5.85%
Happy Inn CDP	--	--	--	--	--	--	164	--	86	-47.56%
Indian Springs CDP	--	--	--	--	--	--	31	--	41	32.26%
Libby (City)	2,748	19.6%	2,532	-8.5%	2,626	3.6%	2,628	0.1%	2,691	2.40%
Midvale CDP	--	--	--	--	--	--	393	--	440	11.96%
Pioneer Junction CDP	--	--	--	--	--	--	959	--	864	-9.91%
Rexford (Town)	130	-87%	132	1.5%	151	12.6%	105	-43.8%	153	45.71%
Stryker CDP	--	--	--	--	--	--	26	--	32	23.08%
Sylvanite CDP	--	--	--	--	--	--	103	--	102	-0.97%
Trego CDP	--	--	--	--	--	--	541	--	624	15.34%
Troy (City)	1,088	3.9%	953	14.2%	957	0.4%	938	-2.0%	904	-3.62%
West Kootenai CDP	--	--	--	--	--	--	365	--	220	-39.73%
White Haven CDP	--	--	--	--	--	--	577	--	630	9.19%
Yaak CDP	--	--	--	--	--	--	248	--	242	-2.42%

Notes: CDP = Census Designated Place; -- = data not available; Source: U.S. Census Bureau, 2018

A number of factors contribute to the population growth patterns in Lincoln County. During the period from 1950 to 1960, the high birth rates of the baby boom along with increased employment in the manufacturing sector contributed to population growth in the county. Building of the Libby Dam during the 1960's brought construction jobs and increased population during this decade. From 1970 to 1990, birth rates declined and with the completion of the Libby Dam, construction jobs fell from 1,611 in 1970 to 420 in 1980. Although the manufacturing base (primarily the wood products industry) began to decline throughout the 1990's, the population grew due to an increase in the service industries and in-migration related to the natural amenities in the county.

### 3.6 Housing Stock

The U.S. Census estimates that in 2016, Lincoln County (outside the cities and towns) had 11,484 housing units. The median value of the occupied housing units was \$173,900. A further breakdown of the housing units from the census is presented in **Table 3.6-1**.



Table 3.6-1. U.S. Census Housing Data – 2016 Estimates; Lincoln County

Category	Lincoln County	Libby (City)	Troy (City)	Eureka (Town)	Rexford (Town)
Total Number of Housing Units	11,484	1,446	436	651	71
Median Value Housing Units	\$173,900	\$95,400	\$139,100	\$126,600	\$259,200
Year Structure Built					
2014 or later	86	0	0	0	0
2010 to 2013	212	0	0	5	0
2000 to 2009	1,686	68	23	44	7
1990 to 1999	1,961	76	41	75	10
1980 to 1989	1,619	72	70	56	13
1970 to 1979	2,157	250	106	40	30
1960 to 1969	1,109	115	16	106	0
1950 to 1959	1,074	248	44	123	0
1940 to 1949	527	203	28	60	2
1939 or earlier	1,053	414	108	142	9

Source: U.S. Census, 2018 (American Community Survey 2012 – 2016). Notes: “-”= data not available.

In 2016, traditional single-family units were the predominant type of housing in the county, comprising 73.8 percent of all housing units. Mobile homes made up 18.8 percent of housing stock while duplexes and multi-family units comprised 5.9 percent of all units in the county. Most of multi-family units (65%) were in Libby while the majority of mobile homes (89%) were in the unincorporated areas. The number of mobile homes increased from 1,941 in 1990 to 2,161 in 2016.

### 3.7 Economy

Historically the Lincoln County economy was dominated by the lumber industry, and to a lesser extent the mining industry. Currently, no mines and no mills are operating, and federal and local government are now the largest employers in the county. Historic asbestos mining and processing at the W.R. Grace mine near Libby has resulted in a number of community-wide asbestos-related health issues. The current superfund listing, and cleanup has had a significant effect on the community, in terms of public health and the local economy. With over 8,000 properties investigated and over 2,600 cleanups completed, the EPA has determined that cleanup of asbestos-contaminated properties is nearly complete. Future economic growth in Libby is likely to come from the finance, education, government and service sectors of the economy. According to the Montana Department of Labor, the unemployment rate in Lincoln County was 8.9 percent in April 2018.

Mines’ Management, Inc., an Idaho corporation has submitted plans for a copper and silver mine referred to as the Montanore Project. The underground mine would be in Sanders County, and the mill and other facilities would be in Lincoln County. This mine could have a significant growth impact on Lincoln County in the next decade.

Multiple efforts are underway to increase the tourism-based income in Lincoln County. Lincoln County is one of Montana’s hidden treasures with the potential to be a tourist destination stop. The natural beauty, abundance of wildlife, freedom to use the National Forest (hiking, fishing, scenic driving, hunting camping), a rich history, Lake Koocanusa, Ten Lakes Scenic Area, Kootenai Falls, Cabinet Mountain Wilderness etc. and the friendliness of the people are just a few of the county’s many attractions that will enhance tourism development.



The per capita personal income in Lincoln County is \$22,404 compared to \$27,309 for the State of Montana. U.S. Census Bureau estimates indicate that 17.9 percent of the county population is living below the poverty level compared to 13.3 percent for the State of Montana. With the exception of Rexford, incorporated communities in Lincoln County are also below State poverty. **Table 3.7-1** presents economic indicators for Lincoln County and the incorporated communities in 2016.

**Table 3.7-1. Lincoln County 2016 Economic Indicators**

Indicator	State of Montana	Lincoln County	Libby (City)	Troy (City)	Eureka (Town)	Rexford (Town)
Per capita income (2012-2016)	\$27,309	\$22,404	\$21,155	\$19,453	\$18,716	\$16,087
Median household income (2012-2016)	\$48,380	\$35,461	\$24,271	\$25,640	\$26,223	\$30,750
Persons living below poverty level	13.3%	17.9%	20.3%	27.2%	34.5%	8.4%

Source: U.S. Census, 2018 (American Community Survey 2012 – 2016).

### 3.8 Land Use and Future Development

Lincoln County is predominantly a rural county. Rural development generally occurs in the five river valleys (Tobacco Valley, Lake Creek, Yaak River, Fisher River and Libby Valley). Approximately 92 percent of the land is covered by forestland. According to the Lincoln County Growth Policy, the most significant effect on Lincoln County land use will be the result of forest industry companies disposing of or developing their land by creating residential or recreational subdivisions.

In 2003, Stimson Lumber Company donated their former 400-acre mill site to the Lincoln County Port Authority. This site has now been developed into the Kootenai Business Park and is presently an active industrial site with potential to develop additional light manufacturing and industrial jobs. The Tobacco Valley also has a new Business Park that has the potential to be a cornerstone of economic vibrancy in the Tobacco Valley.

South of the Tobacco Valley are the small communities of Trego, Fortine, and Stryker. This area has experienced significant residential growth. The Highway 93 corridor through this stretch contains some scattered commercial and industrial uses. These uses are more dispersed than in the corridor north of Eureka. The largest industrial use is the Ksanka Mill, which is the only operating mill left in this part of Lincoln County. Fortine is located 11 miles south of Eureka and 39 miles north of Whitefish. New growth has not occurred in the town site, but in large lot rural areas to the west and north.

As the population of Lincoln County and the region increases, the demand for land for residential homeland, commercial sites, industrial facilities, roads, and supporting infrastructure increases. The demand for these necessities requires thoughtful consideration of how these necessities will impact adjacent land uses and other non-related issues such as air quality, school facilities, emergency services, traffic safety, water quality and availability. Building residences, businesses, water and sewer systems and roads out of hazard prone areas is the central issue that links all the other issues together. Approximately 8 percent of the City of Libby is within the 100-year floodplain.

#### 3.8.1 Land Use Implementation Tools

Industrial, commercial and residential land use is managed with zoning and subdivision regulations in accordance with guidelines set forth in the county and city growth policies. These documents



recognize natural hazards require regulations to ensure safe growth. Building codes also play an important role to ensure structures are built to minimum safety standards.

### **Growth Policies**

Lincoln County adopted a Growth Policy in 2009 to help address growth pressures. This document is currently being updated. A growth policy was also completed to guide land use decisions in the Cities of Libby (2010) and Troy (2008). The towns of Eureka and Rexford do not have a growth policy at this time. In 2010, a Neighborhood Plan was developed for the Thompson Chain-of-Lakes area.

The Lincoln County Growth Policy outlines a number of goals and objectives that support hazard mitigation, as summarized below.

Land Use Goal 1: Complete a Land Use Inventory and Analysis of the existing land uses with the county to identify the constraints and opportunities facing future development.

2. Objective: Analyze the information gathered during the inventory to identify constraints and opportunities for future development (i.e. document natural hazards, environmental constraints, transportation networks, natural amenities, et. al.)
3. Objective: Gather and consolidate information through the inventory and analysis process to serve as an educational tool and as a guide for choosing the appropriate methods for implementing the Growth Policy.

Land Use Goal 5: Provide flexibility within development regulations.

4. Objective: Support efforts to strengthen Wildland Urban Interface (WUI) regulations for new subdivisions.
5. Objective: Ensure that vegetation management for new subdivisions in the WUI are completed prior to filing the final plat and those provisions for future maintenance of vegetation is addressed.
6. Objective: Identify design standards and regulations that could mitigate the potential impacts of incompatible uses upon one another.

The City of Libby's Growth Policy identifies a natural resource policy statement related to hazard mitigation, as follows: "The city seeks to have a healthy community with clean air, clean water and sustainable use of its natural resources while respecting the constraints of such resources". Goals and action items designed to achieve the policy are listed below.

Goal: Reduce Risks of Catastrophic Fires.

7. Support active forest management in the Libby municipal watershed of Flower Creek.
8. Review the floodplain ordinance and work with the Lincoln County Floodplain Administrator on desired changes.
9. Adopt regulations addressing development activities that may adversely impact slope stability or increase erosion potential.



The City of Troy's Growth Policy acknowledges that the topography and geography of the Troy area presents certain development constraints due to hydric soils, steep slopes, floodplain and other soil limitations. The following issue pertaining to wildfire was identified: "Residential development expanding into timbered lands will increase the risk of wildfire in the new urban interface". Goals, policies and/or action items relating to wildfire mitigation were not identified in the growth policy. Flood mitigation is addressed by the following goal, policy and recommendations:

Goal: Protect wetland and riparian areas since they are important in flood prevention, maintaining water quality and providing habitat.

10. Diversion, channelization and dikes along natural rivers and streams should be avoided. Filling of wetlands and the 100-year floodplain should be avoided.
11. The city should coordinate with the county in developing a community-wide drainage plan encompassing the city and surround suburbs to reduce water pollution and flooding.
12. Maintain the integrity of environmentally sensitive areas in order to prevent flooding (maintain high water quality and prevent soil erosion).

### Zoning Regulations

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Development within the City of Libby and Town of Rexford is subject to municipal zoning regulations. The City of Troy is in the process of adopting zoning regulations. There is no municipal zoning in Eureka. Development restrictions that are administered at the county level consist of subdivision regulations, floodplain regulations (with the exception of Rexford), lakeshore construction regulations, and airport zoning regulations. Details from these regulations, as appropriate, are presented in the hazard profiles in *Section 4*.

### Subdivision Regulations

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Lincoln County updated subdivision regulations in 2015 that apply to unincorporated areas within the county. The City of Libby updated their subdivision regulations in 2011. These regulations control the division of land, platting of lots, dedication of new roads, and the provision of infrastructure improvements. The City of Troy and Town of Eureka do not have their own subdivision regulations.

Land that the Lincoln County Commissioners determine is unsuitable for subdivision because of natural or human caused hazards may not be subdivided for building or residential purposes unless the hazards are eliminated or will be overcome by approved design and construction techniques. The subdivision regulations also address fire protection measures and require ingress/egress on roads for fire suppression equipment and also an adequate water supply. Details from these regulations are presented in the hazard profiles in *Section 4*.

### Building Codes

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Building codes are also a tool to control future development. The main purpose of building codes are to protect public health, safety and general welfare as they relate to the construction and occupancy of buildings and structures. They comprise a set of rules that specify the minimum acceptable level of safety for buildings and often contain requirements for roof construction associated with snow and wind loads. Building codes are generally intended to be applied by architects and engineers, but are also used by building inspectors. Lincoln County does not have a building department and as





such, does not enforce building codes. The State of Montana does building inspections in Lincoln County for commercial construction and residential four-plex units or larger. The cities of Libby and Troy are certified to enforce building codes. The towns of Eureka and Rexford all under the State's jurisdiction.

### **Floodplain Regulations**

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Recurrent flooding of land resources causes loss of life, damage to property, disruption of commerce and governmental services, and unsanitary conditions. These are all detrimental to the health, safety, welfare, and property of the occupants of flooded lands. It is in the public interest to manage regulation of flood prone lands and waters in a manner consistent with sound land and water use management practices which will prevent and alleviate flooding threats to life and health and reduce private and public economic losses.

Lincoln County, the Cities of Libby and Troy, and the Town of Eureka all participate in the National Flood Insurance Program (NFIP). In return for the local adoption and enforcement of floodplain management regulations that meet the minimum criteria of the NFIP, FEMA provides the availability of flood insurance coverage within Lincoln County. The Floodplain Regulations prescribe minimum standards for development within the regulated flood hazard areas and have a high degree of impact on land use decisions.

### **3.8.2 Future Development**

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Lincoln County is predominantly a rural county. Urban development is concentrated in the incorporated areas of Libby, Troy, Eureka, and Rexford. The City of Libby is the largest area and most densely developed. The incorporated area accounts for less than five square miles of land. The largest unincorporated area is south Libby. This area extends from Libby four miles south along Highway 2. According to the Lincoln County Growth Policy, the incorporated communities are generally prime areas for expansion since the cost of services would be most efficient. Some communities have one or more natural limitations or infrastructure that limit potential future expansion such as: narrow valleys, water bodies, steep slopes, and highways. Other factors that currently limit the growth of the population centers are the lack of public water and sewer capacity and the need for infrastructure improvements.

According to the Lincoln County Growth Policy, much of the economic growth in the county will likely come from the expansion of existing businesses as opposed to the attraction of new ones. Lincoln County is a natural resource rich county but is a distance from major markets. Mines Management, Inc., an Idaho corporation, has submitted plans for a copper and silver mine (the Montanore Project). The underground mine would be in Sanders County, and the mill and facilities would be in Lincoln County.

Weyerhaeuser Company absorbed Plum Creek Timber Company lands in a merger in 2016 and owns over 10 percent of the land in Lincoln County. The Company is responding to higher land values and the demand for rural recreational and residential properties by increasing land sales of forest tracts and residential developments within Lincoln County and the state. As such, the substantial sell-off of timber lands, including inholdings near Forest Service lands, has greatly increased the WUI in Lincoln County.



### *Section 3: Community Profile*

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There is strong interest in establishing impact or mitigation fees to provide sustainable funding and in tracking new construction through building site permits. It is felt growth must pay for growth.

*Section 4.10* presents a hazard analysis of the proposed future development projects in Lincoln County.



## SECTION 4. RISK ASSESSMENT AND VULNERABILITY ANALYSIS

Lincoln County is exposed to many hazards both natural and man-made. A risk assessment and vulnerability analysis was completed to help identify where mitigation measures could reduce loss of life or damage to property in the county, cities of Libby and Troy, and towns of Eureka and Rexford.

This section includes a description of the risk assessment methodology and a hazard profile for eight hazards organized from high to low by county priority: wildfire, hazardous material incidents & transportation accidents, flooding, disease, active shooter/workplace violence, severe weather, terrorism, civil unrest & cyber security, and dam failure. The section is concluded with a risk assessment summary and discussion on the location of future development projects. Supporting documentation is presented in **Appendix C**.

### 4.1 Risk Assessment Methodology

A risk assessment was conducted to address requirements of the DMA 2000 for evaluating the risk to Lincoln County from natural and man-made hazards. DMA 2000 requires measuring potential losses to critical facilities and property resulting from natural hazards by assessing the vulnerability of these facilities to natural hazards. In addition to the requirements of DMA 2000, the risk assessment approach taken in this study evaluated risks to vulnerable populations and also examined the risk presented by several man-made hazards. The goal of the risk assessment process is to determine which hazards present the greatest risk and what areas are the most vulnerable to hazards.

The risk assessment approach used for this plan entailed using GIS software and data to develop vulnerability models for people, structures and critical facilities, and evaluating those vulnerabilities in relation to mapped hazard locations. This type of approach to risk assessment is dependent on the detail and accuracy of the data used during the analysis. Additionally, some types of hazards are extremely difficult to model. Data limitations are described in *Section 4.1.7*.

#### 4.1.1 Critical Facilities and Building Stock

Critical facilities were mapped using coordinates provided by Lincoln County. Mapping of these facilities allowed for the comparison of their location to the hazard areas where such hazards are spatially recognized. Construction type of critical facilities (e.g. steel, wood, masonry, etc.) has not been compiled and was therefore, not considered in the analysis. This data should be collected for future updates of this plan.

Infrastructure, including bridges, water and wastewater facilities, and communication sites had digital mapping available and were therefore included in the analysis. Critical facility values were obtained, where readily available, from municipal departments and insurance companies. Replacement values for privately-owned critical facilities were used in the risk assessment where this information was readily available from the Montana Department of Revenue's (MDOR) Cadastral



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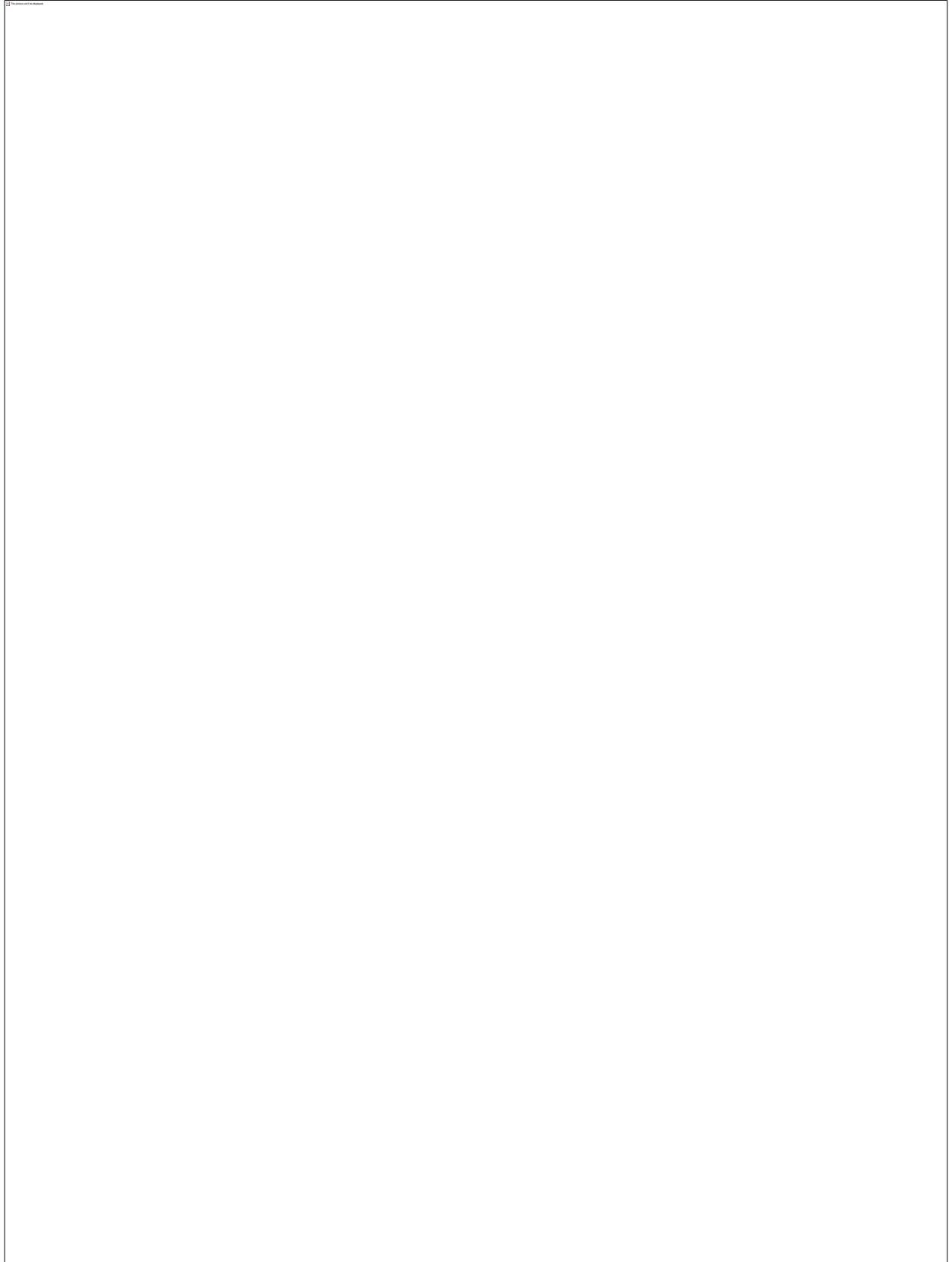
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Mapping Program. **Figures 3, 3A, 3B and 3C** present the location of critical facilities in Lincoln County, Libby, Troy and Eureka, respectively.



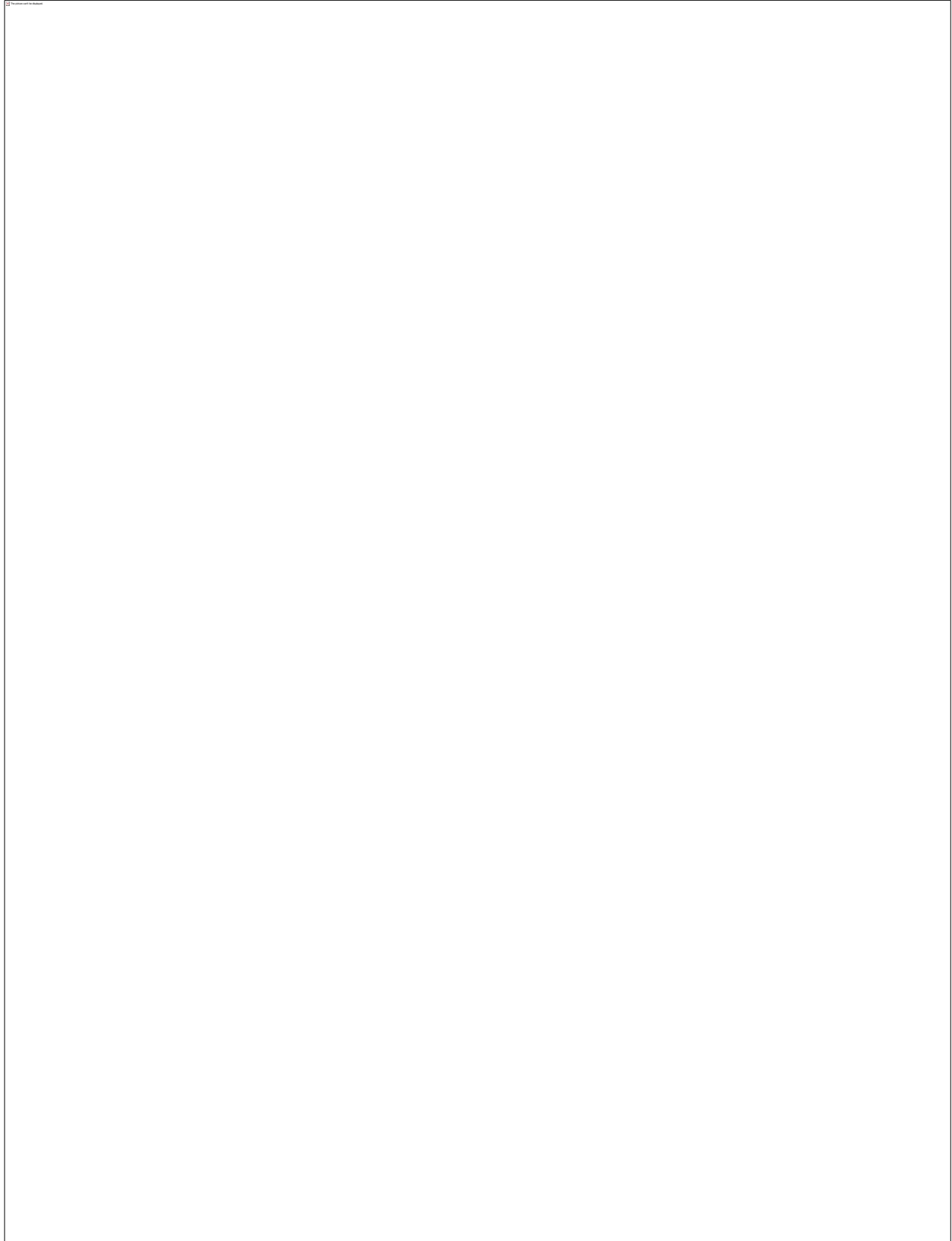
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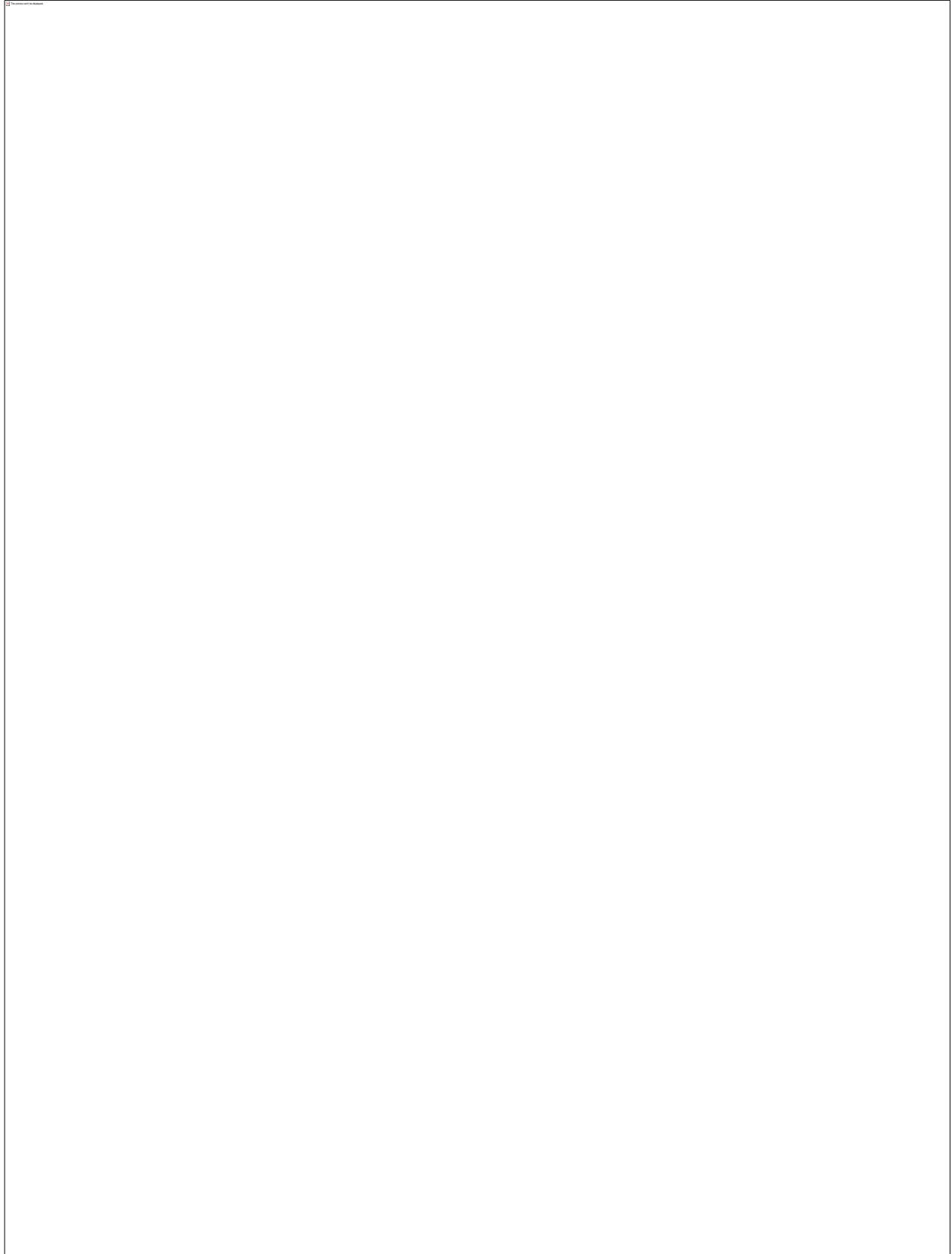
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Bridge data was obtained from the Montana State Library, Natural Resource Information System (NRIS) and the National Bridge Inventory. Bridge replacement values were extrapolated using unit costs for span length and width. **Figure 4** presents the bridge locations in Lincoln County. **Appendix C-2** presents a key to the bridge inventory. Lincoln County may wish to enhance the bridge data for the 2023 MHMP update by adding the major culverts in the county.

Building stock data was downloaded from the Montana State Library, NRIS Structure Framework dataset. This dataset consists of a routinely updated database of primary structures/buildings and addresses across the state of Montana. For the hazard risk analysis, important information within this dataset includes structure type and parcel number. Structure type indicates building function, e.g., agricultural, residential, commercial, churches, schools, etc. The four structure types retained for the hazard analysis included residential, and commercial, industrial, and agricultural. The dataset provides spatial locations of structures within each parcel.

The NRIS Structures Framework dataset does not contain building values, an important factor in the MHMP vulnerability analysis. However, the dataset does contain parcel numbers which were related to the MDOR Cadastral Mapping Program dataset which contains both parcel numbers and building values. Building exposure in the risk assessment is presented for Lincoln County, Libby, Troy, and Eureka.

### 4.1.2 Vulnerable Population

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Using the number of residential structures in each hazard impact area, vulnerable population was estimated by assigning 2017 U.S. Census county estimates on number of persons residing in each structure, percent of population over age 65 years, and under age 18. The number of residential buildings within a hazard impact area was multiplied by its respective county average number of people residing in a household in Montana (U.S. Census Quick Facts July 1, 2017). Exceptions include structures typed as “Multi-Family” residential dwellings and “Nursing Home”. Multi-Family structures (e.g., apartment buildings) were estimated at 18 people and nursing homes were estimated at 40 people. Census data also provided county percentages for persons under 18 years and persons 65 years and over. These percentages were multiplied by the total population number within a hazard area to calculate people at risk under 18 and age 65 years or more.

### 4.1.3 Hazard Identification

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The 2011 Lincoln County PDM Plan (Tetra Tech, 2011) identified 10 hazards including: wildfire, structure fire, flooding, dam failure, hazardous material incidents, railroad accidents, severe winter weather, severe summer weather, landslides, and earthquake. These hazards were reviewed for the 2018 MHMP by the Planning Team who considered what other hazards might be of consequence since development of the 2011 PDM Plan.

Hazards profiled in the 2018 MHMP update include those from the 2011 PDM Plan with the following changes: summer weather and winter weather are combined into one hazard profile, hazardous material incidents and railroad accidents are combined into one hazard profile with the profile expanded to include all transportation-related accidents. Two new hazards are profiled for the 2018



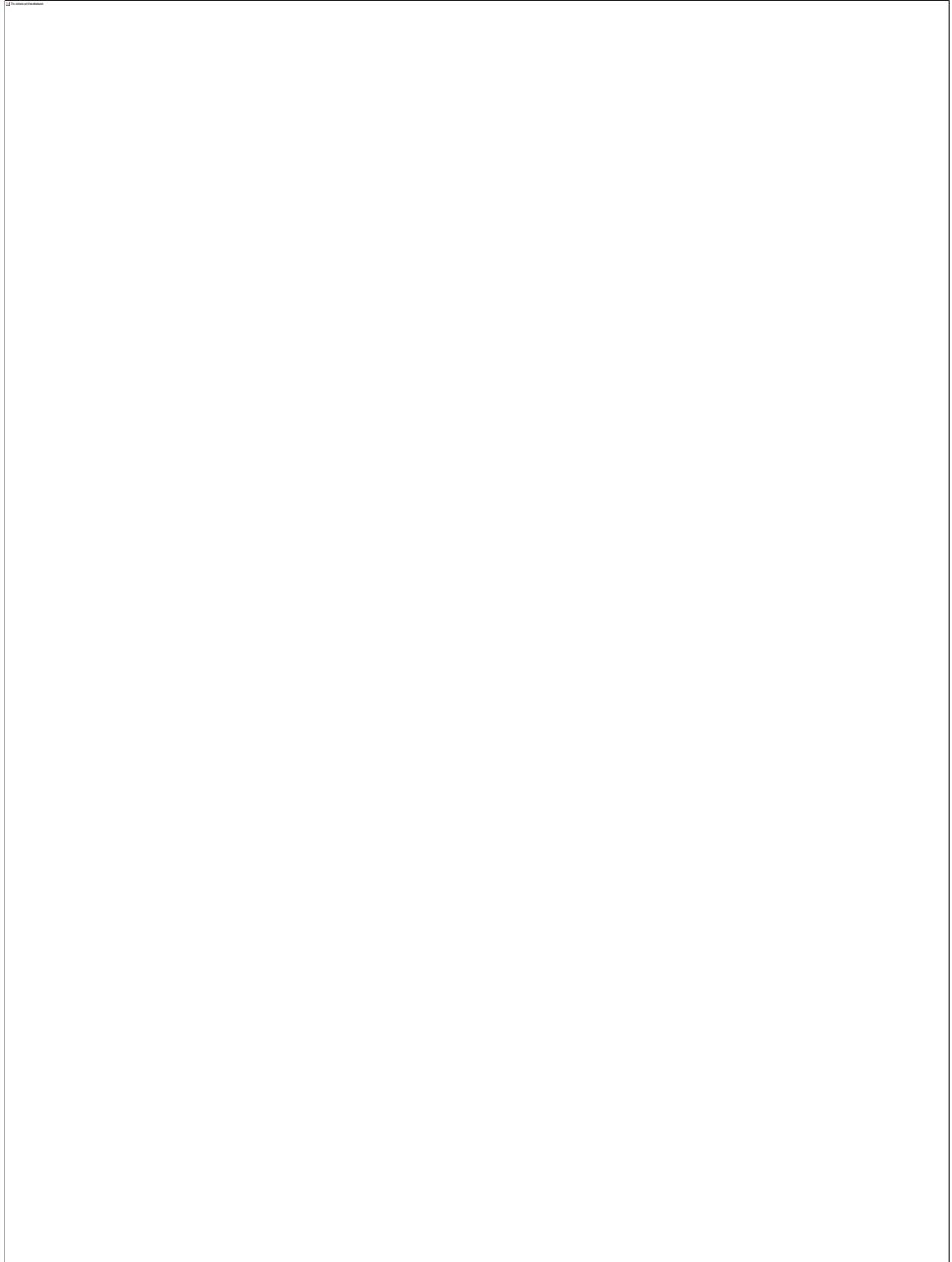
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MHMP: active shooter/workplace violence and terrorism/civil unrest/cyber security. The Planning Team decided that the structure fire, earthquake and landslide hazards should be de-emphasized in



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the 2018 MHMP because they either occur locally or don't occur with a frequency and/or magnitude to damage property or impact public safety.

### 4.1.4 Hazard Profiles

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Hazard profiles were prepared for each of the identified hazards and are presented within this section according to their prioritized rank (see *Section 4.1.6*). The level of detail for each hazard is generally limited by the amount of data available.

Each hazard profile contains a description of the hazard and the history of occurrence, the vulnerability and area of impact, probability and magnitude, an evaluation of how future development is being managed to reduce risk, and how climate change may impact hazard probability and magnitude in the future. The methodology used to analyze each of these topics is further described below.

#### Description and History

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A number of databases were used to describe and compile the history of hazard events profiled in this plan. This data was supplemented by input from the public, local officials, newspaper accounts, and internet research. The two primary databases used included the National Climatic Data Center (NCDC) Storm Events Database and Spatial Hazard Events and Losses Database for the United States (SHELDUS).

The NCDC Storm Events database receives Storm Data from the National Weather Service. The NWS receives their information from a variety of sources, including county, state and federal emergency management officials, local law enforcement officials, skywarn spotters, NWS damage surveys, newspaper clipping services, the insurance industry, and the general public. Storm Data is an official publication of the National Oceanic and Atmospheric Administration (NOAA) which documents the occurrence of storms and other significant weather phenomena having sufficient intensity to cause loss of life, injuries, significant property damage, and/or disruption to commerce.

SHELDUS is a county-level hazard data set for the United States for 18 different natural hazard event types. For each event, the database includes the date, location, property losses, crop losses, injuries, and fatalities that affected each county. The database includes every loss-causing and/or deadly event between 1960 through 1975 and from 1995 onward. Between 1976 and 1995, SHELDUS reflects only events that caused at least one fatality or more than \$50,000 in property or crop damages. In order to compensate for the under-reporting of losses in general and to provide more loss-info for rural counties, SHELDUS now reports U.S. Department of Agriculture (USDA) data, which breaks down losses by floods, droughts, etc. just like the traditional SHELDUS data. However, the USDA data are all insured losses, i.e. disaster crop insurance payments (indemnity payments).

#### Vulnerability and Area of Impact

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Vulnerabilities are described in terms of critical facilities, structures, population, and socioeconomic values that can be affected by the hazard event. Hazard impact areas describe the geographic extent to which a hazard can impact a jurisdiction and are uniquely defined on a hazard-by-hazard basis. Mapping of the hazards, where spatial differences exist, allows for hazard analysis by geographic



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location. Some hazards can have varying levels of risk based on location. Other hazards cover larger geographic areas and affect the area uniformly.

### Probability and Magnitude

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Probability of a hazard event occurring in the future was assessed based on hazard frequency over a 100-year period. Hazard frequency was based on the number of times the hazard event occurred divided by the period of record. If the hazard lacked a definitive historical record, the probability was assessed qualitatively based on regional history and other contributing factors. Probability was broken down as follows:

1. Highly Likely – greater than 1 event per year (frequency greater than 1).
2. Likely – less than 1 event per year but greater than 1 event every 10 years (frequency greater than 0.1 but less than 1).
3. Possible – less than 1 event every 10 years but greater than 1 event every 100 years (frequency greater than 0.01 but less than 0.1).
4. Unlikely – less than 1 event every 100 years (frequency less than 0.01)

The magnitude or severity of potential hazard events was evaluated for each hazard. Magnitude is a measure of the strength of a hazard event and is usually determined using technical measures specific to the hazard. Magnitude was calculated for each hazard where property damage data was available. Magnitude is expressed as a percentage according to the following formula:

5.  $(\text{Property Damage} / \text{Number of Incidents}) / \$ \text{ of Building Stock Exposure}$

### Future Development

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The impact to future development was assessed based on potential opportunities to limit or regulate development in hazardous areas such as zoning and subdivision regulations. The impacts were assessed through a narrative on how future development could be impacted by the hazard. Plans, ordinances and/or codes currently in place were identified that could be revised to better protect future development in Lincoln County from damage caused by natural and man-made hazards.

### Climate Change

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An essential aspect of hazard mitigation is predicting the likelihood of hazard events in a planning area. Typically, predictions are based on statistical projections from records of past events. This approach assumes that the likelihood of hazard events remains essentially unchanged over time. Thus, averages based on the past frequencies of, for example, floods are used to estimate future frequencies: if a river has flooded an average of once every 5 years for the past 100 years, then it can be expected to continue to flood an average of once every 5 years.

For hazards that are affected by climate conditions, the assumption that future behavior will be equivalent to past behavior is not valid if climate conditions are changing. As flooding is generally associated with precipitation frequency and quantity, for example, the frequency of flooding will not remain constant if broad precipitation patterns change over time. Specifically, as hydrology changes, storms currently considered to be a 1 percent annual chance event (100-year flood) might strike more often, leaving many communities at greater risk. The risks of landslide, severe storms, extreme heat and wildfire are all affected by climate patterns as well. For this reason, an understanding of climate change is pertinent to efforts to mitigate natural hazards. Information about how climate



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patterns are changing provides insight on the reliability of future hazard projections used in mitigation analysis.

At the end of each hazard profile in this section is a discussion on climate change. The information provides insight on how the hazard may be impacted by climate change and how these impacts may alter current exposure and vulnerability for the people, property, and critical facilities.

### **4.1.5 Hazard Ranking and Priorities**

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In ranking the hazards, the Planning Team completed a Calculated Priority Risk Index (CPRI) Work Sheet. The CPRI examines five criteria for each hazard (probability, magnitude/severity, economic impact, warning time, and duration); the risk index for each, according to four levels, then applies a weighting factor (**Table 4.1-1**). The result is a score that has been used to rank the hazards. Each hazard profile presents its CPRI score with a cumulative score sheet included in **Appendix C. Table 4.1-2** presents the results of the CPRI scoring for all hazards.



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**Table 4.1-1. Calculated Priority Risk Index**

CPRI Category	Degree of Risk			Assigned Weighting Factor
	Level ID	Description	Index Value	
<b>Probability</b>	Unlikely	Rare with no documented history of occurrences of events. Annual probability of less than 0.01.	1	30%
	Possible	Infrequent occurrences with at least one documented or anecdotal historic event. Annual probability that is between 0.1 and 0.01	2	
	Likely	Frequent occurrences with at least two or more documented historic events Annual probability that is between 1 and 0.1	3	
	Highly Likely	Common events with a well-documented history of occurrence. Annual probability that is greater than 1	4	
<b>Magnitude/ Severity</b>	Negligible	Negligible property damages (less than 5% of critical and non-critical facilities and infrastructure). Injuries or illnesses are treatable with first aid and there are no deaths. Negligible quality of life lost.	1	25%
		Shut down of critical facilities for less than 24 hours.		
	Limited	Slight property damages (greater than 5% and less than 25% of critical and non-critical facilities and infrastructure). Injuries or illnesses do not result in permanent disability and there are no deaths. Moderate quality of life lost Shut down of critical facilities for more than 1 day and less than 1 week.	2	
		Moderate property damages (greater than 25% and less than 50% of critical and non-critical facilities and infrastructure). Injuries or illnesses result in permanent disability and at least one death. Shut down of critical facilities for more than 1 week and less than 1 month	3	
Catastrophic	Severe property damages (greater than 50% of critical and non-critical facilities an infrastructure). Injuries or illnesses result in permanent disability and multiple deaths. Shut down of critical facilities for more than 1 month.	4		
<b>Economic Impact</b>	Negligible	Little to no annual economic impact.	1	20%
	Limited	<\$1 million annual economic impact.	2	
	Critical	<\$1 billion but >\$1 million in annual economic impact.	3	
	Catastrophic	>\$1 billion annual economic impact.	4	
<b>Warning Time</b>	Less than 6 hours	Self-explanatory.	4	15%
	6 to 12 hours	Self-explanatory.	3	
	12 to 24 hours	Self-explanatory.	2	
	More than 24 hours	Self-explanatory.	1	
<b>Duration</b>	Less than 6 hours	Self-explanatory.	1	10%
	Less than 24 hours	Self-explanatory.	2	
	Less than one week	Self-explanatory.	3	
	More than one week	Self-explanatory.	4	



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**Table 4.1-2. Calculated Priority Ranking Index Summary; Lincoln County**

Hazard	Probability	Magnitude/Severity	Economic Impact	Warning Time	Duration	CPRI Score
Wildfire	Highly likely	Critical	Critical	< 6 hours	> 1 week	3.55
Hazardous Material Incidents	Highly likely	Limited	Critical	< 6 hours	< 1 week	3.2
Workplace Violence/Active Shooter	Highly likely	Critical	Limited	< 6 hours	< 24 hours	3.15
Structure Fire	Highly likely	Limited	Critical	< 6 hours	< 24 hours	3.1
Terrorism, Civil Unrest & Cyber Security	Possibly	Critical	Critical	< 6 hours	> 1 week	2.95
Disease	Highly likely	Critical	Limited	>24 hours	> 1 week	2.9
Railroad Accidents	Likely	Limited	Critical	< 6 hours	< 1 week	2.9
Flooding	Highly likely	Limited	Limited	12-24 hours	< 1 week	2.85
Highway Accidents	Highly likely	Critical	Negligible	< 6 hours	< 6 hours	2.85
Aircraft Accidents	Likely	Critical	Negligible	< 6 hours	< 24 hours	2.65
Dam Failure	Possibly	Limited	Critical	< 6 hours	< 1 week	2.6
Landslides	Likely	Limited	Limited	< 6 hours	< 6 hours	2.5
Severe Summer Weather	Highly Likely	Limited	Negligible	6-12 hours	< 6 hours	2.45
Severe Winter Weather	Likely	Limited	Limited	12-24 hours	< 1 week	2.4
Earthquake	Highly Likely	Negligible	Negligible	< 6 hours	< 6 hours	2.35
Volcanic Ash	Unlikely	Negligible	Negligible	>24 hours	< 1 week	1.2

The Calculated Priority Risk Index scoring method has a range from 0 to 4. "0" being the least hazardous and "4" being the most hazardous situation.

The Planning Team felt that the CPRI ranking did not accurately represent hazard priorities for Lincoln County. As such, the hazards were prioritized, and the top eight hazards are profiled in this Plan. **Table 4.1-3** shows the hazard priority for the 2018 MHMP compared to how hazards were ranked in 2012.

**Table 4.1-3. Prioritized Hazards for 2018 MHMP**

2018 Hazard Rank	Hazard Profile	2011 Hazard Rank / Comments	Section in 2018 Plan
#1	Wildfire	#1	Section 4.2
#2	Haz-Mat Incidents & Transportation Accidents	Hazardous Material Incidents (#5) and Railroad Accidents (#6) were profiled separately in 2011 Plan.	Section 4.3
#3	Flooding	#3	Section 4.4
#4	Disease	New hazard for 2018 MHMP	Section 4.5
#5	Workplace Violence/Active Shooter	New hazard for 2018 MHMP	Section 4.6
#6	Severe Weather	Winter Weather (#7) and Summer Weather (#8) were profiled separately in 2011 Plan.	Section 4.7
#7	Terrorism, Civil Unrest & Cyber Security	New hazard for 2018 MHMP	Section 4.8
#8	Dam Failure	#4	Section 4.9

Structure Fire (formerly #2), Landslide (formerly #9), and Earthquake (formerly #10), and were deemed lower priority hazards, for the purposes of this Plan. As such, their hazard profiles from the 2011 Lincoln County PDM Plan are included in **Appendix C-3**.





#### **4.1.6 Assessing Vulnerability – Estimating Potential Losses**

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The methodology used in the vulnerability analysis presents a quantitative assessment of the building stock, population, and critical facility exposure to the individual hazards. For hazards that are not uniform across the jurisdiction and instead occur in specific areas (e.g. wildfire, flooding, hazardous material incidents, dam failure) the hazard area factored into the loss estimation calculations. Building stock data, available from the NRIS Structures Framework and MDOR Cadastral Mapping Program was used in the analysis. Linking these two data sources enabled the location of structures within land parcels to be connected to their appraised value. When a structure had no appraised value, a county average for a home (\$91,717) or commercial property (\$156,349) was assigned. Using GIS, hazard risk areas were intersected with the building stock data to identify the number of structures and exposure due to each hazard. Hazard risk areas were also intersected with critical facility data (including infrastructure such as water and wastewater systems) to determine the number and exposure of critical facilities to each hazard. A separate analysis was completed for Lincoln County's bridges. Using the number of residential structures in each hazard area, vulnerable population was estimated by assigning U.S. Census county estimates for number of persons residing in each structure, percent of population over age 65 years, and under age 18.

For hazards that are uniform across the jurisdiction (i.e. severe weather) the methodology presented below was used to determine annualized property loss.

1. Exposure x Frequency x Magnitude

Where:

2. Exposure = building stock, vulnerable population, or critical facilities at risk
3. Frequency = annual number of events determined by calculating the number of hazard events / period of record
4. Magnitude = percent of damage expected calculated by: (property damage/# incidents)/ building stock or critical facility exposure

For hazards without documented property damage (i.e. communicable disease, terrorism), magnitude could not be calculated and therefore, only the exposure of the building stock or population was computed. Annualized loss estimates cannot be calculated without property damage using this risk assessment approach.

#### **4.1.7 Data Limitations**

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Risk assessment and vulnerability analysis results are only a general representation of the potential loss that may be experienced from a hazard event and there are many inherent inaccuracies with the methodology used. Output is only as good as the data sources used and Lincoln County may wish to consider alternate data for future MHMP updates.

The remainder of this section presents hazard profiles organized in general accordance with county priority followed by a risk assessment summary. Loss estimates, where applicable, are summarized at the end of this section.



4.2 Wildfire

CPRI score = 3.55

Description and History

A wildfire is an unplanned fire, a term which includes forest fires, grass fires, and scrub fires, both man-caused and natural in origin. Severe wildfire conditions have historically represented a threat of potential destruction within the region. Negative impacts of wildfire include loss of life, property and resource damage or destruction, severe emotional crisis, widespread economic impact, disrupted and fiscally impacted government services, and environmental degradation.

Wildfire risk is the potential for a wildfire to adversely affect things that residents value - lives, homes, or ecological functions and attributes. Wildfire risk in a particular area is a combination of the chance that a wildfire will start in or reach that area and the potential loss of human values if it does. Human activities, weather patterns, wildfire fuels, agricultural practices, values potentially threatened by fire, and the availability (or lack) of resources to suppress a fire all contribute to wildfire risk. Varied topography, a changing climate that has resulted in less precipitation and higher temperatures, and numerous human-related sources of ignition make this possible.

Major wildfires can occur at any time of year. **Table 4.2-1** presents warning and advisory criteria for wildfire and a description of prohibitions that land management agencies can put into effect to reduce fire risk and prevent wildfires during periods of high to extreme danger.

**Table 4.2-1. Warning, Advisories and Restrictions for Wildfire**

Warning/Advisory/Restriction	Description
Fire Weather Watch	1. A fire weather watch is issued when Red Flag conditions (see Red Flag Warning) are expected in the next 24 to 72 hours.
Red Flag Warning	3. A red flag warning is issued when Red Flag criteria are expected within the next 12 to 24 hours. A Red Flag event is defined as weather conditions that could sustain extensive wildfire activity and meet one or more of the following criteria in conjunction with "Very High" or "Extreme" fire danger: 1. Sustained surface winds, or frequent gusts, of 25 mph or higher; 2. Unusually hot, dry conditions (relative humidities less than 20%); 3. Dry thunderstorm activity forecast during an extremely dry period; 4. Anytime the forecaster foresees a change in weather that would result in a significant increase in fire danger. For example, very strong winds associated with a cold front even though the fire danger is below the "Very High" threshold.
Fire Warning	5. A fire warning may be issued by local officials when a spreading wildfire or structure fire threatens a populated area. Information in the warning may include a call to evacuate areas in the fire's path as recommended by officials according to state law or local ordinance.
Dense Smoke Advisory	6. Dense smoke advisories are issued when the widespread visibilities are expected at a ¼ mile or less for a few hours or more due to smoke.
Stage 1 Fire Restriction	7. No building, maintaining, attending, or using a fire, campfire, or stove fire without a permit except in Forest Service developed camp or picnic grounds. No smoking unless in an enclosed vehicle or building, a developed recreation site, or while stopped in an area at least three feet in diameter that is barren or cleared of all flammable material. No operation of welding, acetylene, or other torch with an open flame. No operation or using any internal or external combustion engine without a spark arresting device properly installed, maintained and in effective working order.



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**Table 4.2-1. Warning, Advisories and Restrictions for Wildfire**

Warning/Advisory/Restriction	Description
Stage 2 Fire Restriction	8. No building, maintaining, attending or using open fire campfires or stove fires. No smoking unless in an enclosed vehicle or building, a developed recreation site, or within a three-foot diameter cleared to mineral soil. No operation of welding, acetylene, or other torch with an open flame. No operation or using any internal or external combustion engine without a spark arresting devise properly installed, maintained and in effective working order.

Source: National Weather Service (NWS, 2018); National Interagency Fire Center, 2018 ([gacc.nifc.gov/.../r2ftc/documents/Fire\\_Restriction\\_Chart.pdf](http://gacc.nifc.gov/.../r2ftc/documents/Fire_Restriction_Chart.pdf))

Lincoln County has witnessed a number of large wildfires that have destroyed property, timber resources, scenery and impacted air quality. Between 1987 and 2018, over 120 fires greater than 100 acres burned more than 290,000 acres in the county. **Table 4.2-2** presents wildfire listings over 100 acres from the Montana DNRC and U.S. Forest Service.

**Table 4.2-2. Wildfire Listings >100 Acres in Lincoln County**

Date	Name	Cause	Acres	Date	Name	Cause	Acres
6/13/1987	Lick Creek	Warming Fire	150	9/30/1996	Rogers Mountain	Debris Burning	600
9/6/1987	Minton Peak	Other	175	9/2/1998	Dome	Lightning	3,340
2/18/1988	Bunker Hill	Smoking	102	9/3/1998	Kopsi	Lightning	1,060
8/25/1988	Dry Fork	Lightning	13,051	8/4/2000	Elk Mountain	Lightning	1,051
6/13/1987	Lick Creek	Lightning	150	8/10/2000	Taylor Peak	Lightning	1,311
7/7/1989	Radio Tower	Lighting	186	8/10/2000	Grambauer Face	Lightning	794
8/19/1991	Flat Creek	Lighting	610	8/10/2000	Cliff Point	Lightning	6,660
10/16/1991	-	Lighting	498	8/10/2000	Loop L.N.F.	Lightning	635
10/16/1991	-	Lighting	7,869	8/10/2000	Green Mountain	Lightning	510
10/16/1991	-	Warming Fire	3,551	8/10/2000	Prospect	Lightning	236
10/17/1991	Spruce Lake 2	Lightning	225	8/10/2000	Kedzie Creek	Lightning	229
10/18/1991	Turner Ck Sylvanite	Lighting	425	8/10/2000	Pulpit Mountain	Lightning	205
5/7/1992	Wapiti	Campfire	160	8/10/2000	No Seem Creek	Lightning	167
8/4/1992	Three Goats	Lightning	209	8/10/2000	Studebaker Draw	Lightning	165
8/14/1994	17 Mile	Other	1,715	8/10/2000	Upper Beaver	Lightning	9,423
8/14/1994	Little Wolf	Lightning	4,838	8/10/2000	Roderick South	Lightning	317
8/14/1994	Pulpit	Lightning	2,023	8/10/2000	Lydia Mtn.	Lightning	5,895
8/14/1994	Lost Girl #2	Lightning	400	8/10/2000	Lucky Point	Lightning	423
8/14/1994	Lost Girl #1	Trash Burning	200	8/11/2000	East Thunder 14	Lightning	691
8/14/1994	Blacktail	Powerline	100	8/11/2000	Runt	Lightning	423
8/14/1994	South Alaska Peak	Brakeshoe	100	8/11/2000	Obrien	Lightning	226
8/14/1994	Sheep Range 3	Lightning	5,897	8/11/2000	Stone Hill	Lightning	11,115
8/14/1994	Scenery 1	Lightning	3,245	8/11/2000	Fan Creek	Lightning	785
8/14/1994	Scenery 2	Warming Fire	1,245	8/11/2000	Kelsey Creek	Lightning	2,768
8/14/1994	Sheep Range 2	Other	600	8/11/2000	Feeder Mtn 2	Lightning	274
8/14/1994	Sheep Range 1	Warming Fire	600	8/12/2000	Okaga	Lightning	454
8/14/1994		Lightning	564	8/12/2000	Young J	Lightning	875
8/14/1994	Williams Creek #1	Lightning	275	8/17/2000	Engle	Lightning	225
8/14/1994	Hanging Flower	Other	160	7/9/2001	Libby Creek	Campfire	135
8/14/1994	Lamoka	Lightning	100	8/28/2001	Barnum Creek	Miscellaneous	325
8/15/1994	Twin Meadows	Lightning	750	7/20/2003	Ross Creek	Lighting	195
8/15/1994	336	Lightning	660	8/7/2005	Camp 32	Miscellaneous	800
8/15/1994	Hanging Flower	Other	160	9/6/2006	Ross Scree	Lightning	215
8/15/1994	High One	Lightning	1,300	9/7/2006	Ross Junior	Lightning	585



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**Table 4.2-2. Wildfire Listings >100 Acres in Lincoln County**

Date	Name	Cause	Acres	Date	Name	Cause	Acres
8/15/1994	Mckay 3	Other	418	7/27/2007	Brush Creek	Lightning	29,921
8/15/1994	North Fork Big Crk	Lightning	9,000	7/26/2008	Parmenter	Campfire	130
8/15/1994	Webb Knob	Lightning	3,500	9/2/2009	Lawrence Mtn	Lightning	2,400
8/15/1994	Zimmerman Hill	Lightning	785	8/26/2011	Ariana 2	Children	200
8/15/1994	Maxine Point	Lightning	440	8/11/2015	Weigel	Lightning	100
8/15/1994	Gunsight	Other	800	8/11/2015	Marston	Lightning	7,000
8/15/1994	Roberts	Warming Fire	1,000	8/14/2015	Berray Mountain	Lighting	4,966
8/15/1994	Upper Fowler	Lightning	2,470	8/14/2015	Poplar Point	Lightning	1,005
8/15/1994	Cripple Horse		564	8/14/2015	Chippewa	Lightning	565
8/15/1994	Parmenter	Lighting	190	8/14/2015	Government Mtn.	Lighting	376
8/15/1994	Survey Mountain	Field Burning	139	8/14/2015	Tepee Mountain	Lightning	1,018
8/15/1994	Smith Peak	Lightning	1,522	8/14/2015	Klatawa	Lightning	4,681
8/15/1994	Banfield #2	Lightning	994	8/15/2015	Sawtooth	Lightning	2,680
8/15/1994	Leigh Creek	Slash Burning	760	10/5/2015	Smearl	Campfire	177
8/15/1994	Twin Peak	Other	110	2016	Redemption	Lightning	102
8/16/1994	Pink Mtn	Other	600	8/7/2017	Gibraltar Ridge	Lighting	12,938
8/16/1994	Devil's Club #2	Lightning	800	8/11/2017	Caribou	Lighting	24,752
8/16/1994	Studebaker	Slash Burning	1,592	8/12/2017	Tamarack	Lighting	407
8/16/1994	Devil's Dad	Lightning	430	8/30/2017	West Fork	Lighting	20,032
8/16/1994	Goat Rocks	Lightning	450	8/30/2017	Moose Peak	Lighting	13,887
8/16/1994	Pillick Ridge	Trash Burning	500	8/30/2017	Reader	Lighting	106
8/22/1994	Fish Fry	Blasting	1,420	8/30/2017	Cub Creek	Lighting	5,839
8/22/1994	Burnt Sheep	Field Burning	320	8/30/2017	Miller Creek	Lighting	4,700
8/23/1994	Will Do	Powerline	233	9/2/2017	Weasel	Lighting	3,856
8/24/1994	Willard 3	Fireworks	335	7/29/2018	Davis	Lightning	4,135
8/27/1994	Drift Peak	Lightning	104	7/31/2018	Ten Mile	Lightning	681
8/28/1994	Thunderhill	Trash Burning	170	8/11/2018	Gold Hill	Lightning	6,700
4/30/1995	S. Fk. Bull River	Lightning	395	8/12/2018	Sterling Complex	Lightning	1,405

Source: DNRC, 2018; USFS-Kootenai National Forest, 2018; Notes: "-" indicates no data available; NR = Not Reported

Federal wildfire disasters were declared in Lincoln County in 1994 and 2000. State-wide wildfire disasters have been declared in 1979, 1988, 1991, 1992, 1996, 1998, 1999 and 2003 (DES, 2018). FEMA authorized Fire Management Assistance Grants in Lincoln County to help with firefighting costs for the Houghton Creek Fire in 1984 (FSA-2048), the Moose Peak Fire in 2017 (FM-5211), and West Fork Fire (FM-5209) in 2017.

The largest fire to occur in Lincoln County was in 1910 and is described below:

*The summer of 1910 was unusually dry with fires beginning as early as June that year. Steady heat through July and August caused the forest to become extremely tinder dry. At that time, the Forest Service was still in its infancy, and did not have the manpower to staff the Forests. Available crews were already battling many small blazes in Idaho and western Montana during the summer. Firefighters had to use pack trains to bring in crews and equipment. No major roads were yet in place, and the terrain was forested and steep. In August, strong southwest winds flamed the many small fires and turned them into raging infernos, merging small blazes into larger ones that swept through the country with unbelievable speed. Calls for help were relayed by telegraph and thousands of firefighters, homesteaders and miners fled the area for their lives to the safety of Missoula or Spokane, Washington. The fire burned a path 30- to 50-miles wide, with over 100 square miles of timber burned in Montana. The town of*



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*Sylvanite was burned to the ground. The fire came as close as three miles to the City of Troy and over 200 people manned fire lines to keep the fire from consuming Libby. Within 48 hours, most of the damage was done from the blaze. Blackened tree stumps can still be seen in areas of the Kootenai Forest today as reminders of the 1910 fire. As a result of the devastation of that summer's fires, Congress authorized the first national fire protection system for the nation's forests in 1911. (Source: <http://www.libbymt.com/community/history.htm>).*

Since 1910, Lincoln County has witnessed many large, uncharacteristic wildfires. Sixty thousand (60,000) acres burned during the 1994 fire season. In 2000, the area experienced another record fire season with 270 fires burning a total of 45,465 acres. That year the Kootenai National Forest managed four large fire complexes, requiring eight incident management teams. Firefighting resources were stretched so thin that military resources were ordered along with an incident management team from Australia. These fires were the result of drought and accumulation of hazardous fuels. Large, uncharacteristic fires can be expected to continue given current conditions. The 2000 fire season did not result in the loss of lives or homes, but the potential was present. Homeowners in the Pinkham Creek area were advised to evacuate when fires made a dangerously close run near many homes.

MHMP Planning Team members indicated that recent years have seen 50 to 60 days without rain which has resulted in lower fuel moisture. The number of wildfire ignitions are down but the number of acres burned is up. The average number of fire starts on the Kootenai National Forest was 140, now the average is 80. The 2015 fire year saw 35,000 acres burned. The 2017 fire season saw 85,000 acres burned, the worst year since 1910. In 2018, sixty-eight (68) wildfire starts burned 20,000 acres. Descriptions of several recent wildfires are presented below.

September 2017. The Caribou fire tore through a portion of the state's oldest Amish community in the West Kootenai area west of Eureka. The fast-moving fire destroyed 11 homes and nearly 30 outbuildings after making an unexpected 4½ mile run over the course of a few hours. The fire consumed every burnable thing there. Trees were totally stripped of their limbs, bark and needles became a forest of blackened toothpicks. A cargo trailer had its sides completely melted. A 40-foot by 80-foot shop with an apartment overhead was reduced to a heap of rubble. It was like a tornado involving fire. Residents were placed under a pre-evacuation notice on the night before the fire made its run. The frantic call for a mandatory evacuation came at about 6 p.m. the next day. There was hardly time to evacuate. The Amish loaded up their buggies and pointed horses down the only road in or out of the area. The fire burned 25,000 acres (600 acres of private forest). (The Western News, *Finding Strength Through Loss: Amish Family Prepared Journey to Rebuild After Losing Home to Fire*, September 10, 2017). According to the MHMP Planning Team, the USFS has since put in fire breaks on the west side of the area and an emergency road was built with access into Canada.

August 2018 - Pinkham Tower Fire which burned 333 acres started near Pinkham Mountain and burned up and around the communications sites. Fire crews had earlier reduced fuels and done protection preparation around the communications sites which succeeded in minimizing damage to the tower infrastructure. (Flathead Beacon, *Multiple Structures Lost to Glacier Park Wildfire*, August 13, 2018).



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The Libby area has some unique challenges when it comes to wildfire suppression due to the Libby Asbestos Superfund Site. The affected area is referred to as Operable Unit (OU) 3 and encompasses a five-mile radius of the mine property. According to the MHMP Planning Team, there have been no fire starts in OU3 to date; however, during the summer of 2018, two fires burned in the outer perimeter Modified Fire Response Zone. One of these fires, the Highway 37 Fire is described below. Further details on the Libby Asbestos Superfund Site with regard to wildfire are presented in the *Vulnerability and Area of Impact* section of this hazard profile.

July 2018 – Local, state and federal officials have long worried about a wildfire near the former W.R. Grace vermiculite mine, ground zero for the Libby asbestos contamination because of contaminated dirt and soil in the area. Officials have feared that a large wildfire near the old mine could release asbestos-laden ash into the air. On the Kootenai National Forest near Libby, the Highway 37 fire burned about 70 acres, about one mile away from the Libby Superfund Site’s OU3 which is part of the EPA’s Libby Asbestos Superfund site. The fire was first discovered shortly after 3:30 p.m. and within 30 minutes had grown from a half acre to 68 acres, fueled by hot and dry conditions. Because of the proximity to the former mine site, local and federal firefighters aggressively attacked the blaze from the ground and air using eight helicopters and nine fixed-wing aircraft. Five different firefighting crews were deployed, including a 10-person contract crew specially trained and equipped to operate in and near the asbestos-laced forest, supported by aircraft and heavy machinery. In four hours, the helicopters dropped more than 220,000 gallons of water on the fire from the nearby Kootenai River. (Independent Record, *Northwest Fires Smolder On*, July 26, 2018). Health officials monitoring situation, ready to deploy air quality monitors if needed. The fire was human-caused (Flathead Beacon, *Firefighters Aggressively Attack Wildfire Near Libby Vermiculite Mine*, July 20, 2018).

The Montana DNRC has primary responsibility for fire protection on all private and State lands within Lincoln County. They have a reciprocal agreement with the U.S. Forest Service where both agencies exchange blocks of land for fire protection purposes. In the agreement, the State agrees to protect an agreed upon number of acres of federal land in exchange for the USFS protecting acres of private land within the forest boundary. This agreement and coordination with volunteer fire departments provides for efficient wildland fire protection in Lincoln County.

Lincoln County completed a Community Wildfire Protection Plan (CWPP) in 2003 that was updated in 2005 and again in 2013. This document is presented in **Appendix E**. Mitigation projects identified in the CWPP are incorporated herein by reference. The Lincoln County CWPP is scheduled to be updated again in 2019.

### **Vulnerability and Area of Impact**

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The primary concern during a wildfire event is for the safety of the community’s residents. Other concerns include the threat to homes, structures, fences, power lines, communication sites or other infrastructure, such as major transportation routes. Homes are often located at the forest edge or in the forest itself; built out of flammable materials (wood siding and other flammable materials); constructed near the end of gulches with only one escape route or on steep hillsides with narrow, winding roads; and built on lands without adequate water. While the site or building material may be chosen for its aesthetic merit, it often has few or none of the qualities essential for the safety of both the home and its occupants in the event of a fire.



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The last decade in Lincoln County has seen new homes and other structures built near and around national forests. Should fires occur, these structures within the wildland-urban interface (WUI) are very vulnerable. The WUI is defined as the line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels. A WUI exists anywhere that structures are located close to natural vegetation and where a fire can spread from vegetation to structures, or vice versa. A WUI can vary from a large housing development adjacent to natural vegetation to a structure or structures surrounded by vegetation. As people, homes, and structures continue to occupy the WUI and as hazard fuels continue to accumulate, a high risk and volatile situation needs to be addressed. The WUI boundary extends two miles beyond clusters of private, non-corporate land with known structures. The Lincoln County FireSafe Council recommends that the WUI extend onto federal lands where the private lands abut federal lands. **Figure 5** presents the wildfire hazard area from the Lincoln County CWPP.

Lincoln County also identifies evacuation routes and municipal watersheds as WUI. Evacuation routes provide safe ingress/egress to communities. Many areas with homes in Lincoln County have only one way in/out. Municipal watersheds include the infrastructure necessary to deliver the water and the areas that contribute water flow within the watershed. An intense wildfire in the Flower Creek Municipal Watershed could overwhelm the capacity of the City of Libby's water system to handle additional sedimentation. Libby does not have a backup water supply and would be faced with a potential crisis to supply the basic human needs for potable water and sanitation. 429 acres of State DNRC land in on slopes north and above the lower Flower Creek reservoir were treated in 2008. An additional 570 acres of state land were treated in 2017-2018 on steep slopes north of and above the upper Flower Creek reservoir. Fuel treatments were accomplished in Oct 2018.

The Forest Services is also completing fuel mitigation in the lower one-third of the Flower Creek watershed basin, encompassing 33 percent of the entire watershed located near, or adjacent to the City of Libby water supply. This project area has been experiencing tree mortality from root disease and mountain pine beetle for several years. In response, the focus of this project is increasing forest resilience to insects and disease, reducing fuel accumulations, and maintain or improving water quality and native aquatic species.

The selected alternative will result in one timber sale with harvest activities completed by the end of 2021, and slash disposal and reforestation activities to be completed later. The Forest Service has been working in partnership with the State of Montana to increase the pace and scale of forest restoration. As part of the Governor's Forests in Focus Initiative, Montana DNRC contributed \$60,000 toward Flower Creek for timber sale preparations to accelerate implementation activities. Once the Forest Service portion of the project is completed, most of the area around the municipal water supply will have been treated.

Areas associated with OU3 of the Libby Asbestos Superfund Site create unique public health concerns to both firefighters and the general public. Libby amphibole (LA) asbestos dust has been detected on the bark of trees in the Kootenai National Forest near the closed W.R. Grace Vermiculite Mine property and creates possible exposure to Forest Service personnel, interagency firefighters, and other emergency managers who may need to work in the area. OU3 is a 10,000-acre site, most of which is heavily forested, that includes the former mine and areas impacted by releases of asbestos from the mine such as creeks, the Kootenai River, settling ponds, the surrounding forest, and Rainy



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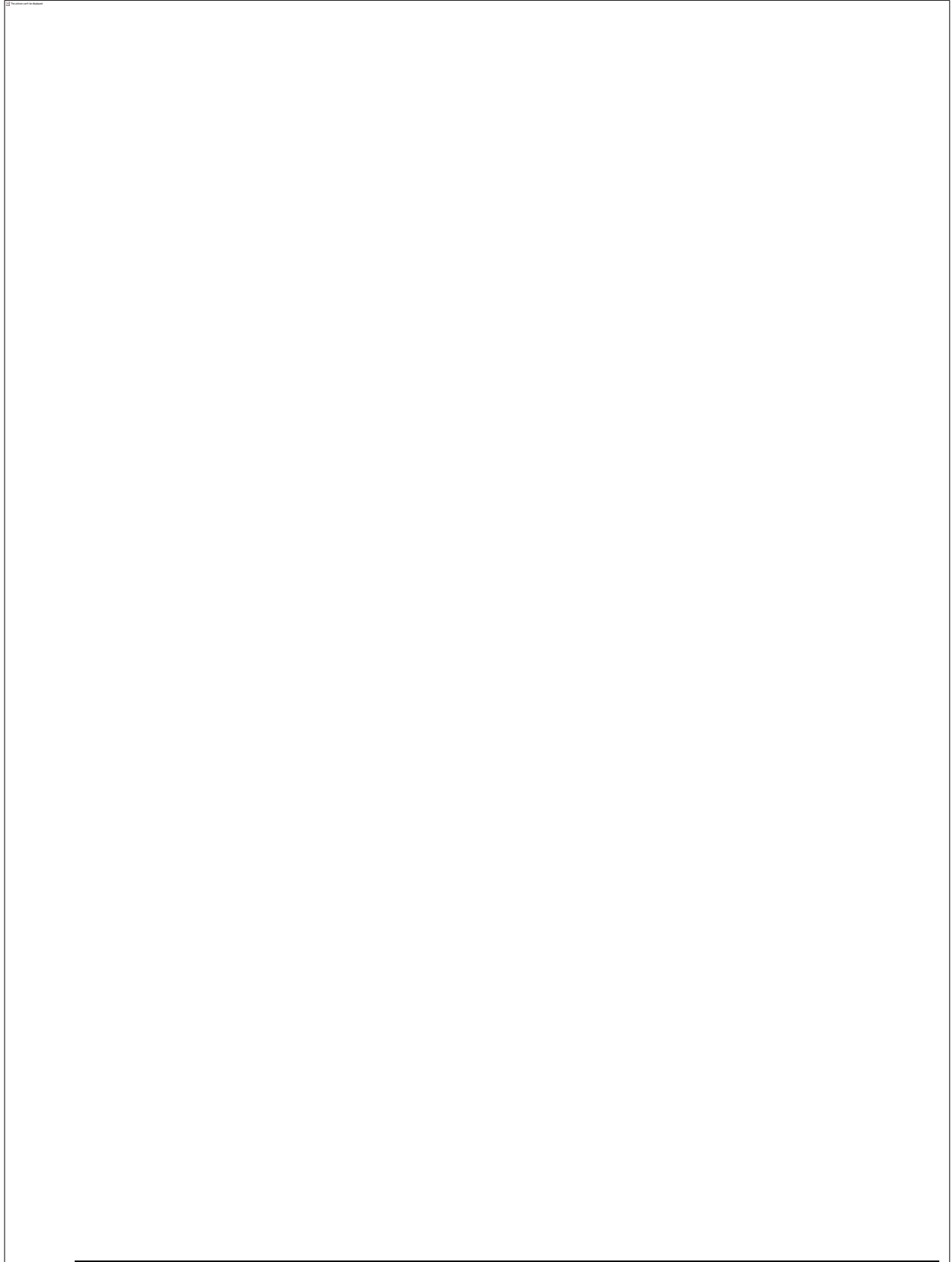
Creek Road. OU3 used to encompass about 35,000 acres directly north of Highway 37, but its parameters were shrunk in 2017 after the EPA conducted tests that found the soil was not as contaminated in the other acres. Despite the change in parameters, the USFS still designates the area directly north of Highway 37 as a “Modified Fire Response Zone” (**Figure 5A**).





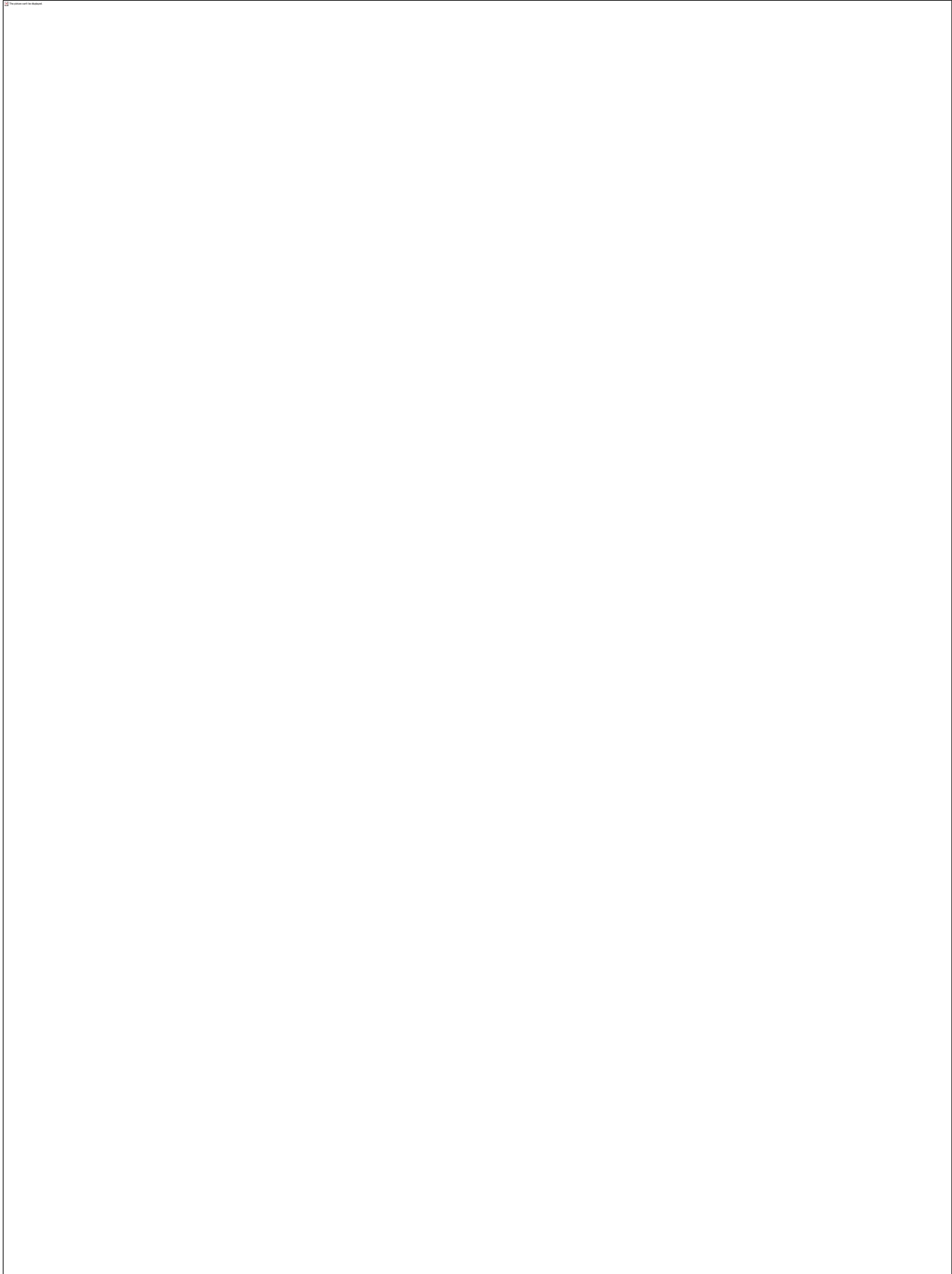
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In June 2015, EPA and USFS jointly issued an Action Memorandum for OU3 of the Libby Asbestos Superfund Site. The memorandum addresses the release or threat of release of LA on federal, state, and private lands that could result from a wildfire in OU3. Any wildfire would be expected to generate ash from the burning or incineration of available forest fuels, including forest duff and tree bark that, in OU3, is contaminated with LA. Because asbestos is resistant to fire, the LA would concentrate in the wildfire ash during a fire and may result in the potential exposure of firefighters to LA-contaminated wildfire ash during firefighting and firefighting mop-up activities. LA-contaminated ash could also migrate off OU3 during or after a fire.

Given the potential threat to human health, the EPA and USFS recognized that immediate steps were necessary to address the threat of a release of LA that could result from a wildfire in OU3. They authorized heightened fire preparedness actions to enhance fire suppression effectiveness including the staging of a helicopter in Libby that would respond to wildfires in OU3. They would also include the staging of heavy equipment (e.g., dozer and lowboy) and a team of specially trained and equipped firefighters stationed in Libby who would fight fire in hazardous material suite, i.e., personal protective equipment, to prevent exposure to LA. Staging aerial and ground resources close to OU3 would enable firefighters to commence an initial attack on a wildfire as quickly and effectively as possible. An immediate response to a lightning strike or other sign of fire could prevent a small fire from growing into a large fire in OU3 that could potentially release LA.

It was recognized that during a fire, LA-contaminated wildfire ash could be mobilized and become airborne in smoke and wind and be redeposited over large or small areas, depending on fire activity and weather conditions. During and after a fire, both wildfire ash that becomes airborne and is redeposited and wildfire ash that remains localized on the ground could migrate through erosion by wind or surface water run-off.

The Libby Asbestos Response Plan (LARP) was adopted in March 2018. The purpose of the LARP is to plan for a unified source of public information during a wildfire within the area impacted from asbestos contamination. The LARP references burn chamber tests show that when released through burning, the vast majority of LA fibers remain in the ash with very little release in the smoke. In the event of a plume dominated fire, the possibility of additional depositing of LA fibers into the surrounding area becomes a realistic outcome. If fire does enter OU3, the Lincoln County Health Department will deploy mobile air-quality monitoring stations to inform messaging to the public and assist with the making any necessary public health recommendations. Health officials will use information from those monitoring stations to determine if a shelter-in-place orders needs to be issued to local residents.

Smoke from wildfires outside OU3 also has the potential to impact Lincoln County residents. Health effects associated with forest fire smoke exposure has been studied by the Centers for Disease Control (CDC). Researchers found the risk of hospital admission for respiratory and circulatory illness was greater during periods of heavy smoke than unexposed areas (CDC, 2001). Smoke blows into Lincoln County from the west and Canada. Montana Dept. of Environmental Quality (DEQ) sends health warnings to schools on hazardous smoke conditions recommending the suspension of athletic events. Smoke also affects things like road safety and tourism.



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There is a great concern in Libby over the prolonged heavy smoke from a wildfire that would create a serious health problem for residents at risk of respiratory problems. The community of Libby has an unusually high incidence of asbestosis. Any major wildfire with heavy smoke accumulation would no doubt exacerbate the problem and result in a dramatic increase in doctor visits and hospital admissions.

Wildfires dramatically change landscape and ground conditions, which can lead to increased risk of flooding during heavy rains or snowmelt because the burned ground is unable to absorb the falling rain, producing runoff conditions. Because of this, even modest runoff events over a burned area can result in flash flooding or increased stream discharge downstream. Further discussion on this issue is presented in *Section 4.4 - Flooding*.

### Probability and Magnitude

The history of wildfires, the terrain, and asbestos-contaminated forests has prompted Lincoln County to identify wildfire as a significant hazard. Smoke from fires both within and outside of the county can create poor air quality. Sensitive groups, such as the elderly and residents with respiratory illness can be affected. The MHMP Planning Team indicated that no lives have been lost in Lincoln County directly related to wildfire.

Major wildfires can have a tremendous financial impact in any community. Local businesses frequently suffer major losses, particularly when wildfires occur during the peak tourist season. Picturesque views of the forested landscapes are an important reason people live in and visit Libby. A wildfire will impact the aesthetics of the area which can further impact property values and economic activity.

Although the primary concern is to structures and the interface residents, most of the costs associated with fires, come from firefighting efforts. As past events have also shown, infrastructure such as power transmission lines and communication towers can also be threatened.

Wildfire does not present a uniform risk across Lincoln County with regards to structures. As such, the area of impact used in the MHMP analysis consisted of the WUI layer from the 2013 Lincoln County CWPP. **Figure 5** presents the wildfire hazard impact area used for the MHMP analysis.

To complete the vulnerability analysis for this project, GIS was used to intersect the wildfire hazard area with the building stock and critical facility datasets. Vulnerable population was calculated using U.S. Census county estimates. Exposure values are presented in **Table 4.2-3**. Building exposure reflects only the monetary structure value and does not account for improvements or personal effects that may be lost to wildfire.

Table 4.2-3. Lincoln County Vulnerability Analysis - Wildfire

Category	Lincoln Co. (balance)	Libby (city)	Troy (city)	Eureka (town)
Residential Property Exposure \$	\$761,100,952.00	0	0	0
# Residences at Risk	5,941	0	0	0
Commercial & Industrial Property Exposure \$	\$343,774,630	0	0	0



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Table 4.2-3. Lincoln County Vulnerability Analysis - Wildfire

Category	Lincoln Co. (balance)	Libby (city)	Troy (city)	Eureka (town)
# Commercial & Industrial Properties at Risk	1,863	0	0	0
Critical Facilities Exposure Risk \$	\$46,970,012	0	0	0
# Critical Facilities at Risk	72	0	0	0
Bridge Exposure \$	\$45,662,700	0	0	0
# Bridges at Risk	66	0	0	0
Persons at Risk	7,221	0	0	0
Persons Under 18 at Risk	2,420	0	0	0
Persons Over 65 at Risk	3,512	0	0	0

GIS analysis of the wildfire risk to Lincoln County indicates that 1,008,747 acres (42.9 percent) are within the wildfire hazard impact area. According to the vulnerability analysis, 5,941 residences, 1,863 commercial and industrial buildings, and 72 critical facilities are at risk to wildfire in Lincoln County. The *Wildfire* section in **Appendix C-2** lists the critical facilities and bridges within the wildfire hazard area.

Wildfires generally occur more than once per year in Lincoln County and therefore, the probability of future events are rated as “highly likely”.

### Future Development

The Lincoln County subdivision regulations include design and improvement standards for new subdivisions in WUI areas in order to: improve access to and defensibility of developments, homes and other property; minimize the potential spread of fire from wildland areas to structures and from structure fires to wildland areas; permit efficient suppression of fires; insure that new subdivisions in the WUI provide water supply systems with suitable access for firefighting crews and apparatus; and, educate property owners, residents, and people that they have a responsibility for prevention of wildland fire on their own property.

All subdivisions must be planned, designed, constructed, and maintained so as to minimize the risk of fire to include: the design of subdivisions in cooperation with the jurisdictional fire protection entity; FireWise covenants; and, adequate water supply or approved mitigation.

For unincorporated areas of Lincoln County, an analysis of the wildfire hazards on the subdivision site, as influenced by existing vegetation and topography, must be performed. The subdivider is required to provide a vegetation management plan to provide a strategy for reducing fire potential including clearing five feet on each side of public access roads of all vegetation. Foresters inspect land before subdivision approval.

Subdivision water systems are required to supply a minimum of 1,000 gallons per minute for a minimum of 30 minutes and be located within two miles from the subdivision. Water delivery must be either through pressurized hydrant systems, dry hydrants or manmade storage systems.



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Developments with more than 30 dwelling units must provide at least one separate emergency access or egress road.

### **Climate Change**

Montana has been on a steady warming trend for decades, up over 3 degrees F since 1950, and all projections are that it will continue. The summer of 2017 was the second warmest on record since 1950 at 4 degrees F above average, and the persistent high temperatures coupled with the record lowest rainfall in July and August shifted the relatively wet conditions of spring into extreme drought by mid-summer followed by a severe wildfire season (Whitlock et.al., 2017).

The climate future with respect to wildfire will include additional warming with less precipitation in the summer months which set the stage for drier conditions and more fires. Over the next century, extreme heat days (above 90 degrees F) are projected to increase by an additional 5-35 days across the state. And, as a result of greater drought, forest fires will likely increase in size, frequency, and possibly severity.

In a given year, warmer weather and less precipitation dries out fuel loads and creates conditions for rapid fire spread. Fire records dating back decades to millennia show a clear link between warmer temperatures, lower precipitation and an increase in the number of fires and acres burned. Since 1986, wildfire seasons are nearly 80 days longer, with increases in large fires and fires at high elevations (Whitlock et.al., 2017).

Larger, more severe, and more frequent fires may impact the people, property and critical facilities by increasing the risk of ignition from nearby fire sources. Climate change also may increase winds that spread fires. Faster fires are harder to contain, and thus are more likely to expand into residential neighborhoods.

Secondary impacts, such as air quality concerns and public health issues, will likely increase due to smoke from wildfire. Wildfire smoke generates a lot of particulate matter 2.5 microns or less in diameter. Those particles are so small, they easily bypass most of the human body's defenses and move directly from the lungs into the bloodstream. A recent study demonstrates that smoke waves are likely to be longer, more intense, and more frequent under climate change, which raises health, ecologic and economic concerns.



### 4.3 Hazardous Material Incidents / Transportation Accidents

CPRI scoreS:  
 haz-mat incidents = 3.2  
 HIGHWAY ACCIDENTS = 2.85

#### Description and History

The hazardous material and transportation accident hazards have been combined into one profile because they often occur together. Hazardous material incidents also occur at fixed facilities which in Lincoln County include bulk propane facilities, gas stations and propane distributors. Transportation accidents can occur on the highways, railroad, or in the air and often result in fatalities and injuries but rarely in property loss unless hazardous materials are involved. Because of the potential for future incidents involving hazardous materials on the transportation corridors in Lincoln County these two hazards are profiled together. The Libby Asbestos Site is discussed in the Wildfire and Disease profiles in Sections 4.2 and 4.6, respectively.

#### Hazardous Material Incidents

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 materials, including petroleum products and chemicals, are commonly stored and used in Lincoln County and are regularly transported via the region’s roadways and railroads. A release of hazardous materials from both fixed and transportation incidents pose possible threats involving emergency response. Hazards range from small spills on roadways to major transportation releases on railways contaminating land and water. No pipelines moving petroleum products exist in Lincoln County.

Hazardous material incidents in Lincoln County have mostly been minor. Records of hazardous material events from 1990 to 2016, available from the National Response Center database, are summarized in **Table 4.3-1**. There have been no Presidential disaster declarations associated with the hazardous material incident hazard in Lincoln County.

**Table 4.6-1. Lincoln County Hazardous Material Incidents; 1990 - 2018**

Incident Date	Type of Incident	Incident Cause	Location	Nearest City	Suspected Responsible Party	Quantity Spilled/ Material Name
11/13/1991	Mobile	TA	US Hwy 2 Hwy 2	Libby	Unknown	20 gal. Diesel
8/13/1994	Fixed	Other	Stimson Lumber Yard	Libby	Stimson Lumber Co.	250 gal. PCBs
9/1/1994	Aircraft	Unknown	Lower Hanging Valley Lk	Libby	Erickson Aircrane Co.	Hydraulic Oil
9/28/1995	Fixed	OE	17115 Hwy 37	Libby	USACE	0.5 gal. Oil
2/27/1996	Mobile	EF	Hwy 37	Libby	JTL Group	2,000 gal. Diesel
1/14/1997	US	Unknown	First Ave East	Eureka	Unknown	2.25 lbs. Mercury
1/8/1997	Mobile	OE	Othorp Lake Rd	Eureka	Private Citizen	10 gal. Motor Oil
6/24/1997	Fixed	Unknown	17115 Hwy 37	Libby	USACE	5 gal. Hydraulic Oil
6/30/1997	Mobile	OE	39604 US Hwy 2 South	Libby	Lincoln Co.	Oil
11/26/1997	Mobile	OE	Highway 37	Libby	Trimac Transportation	45 gal. Diesel
11/4/1998	Fixed	Dumping	Tetrault Lake	Eureka	MFWP	30 drums Rotenone
9/6/1999	Fixed	Other	Kootenai R. / L. Koocanusa	Eureka	British Columbia Prov.	75,000 gal. Chlorinated Effluent
5/15/2001	Mobile	EF	Kootenai River / MP 75	Rural	Unknown	120 gal. Diesel
3/31/2002	Fixed	Dumping	Wisconsin Ave.	Libby	Private Citizen	Unknown



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**Table 4.6-1. Lincoln County Hazardous Material Incidents; 1990 – 2018**

Incident Date	Type of Incident	Incident Cause	Location	Nearest City	Suspected Responsible Party	Quantity Spilled/ Material Name
5/30/2003	Fixed	Dumping	Plant Near Kootenai River Bridge	Libby	W.R. Grace	Asbestos Laden Vermiculite
1/13/2004	Mobile	EF	Libby Dam Project	Libby	USACE	0.5 gal. Hydraulic Oil
4/18/2005	Vessel	VS	Koocanusa Reservoir	Libby	Private Citizen	1 qt. Gasoline
6/5/2005	ST	Dumping	1302 West Hwy 2	Libby	Hamlet Industries	Oil
12/21/2006	Fixed	EF	17115 Hwy 37	Libby	USACE	5 gal. Turbine Oil
2/15/2007	ST	OE	875.5 Hwy 2 South	Libby	International Paper	50 gal. Penta/ Creosote Oil
2/19/2009	Mobile	EF	501 Mineral Ave.	Libby	Moore Oil	50 gal. Diesel
9/4/2009	Mobile	TA	654 North Central	Libby	Ramp Sand & Gravel	Diesel
10/1/2009	Fixed	EF	56 S. Mine Rd	Troy	Troy Mine-Rivette Minerals	Tailings & Water
2/11/2010	US	Unknown	17877 MT Highway 37	Rural	Unknown	Oil
10/9/2011	Pipeline	EF	Hwy 56 (MP 24)	Troy	Troy Mine-Rivette Minerals	1,677-gal, copper tailings
11/28/2011	Mobile	Dumping	233 Shalom Drive	Libby	US EPA	15 cy Asbestos
6/5/2013	Mobile	EF	Hwy 37, 15 Mi W of Eureka	Eureka	Ferrell Gas	1,680 gal. Propane
8/15/2014	Fixed	NP	17877 MT Highway 37	Libby	USACE	3 ounces Oil
4/26/2017	Fixed	Unknown	17877 MT Highway 37	Libby	USACE	1 cup Oil

Source: National Response Center, 2018 (<http://www.nrc.uscg.mil/>).

Notes: EF = Equipment Failure; NP = Natural Phenomenon; OE = Operator Error; ST = Storage Tank; TA = Transportation Accident; US = Unknown Sheen; VS = Vessel Sinking.

In addition to the hazardous material incidents listed above, the MHMP Planning Team indicated that propane accidents comprise the most frequent haz-mat incidents in Lincoln County and occur a couple of times each year. Someone recalled a propane truck carrying propane canisters having an accident which resulted in a fire. There is no natural gas in Lincoln County so many residents use propane to heat homes.

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. EPCRA Section 313 requires the U.S. EPA and the states to annually collect data on releases and transfers of certain toxic chemicals from industrial facilities and make the data available to the public in the Toxics Release Inventory (TRI). In 1990 Congress passed the Pollution Prevention Act which required that additional data on waste management and source reduction activities be reported under TRI. The goal of TRI is to empower citizens, through information, to hold companies and local governments accountable in terms of how toxic chemicals are managed. One active TRI facility is located in Lincoln County (**Table 4.3-2**).

**Table 4.3-2 - Toxic Release Inventory – Total Aggregate Releases; 2013-2016**

Facility/Year	Total On-Site Disposal or Other Releases	Total Off-Site Disposal or Other Releases	Total On- and Off-site Releases / Chemical	Chemical
<b>US CBP Roosville Port of Entry #MT008, 7915 Highway 93 North, Eureka, MT</b>				
2016	398	0	398	Lead
2015	371	0	371	
2014	299	0	299	





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**Table 4.3-2 - Toxic Release Inventory – Total Aggregate Releases; 2013-2016**

Facility/Year	Total On-Site Disposal or Other Releases	Total Off-Site Disposal or Other Releases	Total On- and Off-site Releases / Chemical	Chemical
2013	246	0	246	

Source: U.S. EPA, 2018; ([https://iaspub.epa.gov/triexplorer/tri\\_release.chemical](https://iaspub.epa.gov/triexplorer/tri_release.chemical))

According to the U.S. Border Patrol, hazardous materials do not generally enter the U.S. from Canada at the Port of Roosville in Lincoln County; most petroleum products from Canada enter at the Port of Sweetgrass, to the east. Commodities entering the U.S. through the Port of Roosville consist mainly of gravel and lumber.

Many facilities in Lincoln County sell or use hazardous materials including gas stations and fuel distributors. Locations of facilities in Lincoln County with Tier II reporting requirements are listed in **Table 4.3-3**. A hemp facility in Eureka uses a large quantity of methanol and has plans to expand. There is no record of a release from this facility.

**Table 4.3-3. Lincoln County Tier II Hazardous Material Reporters**

Facility Name	Location
BNSF Railway Company - Twin Meadow / Flathead Tunnel	Railroad MP 1263.5, Trego
BNSF Railway Company - Wolf Prairie	Railway Mile Post 1283, Wolf Prairie
Bonneville Power Admin - Libby Substation	16500 MT Hwy 37, Libby
CSV Libby Propane Plant	36205 US Hwy 2, Libby
CSV Propane Plant Eureka	495 US Hwy 93, Eureka
Frontier Libby Business Office	114 E. Fourth Street, Libby
Frontier Pinkham Mountain Microwave	Pinkham Mountain
Frontier Telecommunications - Eureka Central Office	1st Avenue West and 5th Street, Eureka
Frontier Troy Central Office	402 2nd Street & Kootenai, Troy
Libby Dam	17877 MT Hwy 37, Libby
Moore Oil Inc (76 Plant)	34036 Hwy 2, Libby
Moore Oil Inc. (Exxon-Libby office)	206 E 1st Street, Libby
Moore Oil Inc. (Warehouse)	250 Spencer Rd Ext, Libby
MTARNG Libby Readiness Center	1004 Treasure Ave, Libby
Northern Energy - Libby District Office and Bulk	31242 US Hwy 2, Libby
Northern Energy Libby - Rail Bulk	210 West Second Street, Libby
Roosville, MT Land Port of Entry	7915 Hwy 93 North, Eureka

Source: Lincoln County EMA, 2018

The Montana DEQ maintains a list of clandestine methamphetamine drug laboratory sites. Drug lab sites in Lincoln County are listed in **Table 4.3-3**. Methamphetamine labs typically require a hazardous material response. According to comments received at the MHMP public meeting, meth labs are not a big concern in Lincoln County.

**Table 4.3-3. Lincoln County Methamphetamine Contaminated Properties**

Date	City	Address	Date	City	Address
7/11/2002	Libby	386 Mahoney #1	3/29/2003	Troy	809 Missoula Ave #13
10/25/2002	Libby	5878 N Champion Haul Rd	4/7/2006	Eureka	355 Terning Dr W

Source: Montana DEQ, 2018; [http://deqrpts.deq.mt.gov/reports/rwserverlet?DEQ&report=MCP\\_ACTIVE\\_SITES\\_rep&paramform=no&p\\_col\\_1=COUNTY](http://deqrpts.deq.mt.gov/reports/rwserverlet?DEQ&report=MCP_ACTIVE_SITES_rep&paramform=no&p_col_1=COUNTY)



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The most likely location for a transportation-related hazardous material release would be along the highways or BNSF Railroad. The source and location of transportation accidents vary but the response is typically the same. Response is focused on determining the presence of hazardous materials and then assisting the injured. The regional hazardous-material response team closest to Lincoln County is positioned in Kalispell.

There have been no federal or state disaster declarations associated with the hazardous material or transportation accident hazard in Lincoln County and the likelihood of a significant event resulting in a disaster declaration is considered low.

### Highway Accidents

Car crashes occur in every community across the nation and can be devastating to families, friends, and communities. It is estimated that vehicle crashes cost the State approximately \$595 million in wage loss, medical expenses, insurance administration, and property damage. This figure does not account for the indirect costs of human suffering and loss resulting from these tragedies. Vehicular accidents occur for a number of reasons including distracted drivers, driver fatigue, drunk driving, speeding, aggressive driving, and weather. In Montana vehicle collisions with wildlife are a common occurrence. Statistics on highway accidents in Lincoln County over the past 10 years are presented in **Table 4.3-4**. Information is not available on whether these incidents involved a hazardous material response.

**Table 4.3-4. Lincoln County Vehicular Crash Data; 2008 - 2017**

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	TOTAL
<b>All Crashes</b>											
Fatal Crash	3	7	3	4	6	6	3	4	4	2	<b>42</b>
Serious Injury Crash	22	21	26	22	28	21	21	14	25	24	<b>224</b>
Total # of Crashes	310	304	253	258	259	233	264	257	261	308	<b>2,707</b>
<b>Nighttime Crashes</b>											
Fatal Crash	1	2	1	1	2	1	1	1	0	0	<b>10</b>
Serious Injury Crash	6	8	8	6	9	0	7	2	7	6	<b>59</b>
Total # of Crashes	99	107	80	86	78	75	73	66	85	88	<b>837</b>
<b>Rural Roadway Crashes</b>											
Fatal Crash	3	7	3	4	6	6	3	4	4	2	<b>42</b>
Serious Injury Crash	19	20	26	22	27	21	21	12	23	24	<b>215</b>
Total # of Crashes	232	250	202	202	222	201	220	192	218	259	<b>2,198</b>
<b>Winter Crashes</b>											
Fatal Crash	0	1	0	1	3	1	0	1	0	0	<b>7</b>
Serious Injury Crash	6	4	8	6	7	4	4	2	4	8	<b>53</b>
Total # of Crashes	144	119	110	99	117	90	101	82	111	143	<b>1,116</b>
<b>Wild Animal Involved Crashes</b>											
Fatal Crash	1	2	0	0	0	0	0	0	-	-	<b>3</b>
Serious Injury Crash	2	3	3	2	4	2	5	4	-	-	<b>25</b>
Total # of Crashes	50	62	54	58	58	60	65	53	-	-	<b>460</b>

Source: MDT, 2018 (<http://www.mdt.mt.gov/publications/datastats/crashdata.shtml>); Notes "-" = Data Not Available

There is no history of a mass casualty accident in Lincoln County involving a school bus or tour bus; however, school events use bus transport during winter months when severe weather can pose an



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extreme risk. From a healthcare perspective, over three patients is considered a mass casualty highway accident.

### Railroad Accidents

Burlington Northern-Santa Fe (BNSF) operates a rail line extending across southern Lincoln County. Recently a rail spur that served the Tobacco Valley was purchased from BNSF by a private company (Mission Mountain Railroad). Rail usage is still mostly based on lumber products.

Amtrak’s Empire Builder passenger train departs daily from the Libby Station traveling to the west coast in the morning and the east coast in the evening. The average capacity of the train is estimated to be 400 passengers. The Lincoln County Growth Policy states that approximately 4,000 people utilize this service per year. Amtrak is subsidized by the federal government and comes up frequently for renewal.

The Flathead Tunnel is a 7-mile long railroad tunnel approximately 28 miles west of Whitefish, near Fortine in Lincoln County. It is the second-longest tunnel in the U.S. Speed through the tunnel approximately 50 mph. MHMP Planning Team indicated that the tunnel is a concern for both railroad accidents and terrorism. All trains from the west coast heading across Montana’s Hi-Line pass through this tunnel. Twenty (20) to 30 trains use the tunnel each day including oil trains. Interruption of service could have economic consequences. There is a limitation of one train per 30 minutes through the tunnel due to the buildup of exhaust. The tunnel’s capacity is currently being upgraded with installation of new fan system which will more effectively flush fumes.

According to the National Transportation Safety Board (NTSB), 60 percent of all railroad accidents occur at unprotected or passive crossings. There have been three fatalities and three injuries at railroad crossings in Lincoln County in the past 40 years, as shown in **Table 4.3-5**. The MHMP Planning Team indicated that BNSF has dealt with a hazardous railroad crossing at 5<sup>th</sup> Street Extension in Libby; an alternate crossing was put in.

**Table 4.3-5. Lincoln County Accidents at Railroad Crossings: 1975 – 2018**

Date	Nearest Station	Road	Fatalities	Injuries	Crossing Protection
3/24/1976	Troy	Main Street Xing	1	0	Stop signs
6/12/1979	Troy	Third St	0	0	Gates
1/13/1980	Yaak	Private-Farm Xing	0	0	None
1/18/1980	Brimstone	Private-Fortine Cr	0	0	Cross bucks
11/30/1984	Tamarack	Redemption Road	0	0	Cross bucks
1/22/1985	Stryker	Forest Service Rd	0	0	Cross bucks
2/3/1987	Tamarack	Bacas Road	0	0	Cross bucks
1/28/1988	Fisher River	Richards Rd	0	1	Cross bucks
11/9/1988	Troy	Private Crossing	0	0	Cross bucks
2/10/1993	Tamarack	Redemption Rd	1	1	Stop signs
4/28/1994	Troy	Private-Coles Xing	0	0	Stop signs
1/12/1996	Libby	Riverside Road	0	0	Stop signs
11/19/1997	Kootenai Falls	Private	0	0	None
12/20/1999	Stryker	Westwood Road	0	0	Cross bucks
12/22/2001	Troy	Third St	0	1	Gates
3/3/2003	Fortine	Main Street	0	0	Cross bucks



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**Table 4.3-5. Lincoln County Accidents at Railroad Crossings: 1975 – 2018**

Date	Nearest Station	Road	Fatalities	Injuries	Crossing Protection
4/29/2005	Troy	Yaak Ave	0	0	Gates
12/2/2005	Stryker	Sunday Creek Road	0	0	Cross bucks
5/28/2008	Riverview	Butler Creek Road	0	0	Stop signs
9/26/2014	Troy	Private	1	0	None
12/20/2014	Libby	E 1 Mi 5 <sup>th</sup> St. Ext	0	0	Gates
<b>TOTAL</b>			<b>3</b>	<b>3</b>	

Source: Federal Railroad Administration, 2018;

<http://safetydata.fra.dot.gov/OfficeofSafety/publicsite/Query/gxrabbr.aspx>

Federal Railroad Administration data indicates that that between 1975 and 2018, sixty-one (61) railroad accidents occurred in Lincoln County, including nine derailments that involved railcars carrying hazardous materials. **Table 4.3-6** presents this data.

**Table 4.3-6. Lincoln County Railroad Accidents; 1975 – 2018**

Date	Nearest Town	Fatalities	Injuries	Cars Carrying Haz-Mat	Haz-Mat Cars Damaged	Comments
2/28/1975	Wolf Prairie	0	0	0	0	2 cars derailed
8/30/1975	Libby	0	0	0	0	5 cars derailed
11/24/1975	Yaak	0	0	0	0	1 engine and 30 cars derailed
12/16/1975	Kootenai Falls	0	0	0	0	30 cars derailed
3/11/1976	Kootenai Falls	0	0	0	0	24 cars derailed
4/20/1976	Eureka	0	0	0	0	1 engine derailed
10/22/1977	Libby	0	0	0	0	35 cars derailed
1/5/1978	Ripley	0	1	0	0	18 cars derailed
8/1/1978	Brimstone	0	1	0	0	2 engines and 10 cars derailed
2/18/1979	Ripley	0	0	0	0	2 engines and 37 cars derailed
6/3/1979	Riverview	0	0	0	0	Collision
8/15/1979	Troy	0	0	0	0	7 cars derailed
9/16/1979	Libby	0	1	0	0	Collision
1/20/1980	Wolf Prairie	0	0	0	0	3 cars derailed
3/28/1980	Yaak	0	0	0	0	18 cars derailed
7/27/1980	Kootenai Falls	0	0	0	0	8 cars derailed
8/31/1980	Libby	0	0	0	0	1 car derailed
9/25/1980	Wolf Prairie	0	0	0	0	12 cars derailed
12/4/1980	Kootenai Falls	0	0	0	0	1 car derailed
12/24/1980	Swamp Creek	0	0	0	0	2 cars derailed
3/29/1981	Riverview	0	0	0	0	2 cars derailed
9/23/1981	Troy	0	0	0	0	No information available
11/3/1981	Libby	0	0	0	0	Collision
2/23/1982	Fisher River	0	0	0	0	3 engines and 25 cars derailed.
5/26/1983	Ripley	0	0	0	0	26 cars derailed
8/2/1983	Kootenai Falls	0	0	0	0	1 car derailed
12/13/1983	Eureka	0	0	0	0	2 cars derailed
6/7/1984	Wolf Prairie	0	0	1	1	Haz-mat released from 1 car.
12/30/1984	Troy	0	0	0	0	10 cars derailed
1/2/1985	Riverview	0	0	0	0	1 car derailed
2/19/1986	Rock Creek	0	0	0	0	1 car derailed



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**Table 4.3-6. Lincoln County Railroad Accidents; 1975 - 2018**

Date	Nearest Town	Fatalities	Injuries	Cars Carrying Haz-Mat	Haz-Mat Cars Damaged	Comments
8/20/1986	Troy	0	0	2	1	20 cars derailed, haz-mat released from 1 car, 250 people evacuated
8/1/1987	Libby	0	0	0	0	2 cars derailed
9/4/1987	Twin Meadows	0	0	0	0	Equipment damage
4/3/1988	Kootenai Falls	0	1	0	0	7 cars derailed
5/12/1988	Tamarack	0	1	0	0	13 cars derailed
3/2/1989	Kootenai Falls	0	0	0	0	1 car derailed
5/15/1989	Libby	0	0	0	0	2 railcars on fire
7/29/1989	Libby	0	0	0	0	7 cars derailed
2/24/1990	Kootenai Falls	0	0	0	0	10 cars derailed
2/9/1991	Swamp Creek	0	0	0	0	4 cars derailed
9/16/1994	Brimstone	0	0	0	0	8 cars derailed
6/18/1996	Rock Creek	0	0	0	0	2 cars derailed
3/5/1998	Ripley	0	0	3	0	1 car derailed
3/26/2001	Yaak	0	0	0	0	Equipment damage
1/22/2002	Riverview	0	0	59	0	2 cars derailed
1/23/2002	Fisher River	0	0	1	0	1 car derailed
3/2/2002	Libby	0	0	0	0	Cable fire
12/20/2002	Eureka	0	0	0	0	1 engine and 1 car derailed
7/22/2003	Fisher River	0	0	1	0	13 cars derailed
3/7/2004	Kootenai Falls	0	0	0	0	Signal failure
11/24/2004	Rock Creek	0	0	2	0	No haz-mat released
5/25/2006	Fortine	0	0	0	0	2 cars derailed
5/28/2008	Riverview	0	0	1	0	Train collided with mow truck
8/4/2008	Wolf Prairie	0	0	0	0	11 cars derailed
3/29/2010	Troy	0	0	0	0	Equipment collision
6/23/2010	Libby	0	0	14	0	16 cars derailed
2/22/2011	Libby	0	0	0	0	18 cars derailed
3/20/2011	Troy	0	0	0	0	25 cars derailed
9/10/2015	Libby	0	0	0	0	Signal damage
11/17/2015	Libby	0	0	0	0	Tree fell on train while moving.
<b>TOTAL</b>		<b>0</b>	<b>5</b>	<b>84</b>	<b>2</b>	

Source: Federal Railroad Administration, 2018

<http://safetydata.fra.dot.gov/OfficeofSafety/publicsite/Query/incabbr.aspx>

Oil trains are a constant concern because of the catastrophic impacts that could result from a derailment that ruptures an oil tanker in town or into waterways. A derailment into the river could impact the fishery. According to a MHMP public meeting commenter, there are more oil trains passing through Lincoln County now than in 2011, but the number is down since it was at its height in 2015. It is common that these trains have over 100 cars with 1 million gallons of crude oil per train. There are also long coal and grain trains that transport commodities through Lincoln. One intersection in Libby that gets blocked on a regular basis; however, it is more an inconvenience than an issue with a blocked evacuation route.

### Aircraft Accidents



Multi-Hazard Mitigation Plan - Lincoln County, Montana  
December 2018

#### *Section 4: Risk Assessment and Vulnerability Analysis*

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Aviation accidents can occur for a multitude of reasons from mechanical failure to poor weather conditions to pilot error. They usually don't involve a hazardous material release but are often fatal to the occupants. Lincoln County has airports in Troy, Eureka and Libby. Heliports used for firefighting also are located in the Crystal Lakes subdivision west of Fortine, at the DNRC facility in Libby, and at the Upper Ford, Sylvanite, and Murphy Lake USFS Work Centers.

Aviation accidents can occur for a multitude of reasons from mechanical failure to poor weather conditions to pilot error. They are often fatal to the occupants. Federal Aviation Administration (FAA) database listings for aircraft accidents in Lincoln County are presented in **Table 4.3-7**.



**Table 4.3-7. Lincoln County Aircraft Accidents**

Date	Location	Deaths	Aircraft Type	Date	Location	Deaths	Aircraft Type
10/16/1983	Libby	0	Benson B8M	6/6/1999	Libby	1	D. Wayne Smith
3/4/1984	Libby	1	Eipper Quicksilver	4/8/2000	Libby	0	PZL-Bielsko SZD-
9/2/1985	Troy	0	Cessna 182A	7/10/2000	Libby	0	Keith Kinden
8/4/1991	Libby	1	Taylor Air	9/17/2001	Troy	0	Bell 205
5/27/1994	Libby	0	Bell 204B	4/27/2005	Eureka	0	Cessna 150L
9/1/1994	Libby	0	Sikorsky S-64F	5/2/2008	Libby	0	Stinson 108-3
7/26/1996	Libby	3	Piper PA-28R-200	12/19/2012	Libby	2	Beech B100
9/23/1996	Troy	0	Kaman HH-43 B/F	8/16/2015	Libby	0	Taylorcraft BC12D
7/4/1998	Libby	0	Garlick UH-1H	<b>TOTAL</b>		<b>8</b>	

Source: FAA, 2018; [http://www.faa.gov/data\\_research/accident\\_incident/](http://www.faa.gov/data_research/accident_incident/)

**Vulnerability and Area of Impact**

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.

Transportation of hazardous materials on highways and by the railroads could result in an accident that would have the potential to impact Lincoln County residents. Large quantities of propane and petroleum products are stored in various locations and transported by rail and truck through the county. Although there is no history of significant hazardous material incidents in Lincoln County; the potential is present.

The U.S. Department of Transportation issued an emergency restriction order on May 7, 2014 that requires railroad carriers to identify to the State Emergency Response Commission through which counties Bakken crude oil is being transported. The notification provides information regarding the estimated volumes and frequencies of train traffic per week and describes the petroleum crude oil expected to be transported and applicable emergency response information (USDOT, 2014). MT DES forwards copies of the notifications to county emergency managers for their information and dissemination.

Privately-owned vehicles provide transportation for individuals in Lincoln County using the federal interstate and state highway systems as well as county and private roads. Trucks and trailers carry interstate and intrastate cargo. Highway accidents caused by severe weather and high speeds occur frequently. Railroad related hazards such as derailments, toxic spill contamination, and vehicle collisions are a threat to Lincoln County residents. According to the NTSB, more than 80 percent of public railroad crossings do not have lights and gates, and 60 percent of all railroad accidents occur at these unprotected crossings. An accident involving the passenger railroad service could result in a mass casualty incident. According to the Lincoln County Growth Policy, a five-year goal is to improve the rail sidings at the Kootenai Business Park to be more safe and efficient. Currently the sidings are old and in need of significant repair or replacement.

**Probability and Magnitude**



## Section 4: Risk Assessment and Vulnerability Analysis

According to the U.S. Department of Transportation, Office of Hazardous Materials Safety, Lincoln County has had 34 hazardous material releases associated with commercial vehicle and rail accidents with reported damages, as shown in **Table 4.3-8**.

**Table 4.3-8. Lincoln County Hazardous Material Incidents with Damages**

Date	Location	Carrier	Quantity Released	Commodity Released	Damages	Mode of Transport
1/14/1972	Libby	Montgomery Ward	0	Acid Batteries	\$0	Highway
4/7/1972	Libby	E S B Inc.	0	Acid Batteries	\$0	Highway
3/9/1983	Troy	Occidental Chemical Corp	0	Fluoroboric Acid	\$0	Highway
8/20/1986	Troy	Korea Shipping America Inc.	3,047 gal.	Diethyl Ether	\$0	Rail
1/3/1987	Troy	D.C. Petroleum Inc.	4,795 gal	Gasoline	\$0	Highway
8/12/1992	Libby	Safety Kleen Corp	6 gal	Cleaning Liquid	\$100	Highway
2/27/1996	Libby	JTL Group Inc.	1,189 gal	Diesel Fuel	\$48,500	Highway
4/15/1998	Libby	Plum Creek NW Plywood	10 gal	Printing Ink	\$450	Highway
2/19/2009	Libby	Moore Oil Inc.	15 gal	Diesel Fuel	\$5,028	Highway
6/5/2013	Eureka	Ferrellgas L.P.	253 CF	LPG	\$23,236	Highway
12/21/2014	Libby	Phillips 66	15 gal	Diesel Fuel	\$5,055	Highway
<b>TOTAL</b>					<b>\$82,369</b>	

Source: U.S. Dept. Transportation, 2018; <https://hazmatonline.phmsa.dot.gov/IncidentReportsSearch/IncrSearch.aspx>

Notes: gal = gallon ; CF = cubic feet

To model the spatial distribution of hazardous material incident risk a GIS data layer of transportation arteries was used, which included highways, major roadways, railroads, and pipelines. Fixed facilities, including TRI and Tier II sites, were added to this layer and it was then buffered by 0.25 miles. **Figures 6, 6A, 6B, and 6C** present the hazardous material buffer in Lincoln County, Libby, Troy, and Eureka and shows the vulnerability of critical facilities to hazardous material incidents. For security reasons, pipeline routes are not shown on the hazard impact maps but were included in the analysis.

**Table 4.3-9. Lincoln County Vulnerability Analysis – Haz-Mat Incidents**

Category	Lincoln Co. (balance)	Libby (city)	Troy (city)	Eureka (town)
Residential Property Exposure \$	\$277,202,132	\$77,445,096	\$25,777,421	\$26,186,506
# Residences at Risk	2,453	860	327	286
Commercial & Industrial Property Exposure \$	\$102,846,040	\$59,015,646	\$8,906,587	\$10,256,935
# Commercial & Industrial Properties at Risk	535	255	62	53
Critical Facilities Exposure Risk \$	47	31	14	\$10,407,857
# Critical Facilities at Risk	\$48,820,500	\$2,085,400	\$845,000	13
Bridge Exposure \$	\$48,820,500	\$2,085,400	\$845,000	\$244,000
# Bridges at Risk	48	5	1	1
Persons at Risk	2,976	1,068	397	426
Persons Under 18 at Risk	997	358	133	143





**Section 4: Risk Assessment and Vulnerability Analysis**

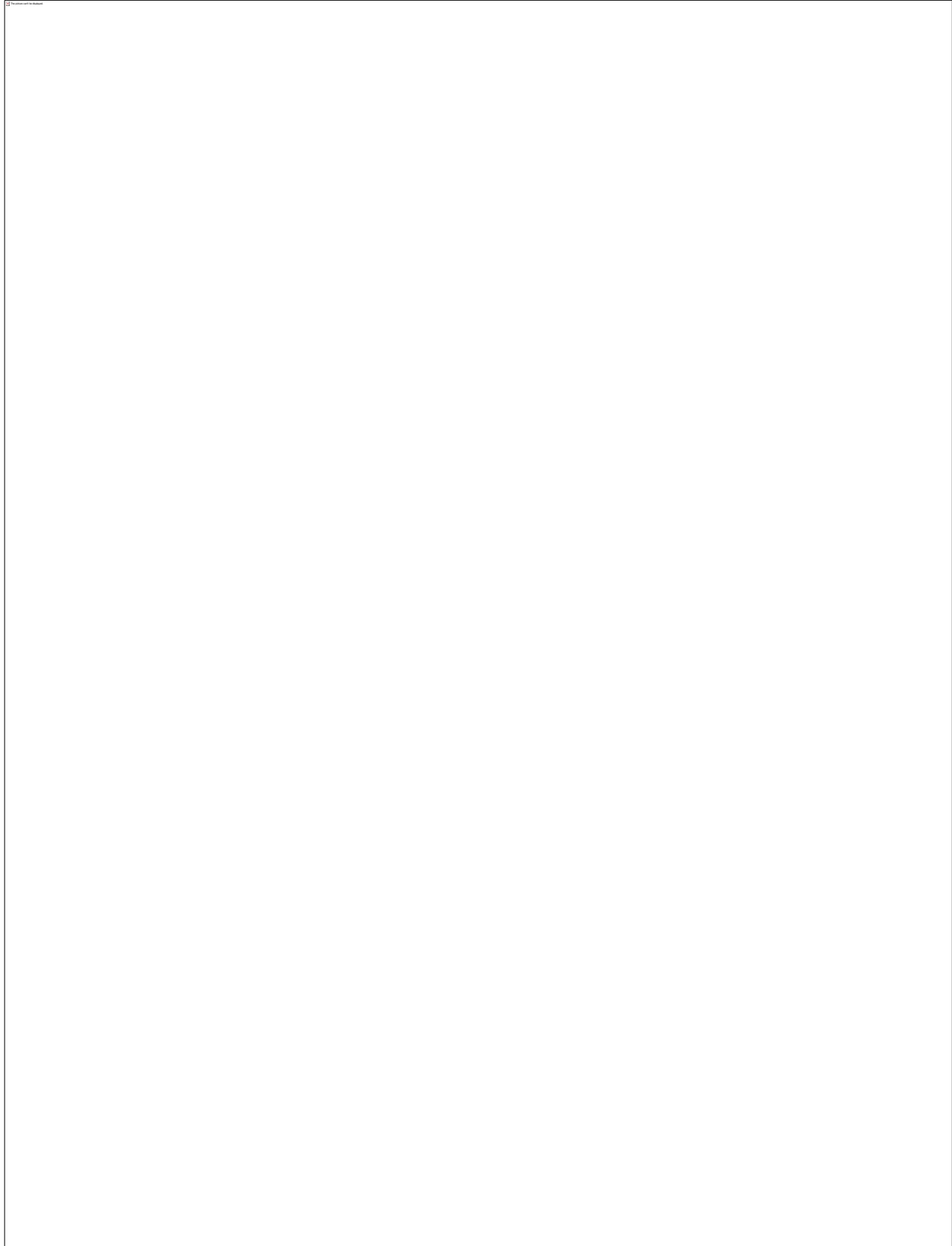
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Table 4.3-9. Lincoln County Vulnerability Analysis – Haz-Mat Incidents

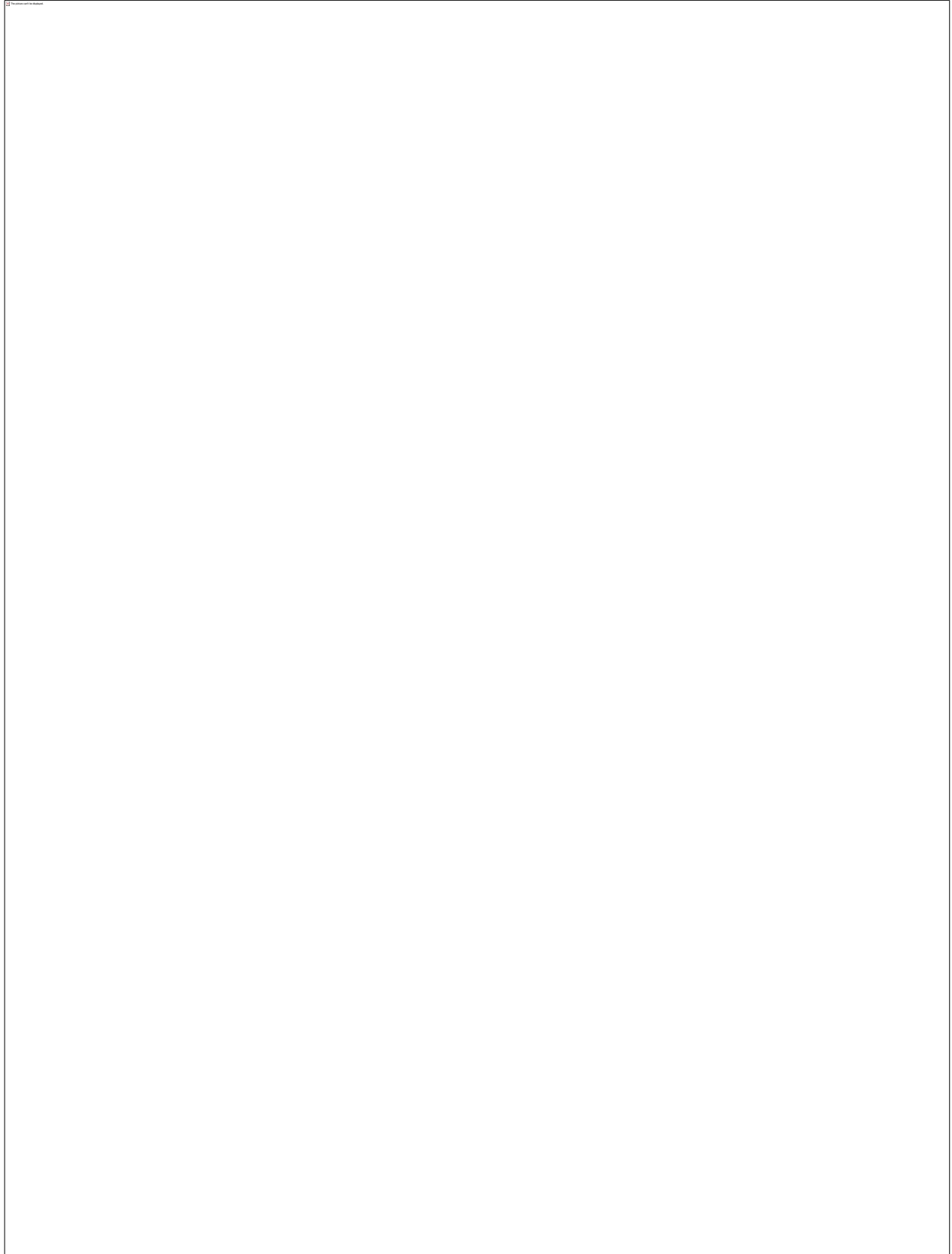
Category	Lincoln Co. (balance)	Libby (city)	Troy (city)	Eureka (town)
Persons Over 65 at Risk	1,447	683	193	289



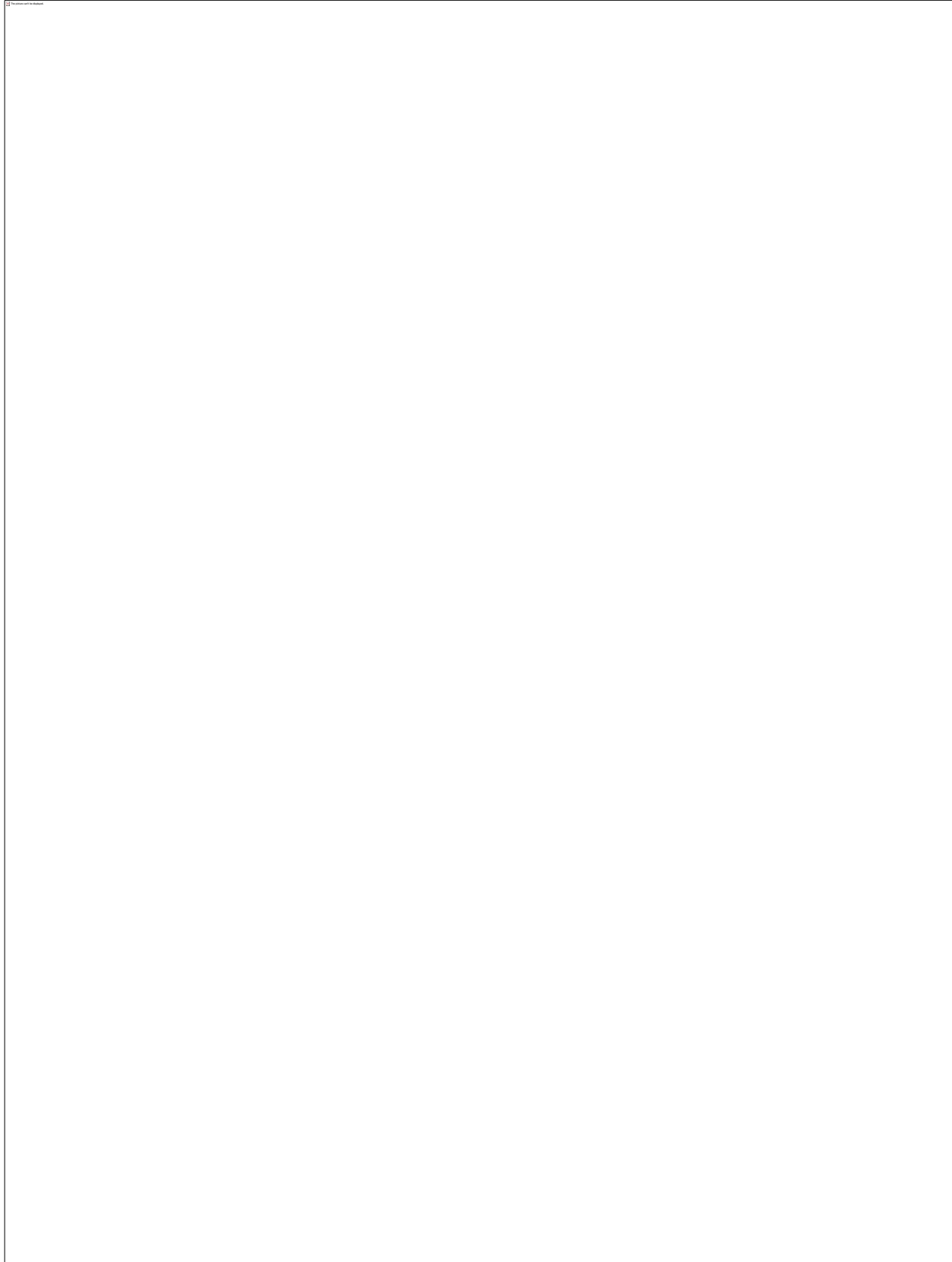
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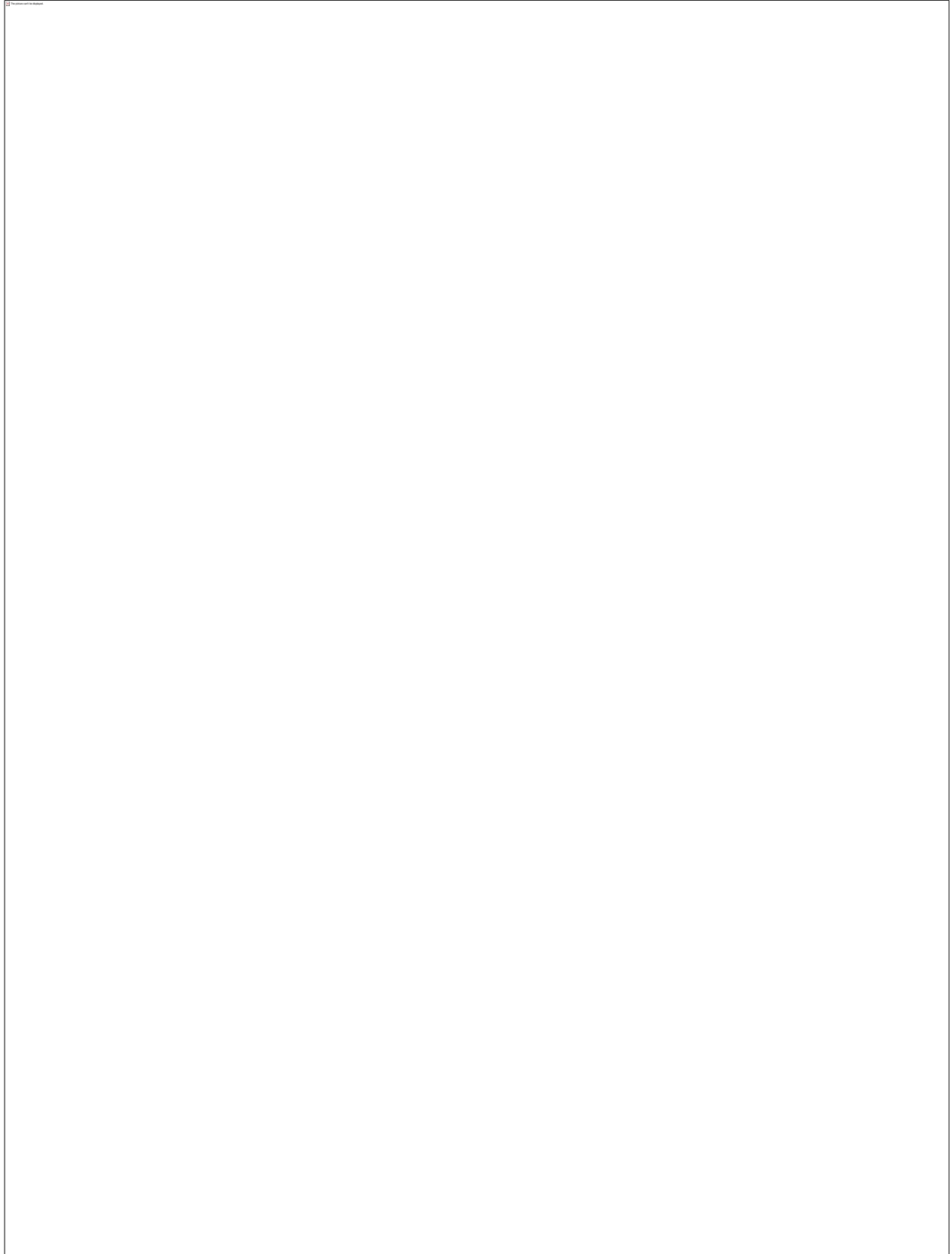
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## *Section 4: Risk Assessment and Vulnerability Analysis*

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The GIS analysis indicates that there are over 131,270 acres in Lincoln County (5.6 percent) in the hazardous material buffer including 3,926 residences, 905 commercial and industrial buildings, and 105 critical facilities. The *Hazardous Material Incident* section in **Appendix C** lists the critical facilities within the hazardous material transportation buffer.

Lincoln County is vulnerable to all types of transportation emergencies. The magnitude of a transportation accident event would be determined by many factors including the location of impact and number of passengers. Little, if any, warning exists for transportation accidents. The greatest magnitude event would be one where mass fatalities result. A mass casualty incident involving a Amtrak train or school bus is also a possibility and a concern since rural locations have limited resources making response time slow which could delay treatment of the injured.

In the past 10 years, there have been over 250 motor vehicle accidents in Lincoln County that resulted in fatalities and/or serious injuries. Therefore, the probability of future highway accidents is rated as “highly likely”.

The history of hazardous material incidents in Lincoln County indicates 29 minor events over the past 29 years. As such, the probability of future events is rated as “highly likely”; an event that happens at least once a year. The magnitude of any hazardous material event would depend on the amount and material spilled.

Lincoln County is vulnerable to vehicular accidents. A mass casualty incident involving a school bus is also a possibility and a concern since remote locations have limited resources making response time slow which could delay treatment of the injured. In the past 10 years, there have been 2,707 motor vehicle accidents in Lincoln County, including 42 crashes involving fatalities and 224 crashes producing severe injuries. Therefore, the probability of future transportation accidents is rated as “highly likely”. The MHMP Planning Team rated the railroad and aviation accident hazards as “likely”.

### **Future Development**

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Lincoln County has no land use regulations that specifically restrict building around industrial facilities or along transportation routes or in the vicinity of facilities that store large quantities of hazardous materials or petroleum products. However, impacts to public health and safety are considered for all new subdivisions.

### **Climate Change**

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Hazardous material incidents and transportation accidents are not expected to increase as a result of climate change. No increase in exposure or vulnerability to the population, property, or critical facilities are expected to occur. Climate change is not anticipated to directly impact the transportation accident hazard. Secondary impacts to public health may result due to increased smoke from wildfire activity which may increase highway accidents.



4.4 Flooding

CPRI SCORE = 2.85

Description and History

A flood is a natural event for rivers and streams. Excess water from snowmelt and rainfall accumulates and overflows onto the banks and adjacent floodplains. Floodplains are lowlands, adjacent to rivers and lakes that are subject to recurring floods. A flash flood generally results from a torrential (short duration) rain or cloudburst on a relatively small drainage area. Ice jam flooding occurs when pieces of floating ice carried by the streams current accumulate at an obstruction to the stream. The water held back can cause flooding upstream, and if the obstruction suddenly breaks, flash flooding can then occur downstream as well. Flash floods have the potential to occur, especially after a wildfire. Dam and levee failure flooding is included as a separate hazard profile in Section 4.9.

It is estimated that flooding causes 90 percent of all property losses from natural disasters in the United States and kill an average of 150 people a year nationwide. Most injuries and deaths occur when people are swept away by flood currents and most property damage results from inundation by sediment-laden water. Faster moving floodwater can wash buildings off their foundations and sweep vehicles downstream. Bridges, and other infrastructure can be damaged when high water combines with flood debris. Basement flooding can cause extensive damage to the structure and systems of a building.

Warming periods, which may be accompanied by rainfall, cause tributaries to swell rapidly. The resulting flood flows may be localized or basin-wide and may last from hours to several days depending on temperature, amount of rainfall, soil moisture content, and soil permeability. Rain on snow events are also the source of flooding in Lincoln County. The MHMP Planning Team indicated that fall flooding has also occurred in the area.

The National Weather Service provides short-term forecasts and warnings of hazardous weather to the public by producing regularly-scheduled severe weather outlooks and updates on various forms of hazardous weather including heavy rain and flooding. A “watch” is issued when conditions are favorable for severe weather in or near the watch area. A “warning” is issued when the severe weather event is imminent or occurring in the warned area. Warning and Advisory Criteria for flooding is presented in Table 4.4-1.

Table 4.4-1. Warning and Advisory Criteria for Flooding

Flooding	Warning Description
Flash Flood Watch	Issued when conditions are favorable for flash flooding. It does not mean that flash flooding will occur, but it is possible
Flash Flood Warning	Flash flooding is imminent, water levels rise rapidly with inundation occurring in less than 6 hours.
Flood Watch	Issues when conditions are favorable for flooding. It does not mean flooding will occur, but it is possible.
Flood Warning	Flooding is expected to occur more than 6 hours after the causative event.

Source: National Weather Service, 2018

Flood Insurance Studies prepared for Lincoln County (FEMA, 2006), Libby (FEMA, 2006), and Eureka (FEMA, 1979) recount the severe flood events described below.



## *Section 4: Risk Assessment and Vulnerability Analysis*

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December 1933 - Bobtail Creek, Callahan Creek, Granite/Big Cherry Creek, Fisher River, Kootenai River, Lake Creek, Libby Creek, Swamp Creek experienced flooding. The following are excerpts from the December 28, 1933 issue of The Western News: *One of the most disastrous floods ever to visit the western part of Lincoln County followed rain on top of a heavy snowfall. All creeks went on wild rampages. In the immediate vicinity of Libby, damage consisted of the flood's carrying out half of the Granite/Big Cherry Creek bridge south of the city and also part of the bridge over Libby Creek. The highway between Libby and the main Granite Creek bridge was badly cut up, with deep holes in many places...one of the worst pieces of destruction was along Fisher River where the stream parallels the highway. The entire roadbed was washed out for about two miles and earthen slides from the hillsides came down over what was left. A jam formed at the Bobtail Creek bridge and diverted the stream down the roadbed, a cut of eight to 10 feet for a considerable distance.* Another article in the same issue specifically discussed flooding near Troy: *Callahan Creek went on a rampage first tearing out the upper bridge and carrying it about 300 yards downstream. Next in its path of destruction was the bridge on the main highway, from which it tore the approach on the north bank, leaving a gap of about 200 feet between the bridge and bank. Lake Creek, too, was usually high, flooding meadows and filling the dam to within about 7 feet of the top.*

May 1948 - The Kootenai Valley experienced another severe flood. Warm weather came suddenly and melted heavy snows in the mountains all along the stream's course from Kootenai National Park in British Columbia on south through Montana and northwest back through Idaho into Canada. The Bull Dam near Wardner (in Canada) failed releasing dammed waters which added to the high water coming down into Montana and Idaho. Flood waters coming in from Libby Creek, Flower and Parmenter Creeks were backed up by higher waters in the Kootenai making it impossible for the stream to handle them. The waters from Libby Creek spread over much of the northeast part of the city. Many residence basements filled from the underflow which threatened foundations. Much damage was done to low farm lands and buildings on low banks up and down the river.

January 1974 - The Kootenai River basin and the lower Clark Fork basin experienced heavy flooding following heavy rains. Rain began in most of the area on January 13 and continued for 4 days at the rate of approximately 1 inch per day. Precipitation in the Yaak area totaled 6.12 inches for the period of January 13-17. Preceding the flood, varying amounts of snow covered most of northwestern Montana. Most of the flood damage in the Kootenai River basin centered around the Cities of Libby and Troy. The flooding in the area near Libby was caused by Big Cherry, Flower, Libby, and Parmenter Creeks, and although the incorporated area of Libby did not suffer extensive flooding, water covered much of the surrounding area to the west and south where many homes and businesses were located. The American Red Cross reported that 1,500 people in the Libby area were evacuated and 200 homes were flood damaged. In Libby, it was also reported that two houses and six mobile homes were swept away by floodwaters. Roads and bridges suffered most of the damage. U.S. 2 was closed to traffic for 5 days by mudslides and bridge washouts. Segments of Forest Service roads were completely destroyed when floodwaters covered the entire valley floor of several of the smaller streams. The Tobacco River left its banks in places and deposited ice in the low-lying areas near the Lincoln County Electric Co-op and park. Lincoln County received a Presidential disaster declaration for the 1974 flood.

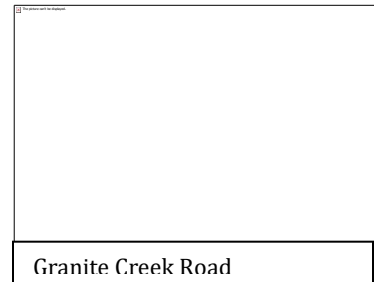




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January 2011 - The flood was brought on by an ice jam that broke loose upstream and clogged the bridge at Balsam Street. Weather patterns were similar to those that brought flooding in 1996, and the flood followed a similar route, but an effective response helped keep impacts to a minimum. The first report of water in a basement near Flower Creek came in around 3:30 a.m. on Monday, and within half an hour an incident command organization started taking shape. City crews were already standing by with equipment and sandbags, and they responded along with county crews and several private contractors. By the time the waters receded, around two dozen homes on Nevada and Cabinet avenues had experienced flooding, but the damage was much less widespread than it had been in 1996. Unlike that event, the town was never cut off on its east-west axis. Another big difference from 1996 was that flooding wasn't a problem on Parmenter Creek. Mitigation efforts undertaken in 2000 that widened the creek, built levees and an overflow channel were very effective in reducing the flood risk. Additional attention is being paid to a closer analysis of temperatures, precipitation and creek flows to allow for more advance warning. (Kootenai Valley Record, *Lessons from 1996 Credited with Reducing Flood Damage*, January 30, 2011).

December 2015 - A State of Emergency was declared on December 10<sup>th</sup> after three days of rain and melting snow which caused flooding in area streams and rivers. Many area streams were at or over flood level, including the Fisher River, Libby Creek, Granite Creek and Yaak Creek. Reports of damage including several homes along Callahan Creek near Troy and undermining or washing away of roads in several locations including Granite Creek Road and Trainer Street in Libby and St. Regis Road in Troy. Callahan Creek in Troy was nearly to the bridge with fast moving water with ice chunks and logs being carried down with the fast-moving flow. Minor washouts occurred near Keeler Creek and Lake Creek. ([www.Libby.com](http://www.Libby.com), *Lincoln County Flooding*, December 10, 2015 and *Heavy Rain Causes Flooding Around NW Montana*, December 11, 2015).



The MHMP Planning Team members also indicated that the Kootenai River flooded in 2013/14 from an elevated dam release; and, Libby Creek had a minor flood in fall 2017.

Presidential Disasters due to flooding were declared in Lincoln County in 1974, 1996, and 1997. State flood emergency declarations were granted to the City of Libby in 1997 and 2011 (DES, 2018).

### Vulnerability and Area of Impact

Development in floodplains results in a concurrent risk of property damage due to floods and impacts on city services for risk protection during flood season. Digital Flood Insurance Rate Maps (DFIRMs) for some areas within Lincoln County were updated in 2006. All construction after the adoption of these maps must be in accordance with these maps and floodplain regulations. **Figures 7, 7A, 7B and 7C** present the flood-prone areas within Lincoln County, Libby, Troy and Eureka, respectively.

The Kootenai River has a history of periodic flooding in some of the developed areas along the valley, including the communities of Libby and Troy. According to the Lincoln County Flood Insurance Study (FEMA, 2006), Kootenai River flood damages were not limited to that resulting from overtopping banks. The high water levels of the Kootenai River during regional flood events affect the free flowing characteristics of its tributaries. Of particular importance are Bobtail, Callahan, Flower, Libby,



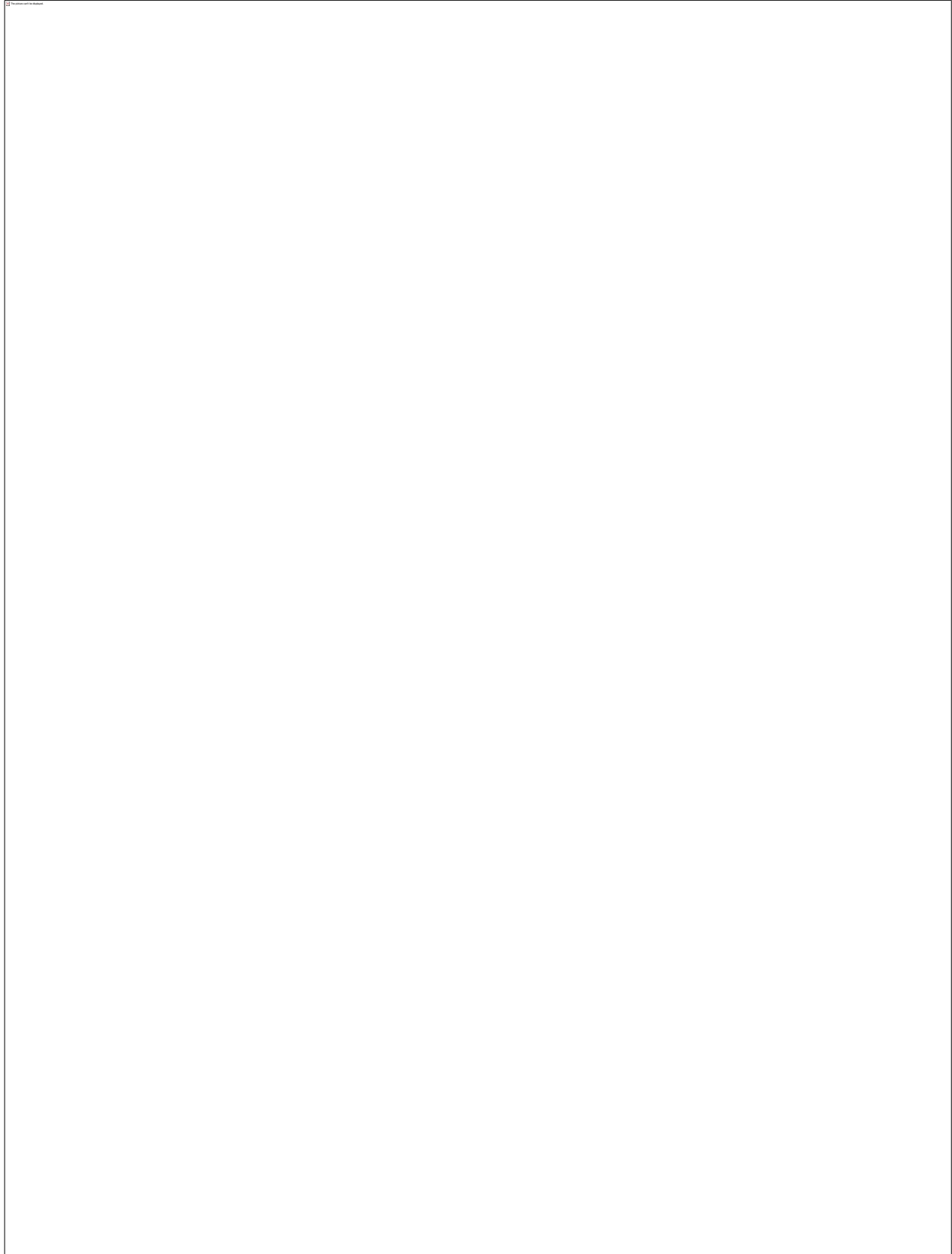
#### ***Section 4: Risk Assessment and Vulnerability Analysis***

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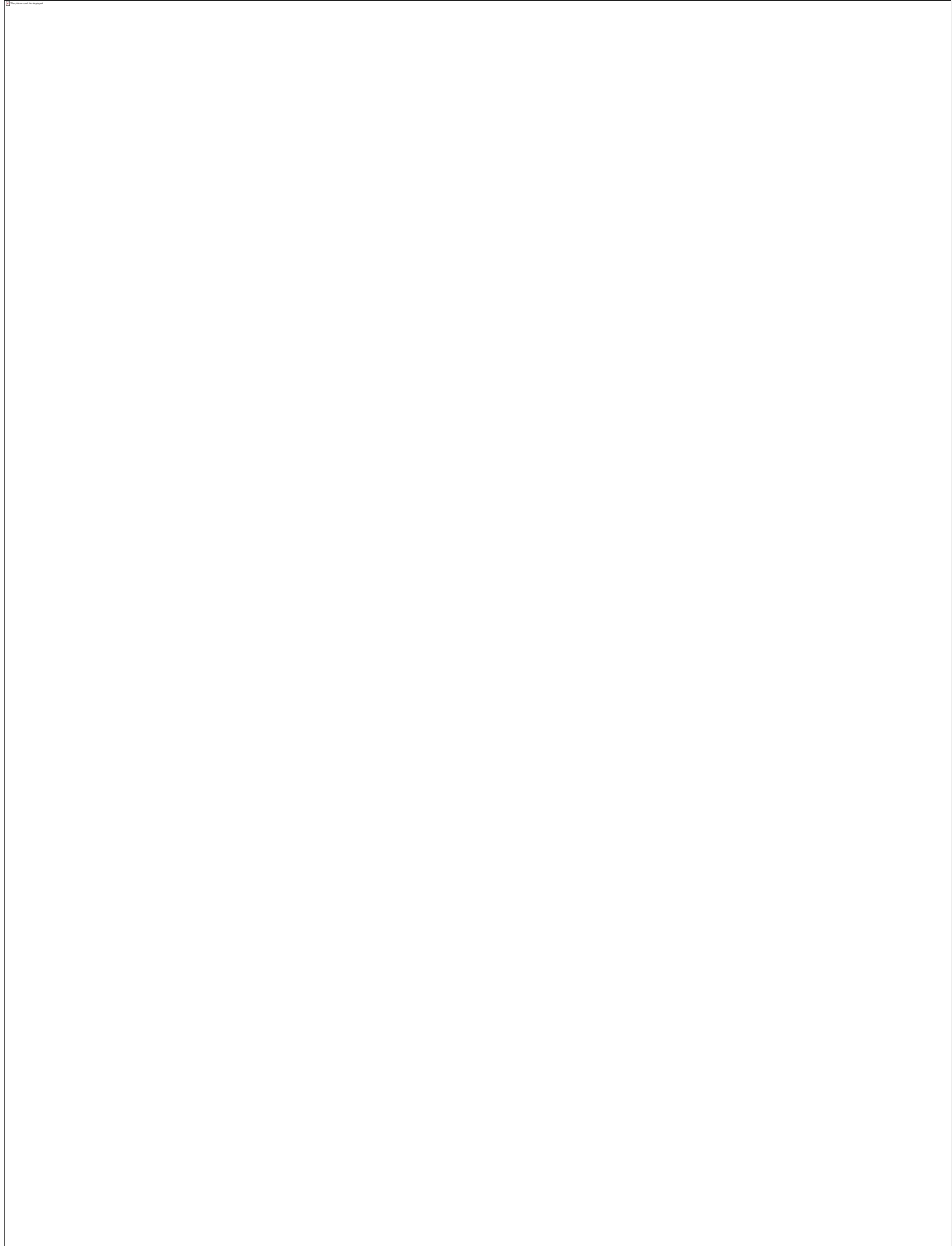
Parmenter, Quartz and Lake Creeks; the high-stage of the Kootenai River creates a backwater effect on the tributaries such that they leave their banks and cause flooding throughout the valley before



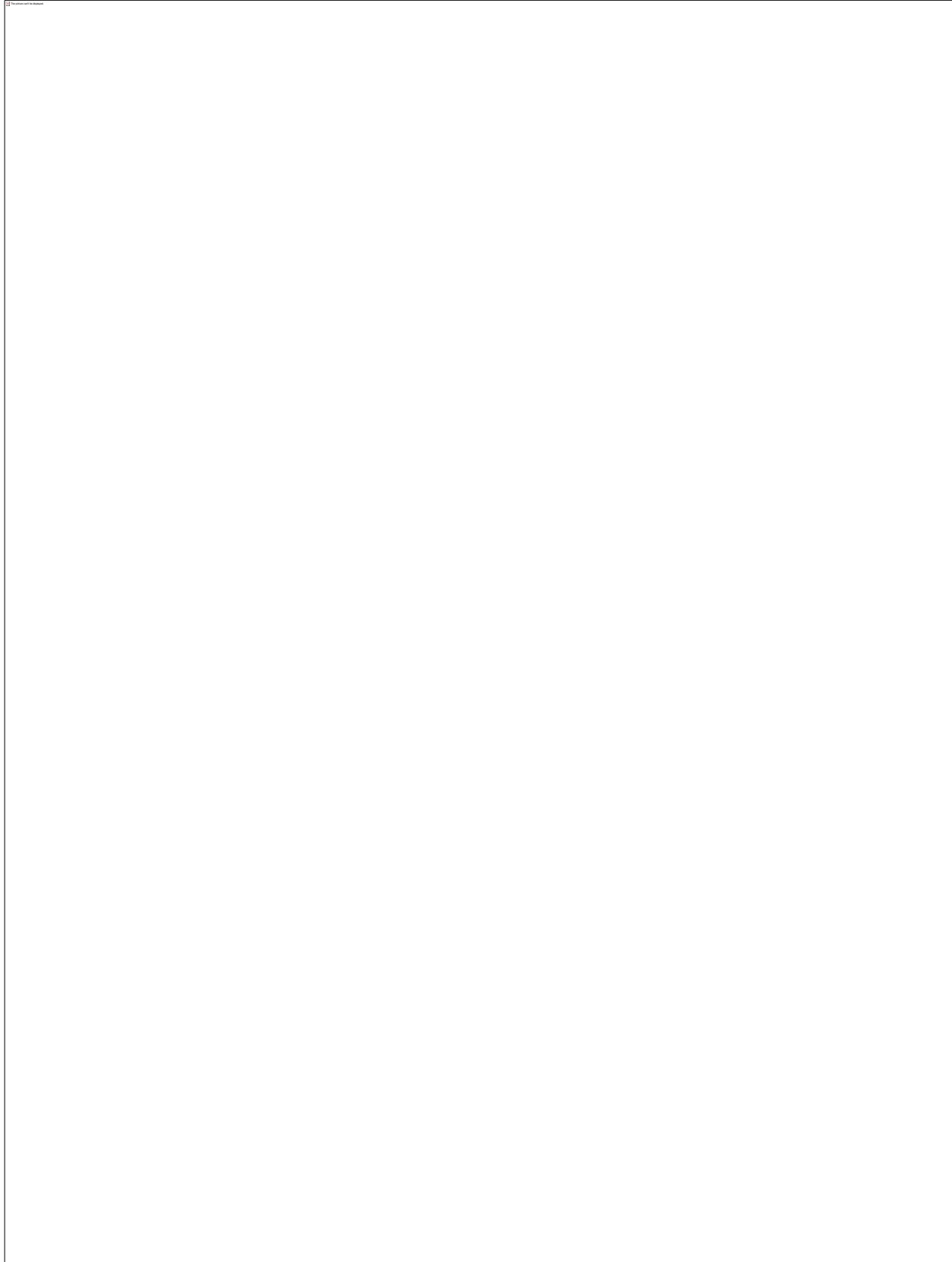
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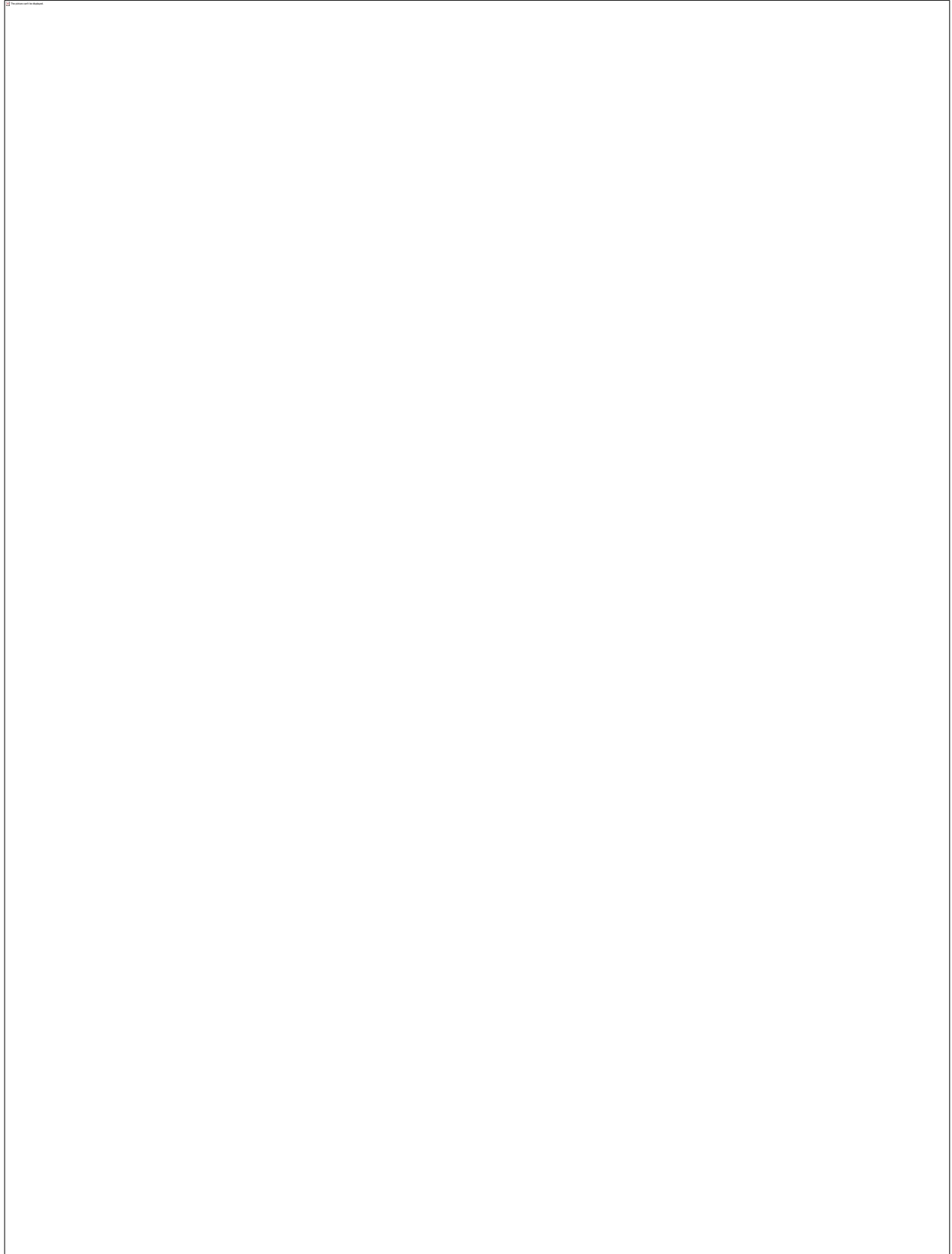
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joining the main stem. Areas in the County usually experiencing this are either located at the foothills or in low-lying areas of the Kootenai Valley where there is minimal topographic relief.

Libby is subject to periodic flooding caused by the overflow of Flower Creek. All types of structures, both residential and commercial, have encroached on the floodplain and are occasionally flooded as Flower Creek passes through the developed area. The backwater effects caused by the Kootenai River and the type and grouping of hydraulic structures on Flower Creek near the confluence contribute to the flooding of Flower Creek. The City of Libby is also susceptible to alluvial fan flooding due to the periodic overflow of Parmenter and Flower Creeks.

Bridges with piers in the channel collect debris and sediment and increase backwater, erosion, and overbank flooding. This is most pronounced on the lower reaches of Parmenter, Flower, and Libby creeks. Bridges are also subject to plugging from ice and debris due to a combination of seasonal conditions, high sediment and debris loads, poorly sized and aligned bridges and channel encroachments. These creeks have experienced significant overbank flooding, and channel/bank erosion and migration.

High sediment loads from active landslides, wildfire impact areas, tributaries, steeper upstream reaches, and historic activities and events contribute to widespread erosion, sedimentation, channel migration and overbank flooding.

Low-lying areas of the Town of Eureka are subject to periodic flooding caused by overflow of the Tobacco River. Occasionally, ice jams cause some overbank flooding. MHMP public meeting participants indicated that flooding is not a big problem in the Eureka area.

There is an increased risk of flooding after wildfire because the burned ground is unable to absorb the moisture, producing runoff conditions much like a parking lot. Because of this, even modest rainstorms or snowmelt over a burned area can result in increased stream discharge or flash flooding downstream. These floods are typically much larger for a given sized storm than they were before the wildfire, so flooding is likely to be much more extensive following wildfire, endangering properties previously considered safe from flooding. These floodwaters typically transport surface debris such as down trees, boulders, and gravel.

### Floodplain and Floodway Management

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DFIRMs are available for portions of Lincoln County. The maps distinguish floodplains, floodways and floodway fringes. The floodway is the highest risk area consisting of stream channels and banks where most damage and destruction occurs. Residential and commercial development, mobile homes and septic systems are prohibited in this area. The MHMP Planning Team indicated that light Detection and Ranging (LiDAR) mapping of creeks and rivers will take place in Lincoln County in the next few years.

The National Flood Insurance Program (NFIP) encourages local governments to adopt “sound” floodplain management programs to reduce private and public property losses due to floods. Lincoln County, the Cities of Libby and Troy, and the Town of Eureka participate in the NFIP. The Town of Rexford does not participate in the NFIP. **Table 4.4-2** presents statistics on flood insurance policies and losses.



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Table 4.4-2. National Flood Insurance Program Statistics (through 6/30/2018)

Jurisdictions	Policies in Force	Insurance in Force	Number of Losses	Total Payments
Lincoln County	76	\$17,223,300	29	\$321,833
City of Libby	15	\$5,956,600	8	\$95,089
City of Troy	0	0	1	\$23,572
Town of Eureka	2	\$95,800	0	\$0

Source: FEMA, 2018. <http://bsa.nfipstat.fema.gov/reports/1011.htm#MTT>;  
<http://bsa.nfipstat.fema.gov/reports/1040.htm#30>

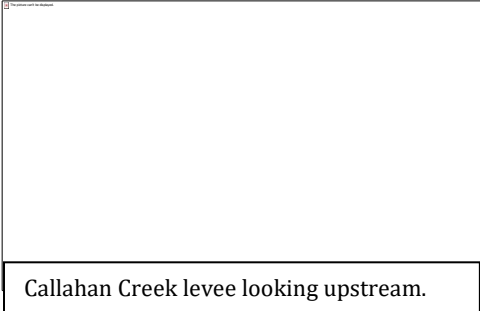
There are two repetitive loss properties in unincorporated portions of Lincoln County, each of which have had two losses for a total of \$58,275 (DES, 2018). A repetitive loss property is any insurable building for which two or more claims of more than \$1,000 were paid by the NFIP within any rolling ten-year period, since 1978. There are no severe repetitive loss properties in Lincoln County. Severe repetitive loss properties have had at least four NFIP claim payments over \$5,000 each and the cumulative amount exceeding \$20,000; or, where at least two separate claim payments have been made with the cumulative amount exceeding the market value of the building.

The NFIP’s Community Rating System (CRS) recognizes community efforts (beyond minimum standards) by reducing flood insurance premiums for the community’s property owners. CRS discounts on flood insurance premiums range from 5 percent up to 45 percent. Those discounts provide an incentive for new flood protection activities that can help save lives and property in the event of a flood. To participate in the CRS, a community can choose to undertake some of the 18 public information and floodplain management activities. Based on the total number of points a community earns, the CRS assigns you to one of ten classes. The discount on flood insurance premiums is based on your class. Neither Lincoln County nor the communities of Libby or Eureka participate in the CRS.

**Flood Protection Measures**

FEMA Flood Insurance Studies, completed for Lincoln County and the City of Libby (FEMA, 2006), and for the Town of Eureka (1979). These studies discuss the main drainages and outline flood protection measures where appropriate, as summarized below.

1. Bobtail Creek has no significant flood protection measures. However, some channel and bank reshaping occurred subsequent to the 1974 flood. In some areas along the creek, the channel rehabilitation work resulted in bank berms that previously did not exist and accommodate higher flow stages before overtopping.
2. Callahan Creek in Troy experienced channel reshaping after the 1974 event. An earthen and rock riprap dike was constructed upstream of the U.S. 2 bridge along the left bank looking downstream. The MHMP Planning Team indicated that the Callahan Creek levee system has been reinforced.
3. There is minimal to no flood protection along Flower Creek. Manmade rechannelization was performed subsequent to the January 1974 flooding.





## Section 4: Risk Assessment and Vulnerability Analysis

4. Libby Creek has only one flood protection measure, an earthen and rock riprap dike located along the left bank upstream of the bridge crossing SR 482. This dike was built or rebuilt following the January 1974 flood.
5. There is minimal to no flood protection work along the Tobacco River. Natural topographic features contain the flow on the north side, and both natural topographic features and a railroad embankment control flooding on the south side.
6. A FEMA-funded flood control and channel migration control project was completed on Parmenter Creek in 2000. The project includes a levee, two bridges, and several thousand feet of stream relocation and wetland construction.
7. Uncertified levees composed of nature materials dredged from Libby Creek line both banks from the Kootenai River past the former Stimson Timber millsite.
8. The Big Cherry/Granite Creek levee is located upstream of the U.S. 2 bridge, left bank. This levee is certified to provide protection from the 1 percent annual chance flood event and freeboard.

The three certified levees in Lincoln County will require recertification to maintain the discounted flood insurance rates offered to residents protected by these structures. The MHMP Planning Team indicated that two-thirds of the other creeks in the county are looking at new dikes and/or updating old dikes including Iron Creek in Troy.

### Probability and Magnitude

It is estimated that flooding causes 90 percent of all property losses from natural disasters in the United States and kill an average of 150 people a year nationwide. Most injuries and deaths occur when people are swept away by flood currents and most property damage results from inundation by sediment-laden water. Faster moving floodwater can wash buildings off their foundations and sweep vehicles downstream. Pipelines, bridges, and other infrastructure can be damaged when high water combines with flood debris. Basement flooding can cause extensive damage to the structure and systems of a building. The MHMP Planning Team indicated that there has also been economic impact in Lincoln County when roads have been closed due to flood damage.

Flood listings with associated property damage from the SHELDUS database and Montana DES are presented in **Table 4.4-3**.

**Table 4.4-3. Lincoln County Flood Events with Damages**

Date	Injuries	Fatalities	Property Damage	Crop Damage	Date	Injuries	Fatalities	Property Damage	Crop Damage
1969	0	0	\$5,841	\$0	1995	0	0	\$100	\$0
1974	0	0	\$2,478,430	\$0	1995	0	0	\$187,075	\$0
1986	0.03	0.03	\$29,338	\$0	1997	0	0	\$318,357	\$0
1989	0	0	\$2,463	\$2,463	1998	0	0	\$28,985	\$0
1989	0	0	\$328,459	\$0	2005	0	0	\$219,285	\$0
1990	0	0	\$23,372	\$0	2011	0	0	\$73,735	\$0
1991	0	0	\$112,139	\$0					
1991	0	0	\$641	\$0	<b>TOTAL</b>	<b>0.03</b>	<b>0.03</b>	<b>\$3,808,219</b>	<b>\$2,463</b>

Source: SHELDUS, 2017; DES, 2018.



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**Table 4.4-3. Lincoln County Flood Events with Damages**

Date	Injuries	Fatalities	Property Damage	Crop Damage	Date	Injuries	Fatalities	Property Damage	Crop Damage
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Note: Often casualties and damage information are listed without sufficient spatial reference. In order to assign the damage amount to a specific county, the fatalities, injuries and dollar losses were divided by the number of counties affected from this event.

The flood hazard impact map used for the MHMP analysis, as shown on **Figures 7,7A, 7B and 7C**, was a combination of available DFIRMs and a HAZUS model completed by FEMA in 2010. The HAZUS scenario was for a simulated 100-year flood using National Elevation Dataset, a flood frequency discharge table that references a specific discharge per return period for a given point (stream gage derived) and regression equations used between stream gage areas. The results of the vulnerability analysis are presented in **Table 4.4-4**.

**Table 4.4-4. Lincoln County Vulnerability Analysis – Flooding**

Category	Lincoln Co. (balance)	Libby (city)	Troy (city)	Eureka (town)
Residential Property Exposure \$	\$48,603,565	\$16,619,963	\$419,332	\$293,027
# Residences at Risk	444	165	5	4
Commercial & Industrial Property Exposure \$	\$10,601,524	\$5,624,551	\$86,669	\$0
# Commercial & Industrial Properties at Risk	58	25	1	0
Critical Facilities Exposure Risk \$	\$1,995,731	\$4,399,140	\$6,000,000	\$34,488
# Critical Facilities at Risk	5	4	1	1
Bridge Exposure \$	\$41,518,600	\$952,000	\$0	\$244,000
# Bridges at Risk	38	7	0	1
Persons at Risk	539	200	6	5
Persons Under 18 at Risk	180	67	2	2
Persons Over 65 at Risk	262	97	3	2

The GIS analysis indicates that about 41,913 acres in Lincoln County (1.8 percent) are located within the flood hazard area including 618 residences, 84 commercial and industrial buildings, and 11 critical facilities. The *Flood* section in **Appendix C** presents supporting documentation from the risk assessment including the critical facilities and bridges located in the 100-year flood hazard area.

Based on the frequency of past events, the probability of flooding in Lincoln County is rated as “highly likely”, an event that occurs every year.

The magnitude of flood damages in Lincoln County has been somewhat mitigated by the use of river gauges and proactive measures used to break up ice. During February 2017, the Flower Creek Task Force, made up of responders, elected officials, city/county employees, law enforcement officers, and contractors, met to discuss ice jam mitigation measures. These included releasing a minimal amount



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of warmer water from the Flower Creek Dam with the expectation of melting a channel in the ice, then slowly, breaking up and/or removing ice within the confines of Flower Creek. During the operation, equipment was staged at each bridge to watch for ice movement and ice removal. (The Western News, *Flower Creek Task Force Mobilizing*, February 13, 2017). The county has also shored up bridge embankments along Cherry, Granite, and Callahan Creeks to mitigate flood damage.

### Future Development

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Lincoln County adopted floodplain development regulations in 1991 that established a permitting system for development within the 100-year floodplains of local streams. The regulations provide guidance for development in flood-prone areas by restricting uses that are dangerous to public health, safety and property. Uses are delineated as to which uses are permitted, permitted conditionally or prohibited, as outlined in the current floodplain regulations.

The Lincoln County Subdivision Regulations state that land identified within the 100-year floodplain shall be subject to Lincoln County Floodplain Regulations as administered by the Lincoln County Floodplain Administrator. If any portion of a proposed subdivision is within 1,000 horizontal feet and 20 vertical feet of a live stream draining an area of 25 square miles or more, and no official floodway delineation or floodway studies of the stream have been made, the subdivider shall provide a floodplain analysis establishing the base flood elevations for the stream. The analysis must be performed by a professional engineer and reviewed and approved by the Floodplain Administrator in consultation with the Montana DNRC Regional Engineer.

The floodway fringe is a lower hazard area that would be inundated by a 100-year flood. Construction is allowed in the floodway fringe by special permit and must meet established regulations. The Lincoln County Health Department, which issues permits for all on-site sewage disposal systems, does not allow a system in or within 100 feet of a designated 100-year floodplain.

### Climate Change

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Many scientists agree that climate change will increase heavy rainfall and storms across the U.S., which will result in elevated water levels that may lead to a higher frequency of flooding. The Montana Climate Assessment (Whitlock et.al, 2017) provides a well-referenced discussion on the effects of climate change on flooding, as summarized below.

Across Montana, precipitation is projected to increase in winter, spring, and fall. The largest increases are expected to occur during spring in the southern part of the state. Warming will continue to reduce mountain snowpack, and this could reduce flood risk related to rain-on-snow events by reducing the quantity of water available for release stored as snow. Yet warming is also likely to increase the amount of winter and spring precipitation that falls as rain (particularly in rain-snow transition zones), which will accelerate snowmelt and could increase flood risk, depending on antecedent snowpack, soil moisture, and other conditions. As such, rising temperatures alone will influence flood risk, regardless of trends in precipitation; yet the effects will likely be location- and event-specific and therefore, difficult to predict.

Future precipitation projections show a general increase in extreme events at a global scale and regional climate models also consistently predict increases in extreme precipitation in the



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northwestern U.S. In Montana, the frequency of wet events (days with > 1 inch of rain) and variability in precipitation are both projected to increase slightly in western Montana by end-of-century.

There is considerable uncertainty surround future flood risk in response to climate change, and some research suggests that extreme precipitation events can actually intensify more quickly than what is projected by general circulation models. Additionally, flood risk depends on specific storm characteristics that are difficult to capture in most models. Moreover, the particular effects of projected changes in temperature and precipitation on flood risk will depend on location, elevation, and antecedent weather conditions, as well as human practices (Whitlock et.al, 2017).

Population, property, and critical facility flood exposure may increase as a result of climate change. Runoff patterns may change resulting in flooding in areas where it has not previously occurred with an increased risk to facilities that have not historically flooded.

The significance of increased flooding is great. Besides impacting communities, destroying homes, and causing deaths, floods can cause drinking water to become contaminated, Floods can also cause hazards such as disease-carrying animals and spills of chemicals or other hazardous materials. Overall, if flooding is to increase from climate change it will also pose risks to people's health and to entire communities.



## 4.5 Disease

CPRI SCORE =2.9

### Description and History

Infectious diseases, sometimes called communicable 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) either by: one infected person to another, from an animal to a human, from an animal to an animal, or from some inanimate object (doorknobs, table tops, etc.) to an individual. A pandemic is a global disease outbreak. Human diseases, particularly epidemics, are possible throughout the nation and Lincoln County is not immune to this hazard. In addition, livestock and animal disease could have a devastating effect on the economy and food supply in Lincoln County and beyond. Highly contagious diseases are the most threatening to both populations.

Communicable disease or biological agents could be devastating to the population or economy of Lincoln County. Human diseases when on an epidemic scale, can lead to high infection rates in the population causing isolation, quarantines and potential mass fatalities. Diseases that have been eliminated from the U.S. population, such as smallpox, could be used in bioterrorism.

The following list gives examples of biological agents or diseases that could occur naturally or be used by terrorists as identified by the Centers for Disease Control and Prevention (2017).

#### Category A

Definition - The U.S. public health system and primary healthcare providers must be prepared to address various biological agents, including pathogens that are rarely seen in the United States. High-priority agents include organisms that pose a risk to national security because they:

1. Can be easily disseminated or transmitted from person to person;
2. Result in high mortality rates and have the potential for major public health impact;
3. Might cause public panic and social disruption; and
4. Require special action for public health preparedness.

Agents/Diseases:

1. Anthrax (*Bacillus anthracis*)
2. Botulism (*Clostridium botulinum* toxin)
3. Plague (*Yersinia pestis*)
4. Smallpox (*variola major*)
5. Tularemia (*Francisella tularensis*)
6. Viral hemorrhagic fevers (filoviruses [e.g., Ebola, Marburg] and arenaviruses [e.g., Lassa, Machupo])

#### Category B

Definition - Second highest priority agents include those that:

1. Are moderately easy to disseminate;
2. Result in moderate morbidity rates and low mortality rates; and



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3. Require specific enhancements of CDC's diagnostic capacity and enhanced disease surveillance.

### Agents/Diseases:

1. Brucellosis (*Brucella* species)
2. Epsilon toxin of *Clostridium perfringens*
3. Food safety threats (e.g., *Salmonella* species, *Escherichia coli* O157:H7, *Shigella*)
4. Glanders (*Burkholderia mallei*)
5. Melioidosis (*Burkholderia pseudomallei*)
6. Psittacosis (*Chlamydia psittaci*)
7. Q fever (*Coxiella burnetii*)
8. Ricin toxin from *Ricinus communis* (castor beans)
9. Staphylococcal enterotoxin B
10. Typhus fever (*Rickettsia prowazekii*)
11. Viral encephalitis (alphaviruses [e.g., Venezuelan equine encephalitis, eastern equine encephalitis, western equine encephalitis])
12. Water safety threats (e.g., *Vibrio cholerae*, *Cryptosporidium parvum*)

### Category C

Definition - Third highest priority agents include emerging pathogens that could be engineered for mass dissemination in the future because of:

1. Availability;
1. Ease of production and dissemination; and
2. Potential for high morbidity and mortality rates and major health impact.

### Agents:

1. Emerging infectious diseases such as Nipah virus and hantavirus

These diseases/bioterrorism agents can infect populations rapidly, particularly through groups of people in close proximity such as schools, assisted living facilities, and workplaces.

Historically, the Spanish influenza outbreak after World War I in 1918-1919 caused 9.9 deaths per 1,000 people in the State of Montana (Brainerd and Siegler, 2002). Historical records from newspapers show that the influenza outbreak was so bad in 1918 that residents were quarantined from November 30 to December 17 after 18 people died and 53 new cases were discovered.

Influenza is a highly contagious viral infection of the nose, throat, and lungs that occurs most often in the late fall, winter, and early spring. It is a serious infection that affects between 5-20 percent of the U.S. population annually. Each year, more than 200,000 individuals are hospitalized and 3,000-49,000 deaths occur from influenza-related complications (IDSA, 2016). The Montana Dept. of Public Health and Human Services (DPHHS), maintains statistics of influenza cases in Montana counties. Recent data for Lincoln County is summarized below.

2. 2013-2014 season: 34 influenza cases (1 hospitalization/no fatalities) in Lincoln County with 8 fatalities across the State.



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3. 2014-2015 season: 203 influenza cases (8 hospitalizations/no fatalities) in Lincoln County with 24 fatalities across the State.
4. 2015-2016 season: 62 influenza cases (no hospitalization/no fatalities) in Lincoln County with 33 fatalities across the State.
5. 2016-2017 season: 90 influenza cases (7 hospitalizations/no fatalities) in Lincoln County with 56 fatalities across the State.
6. 2017-2018 season: 167 influenza cases (13 hospitalizations/no fatalities) in Lincoln County with 79 fatalities across the State.

The Montana DPHHS manages a database of reportable communicable disease occurrences. A summary for Lincoln County for the years 2007 to 2016 is presented in **Table 4.5-1**.

**Table 4.5-1. Lincoln County Communicable Disease Summary; 2007 - 2016**

Disease	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
<b>Vaccine Preventable Diseases</b>										
Hepatitis C, acute	-	1	-	3	7	1	2	-	-	-
Hepatitis C, chronic	-	-	-	-	-	25	22	45	32	37
Meningitis, Viral	1	-	-	-	-	-	-	-	-	-
Pertussis	-	-	-	4	-	9	16	55	6	-
Strep Pneumonia	2	2	1	2	2	1	1	-	1	-
Tuberculosis	1	-	-	-	-	-	1	-	-	-
Varicella	7	23	3	11	37	7	1	1	4	-
<b>Enteric Diseases</b>										
Campylobacteriosis	1	1	-	11	9	14	11	2	6	10
Cryptosporidiosis	2	1	1	4	5	2	1	1	-	2
Giardia	4	3	-	3	-	-	-	1	-	2
Salmonella	5	1	2	1	1	2	-	-	1	1
Shiga-toxin <i>E. coli</i>	-	-	-	2	-	-	-	3	1	-
<b>Other Communicable Diseases</b>										
Legionellosis	-	-	-	-	-	-	-	1	-	-
Shigellosis	-	-	-	-	-	-	2	-	1	-
Rabies	-	1	1	-	1	1	2	3	3	1
STDs	62	34	22	34	34	56	38	29	43	61
Tick Fever, Lyme	1	-	-	-	1	-	-	-	-	2

Source: Montana DPHHS Communicable Disease Summaries, 2007 – 2016; Notes: STD = Sexually Transmitted Disease

Norovirus is the leading cause of illness and outbreaks from contaminated food in the United States. Most outbreaks happen when infected people spread the virus to others. Health care facilities, including nursing homes and hospitals, are the most commonly reported settings for norovirus outbreaks.

In addition to infectious disease, the Libby community and its residents have been facing a critical public health crisis caused by the slow-motion disaster of asbestos exposure. There have been hundreds of illnesses and deaths in the Libby community over the past 70 years resulting from occupational and non-occupational environmental exposures to asbestos associated with Libby's vermiculite mining and milling operations. Six miles north of Libby, vermiculite was mined by the



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Zonolite Corporation from 1919-1963 and then by W.R. Grace from 1963 until the mine closure in 1990. The vermiculite contained a naturally occurring amphibole asbestos mixture which is particularly toxic to human beings. The contamination was not limited just to the mine site; Libby residents were able to pick up free truckloads of asbestos-contaminated vermiculite for use at home. The vermiculite was used to pave driveways and in public areas (boat ramps, ice rink, running track, baseball fields and school yards). Children played in piles of vermiculite that could be found throughout the community. Also, attic insulation contaminated with Libby asbestos may still be in schools, businesses and as many as 35 mission homes around the U.S. (U.S. EPA, 2015).

The vermiculite mining operation was finally closed in 1990. In 1999, the U.S. EPA sent an Emergency Response Team to Libby as a response to local health concerns and related national news articles about asbestos-contaminated vermiculite. The EPA assessed the risk to public health and then began taking actions to reduce the risk. In 2002, the EPA added Libby Asbestos to the National Priorities List as a superfund cleanup site. In 2009, the EPA declared Libby's asbestos problem to be a public health emergency.

The Lincoln County Public Health Dept. operates the Asbestos Resource Program, which is dedicated to keeping families and workers safe from asbestos exposure. More information is available at: <http://www.lcarp.org/index.php/education/vermiculite-libby>

### **Vulnerability and Area of Impact**

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Diseases threaten the population, plants, and animals of Lincoln County as opposed to structures. The entire population is at risk for contracting disease. The more urban nature of Libby makes it more vulnerable to rapidly spreading and highly contagious diseases compared to other more rural parts of the county. In addition, tourist visits in the county could introduce a disease to the local population. The number of fatalities in the county would depend on the mortality (disease/agent attack) rate and the percentage of the population affected. The ability to control the spread of disease will be dependent on the contagiousness of the disease and movement of the population. Given the uncertain nature of diseases, Lincoln County is assumed to have the same infectious disease risk county-wide.

Exposure associated with the Libby Asbestos Site did not only affected miners, mill-workers, and family members but also other local residents, including children. It was disclosed that not only was ambient air contaminated which exposed the entire community, but disturbance of contaminated source materials through common activities resulted in exposure to breathable asbestos fibers in the air. Contamination of private properties included the insulation in attics and walls of homes and businesses, and contaminated soil in gardens, yards, driveways, and sandboxes.

W.R. Grace closed the mine in 1990 and cleanup efforts in Libby began in 1999. Some 8,100 properties were checked for asbestos in Libby and Troy. Of those, 2,600 required cleanups. Some cleanups involved excavating gardens and yards. Some involved cleaning asbestos insulation from attics and walls. In September 2018, it was estimated that only a handful of properties remained to be examined and just a couple of cleanups were still in process. The government so far has spent \$540 million removing more than a million cubic yards of dirt and contaminated building materials from more than 2,000 properties in Libby and Troy. There are 230 properties where owners have not allowed the EPA on the property to check for contamination. Agency official have never fully





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documented how many homes and businesses were left with vermiculite in walls after cleanup work was completed.

The proposal for Libby and Troy calls for asbestos-containing vermiculite to be left in place where the EPA says it presents minimal risk and can be safely managed. There is concern however, that asbestos inevitably will escape during future excavation work, home renovations and accidents such as fires. The agency's proposal includes a number of "institutional controls" to manage the remaining asbestos. They include zoning restrictions that outline which activities are allowed on contaminated property; permit requirements for the disturbance of contaminated soil or building materials; and advisories for firefighters and others who might inadvertently encounter asbestos on the job. (Daily Inter Lake, *Final EPA Plan Would Leave Some Asbestos in Libby*, May 5, 2015; Independent Record, *As Libby Asbestos Cleanup Gets Done, the Dying Continues*, October 4, 2018)

### Probability and Magnitude

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Individual infectious diseases will likely be reported on an annual basis giving this hazard a probability rating of "highly likely". The entire project area has been classified with a uniform risk for the disease hazard.

The magnitude of an infectious disease outbreak varies from common viral outbreaks to widespread bacterial infection. During the 1918 influenza pandemic, infection rates approached 28 percent in the United States (Billings, 1997). Other pandemics produced infection rates as high as 35 percent of the total population (World Health Organization, 2009). Such a pandemic affecting Lincoln County represents a severe magnitude event. 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.

While the U.S. saw an Ebola outbreak in 2014, news of an Ebola virus for the state of Montana was minimal. Montana DPHHS said the likelihood of Ebola showing up in Montana is small.

Montana's local and state public health officials are monitoring developments regarding Zika virus closely. At this time, the impact of Zika in Montana will likely be confined to individuals returning from or planning travel to Zika-affected areas and Montana's mosquitoes are not expected to be able to transmit the virus.

Past asbestos exposures left Libby and Troy residents with a complex array of healthcare and associated problems. Health workers have estimated as many as 400 people have died and more than 2,400 have been diagnosed with asbestos-related disease. Due to the latency period of asbestos-related disease, there will be a steady stream of the sick and the dying. It can take 40 years or more after exposure for symptoms of the disease to develop, which means that another generation or two will be affected by the disease. A comprehensive exposure questionnaire is utilized by the Center for Asbestos-Related Disease (CARD) healthcare providers to assess an individual's exposure pathways to identify the potential risk of developing Libby amphibole asbestos diseases.

### Future Development

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There are no land use regulations for future development that could impact the communicable disease hazard. New residents and population add to the number of people threatened in the county, but the location of such population increases would not increase their vulnerability to the hazard.



**Climate Change**

The effects of climate change on the disease hazard is mainly to the population. Outbreaks of insect- and water-borne infection associated with higher temperatures could increase population exposure; especially vulnerable would be the young and elderly. With higher temperatures, harmful algal blooms are more apt to form on lakes which could expose swimmers to cyanobacteria known to cause Alzheimer's, ALS, and other neurological diseases. Property and critical facilities are not expected to have an increase in disease exposure or vulnerability due to the effects of climate change.

Although some evidence indicates that warming may be causing infectious disease to spread, predicting how climate change will ultimately influence the incidence of diseases transmitted by insects remains challenging. More predictable as climate change unfolds is the spread of waterborne infections. These infections most often cause diarrheal illness and flourish in the wake of heavy rainfalls as runoff from land enters into and may contaminate water supplies. Many pathogens that cause diarrheal disease reproduce more quickly in warmer conditions as well (Harvard School of Public Health, 2016).

Awareness has been growing in recent years about zoonotic diseases— that is, diseases that are transmissible between animals and humans, such as Lyme disease and West Nile virus. The rise of such diseases results from closer relationships among wildlife, domestic animals, and people, allowing more contact with diseased animals, organisms that carry and transmit a disease from one animal to another (vectors), and people. Disease vectors include insects, such as mosquitoes, and arachnids, such as ticks. Thus, it is impossible to separate the effects of global warming on wildlife from its effects on the health of domestic animals or people (USGS, 2012).



## 4.6 Workplace Violence/Active Shooter

CPRI SCORE = 3.15

### Description and History

Workplace violence is any act or threat of physical violence, harassment, intimidation, or other threatening disruptive behavior that occurs at the work site. It ranges from threats and verbal abuse to physical assaults and even homicide. It can affect and involve employees, clients, customers and visitors. Homicide is currently the fourth-leading cause of fatal occupational injuries in the United States. According to the Bureau of Labor Statistics Census of Fatal Occupational Injuries, of the 4,679 fatal workplace injuries that occurred in the United States in 2014, 403 were workplace homicides. However, it manifests itself, workplace violence is a major concern for employers and employees nationwide (OSHA, 2018). There are three major types of workplace violence.

1. Type I involves a violent act by an assailant with no legitimate relationship to the workplace who enters the workplace to commit a robbery or other criminal act.
2. Type II involves a violent act or threat of violence by a recipient of a service provided by the University, such as a client, patient, customer, passenger or criminal suspect or prisoner.
3. Type III involves a violent act or threat of violence by a current or former employee, supervisor, manager, or another person who has some employment related involvement such as an employee's spouse or lover, an employee's relative or friend, or another person who has a dispute with one of our employees. This is the most common threat.

Lone gunman shootings (active shooters) are another form of terrorism. In the U.S., lone gunman shootings have occurred at schools, movie theaters, and other locations. Most lone gunman shootings occur where a specific place was deliberately selected as the location for the attack and was not simply a random site of opportunity. These shootings have sparked a political debate over gun violence, whether firearms should be allowed in the classroom and whether there should be stricter gun control.

An active shooter/ hostile intruder is an individual actively engaged in killing or attempting to kill people in a confined and populated area by any means including but not limited to firearms (most frequently used), bladed weapons, vehicles, or any tool that in the circumstance in which it is used constitutes deadly physical force. In most cases, there is no pattern or method to their selection of victims. Most active shooter situations are unpredictable, evolve quickly, and are over within minutes. There have been no active shooter incidents in Lincoln County.

### Vulnerability and Area of Impact

Nearly 2 million American workers report having been victims of workplace violence each year. Unfortunately, many more cases go unreported. Research has identified factors that may increase the risk of violence for some workers at certain worksites. Such factors include exchanging money with the public and working with volatile, unstable people. Working alone or in isolated areas may also contribute to the potential for violence. Providing services and care, and working where alcohol is served may also impact the likelihood of violence. Additionally, time of day and location of work are also risk factors that should be considered when addressing issues of workplace violence. Among those with higher-risk are workers who exchange money with the public, delivery drivers, healthcare



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professionals, public service workers, customer service agents, law enforcement personnel, and those who work alone or in small groups (OSHA, 2018).

MHMP Planning Team members indicated that workplace violence threats aren't common; however, the opioid crisis has caused patients to threaten doctors for prescriptions in Lincoln County. Northwest Montana has a number of small isolated communities where anti-government sentiments are high. These individuals may be more susceptible to carrying out illegal or harmful acts to justify their beliefs.

### **Probability and Magnitude**

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The probability of a workplace violence/active shooter incident in Lincoln County is difficult to determine. As with any area, a shooting by a disgruntled person, employee, or student is always possible.

The workplace violence /active shooter hazard is considered an emerging hazard with little to no history in the region but incidents occurring with more frequency across the nation. As such, the probability of a future incident in Lincoln County was rated by the Planning Team as "highly likely". The entire project area has been classified with a uniform risk for workplace violence / active shooter incidents.

### **Future Development**

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Future development should have little to no impact on the threat of workplace violence / active shooter incidents in Lincoln County.

### **Climate Change**

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Climate change is a global challenge which is likely to affect the mankind in substantial ways. Not only is climate change expected to affect physical health, it is also likely to affect mental health. Increasing ambient temperatures is likely to increase rates of aggression and violent suicides; however, there is no correlation between climate change and an increase in workplace violence or active shooter incidents.



## 4.7 Severe Weather

CPRI SCORES:

Severe Summer Weather = 2.45

### Description and History

Severe weather hazards have become more significant in recent years due to climate change. Natural resource trends indicate the mean annual precipitation has been below average and the mean annual temperatures have been above average for the past five years. Severe storms are not common; however, thunderstorms, hailstorms, high winds, heavy snow, freezing rain and sleet do occur. Available wind information indicates wind gusts in excess of 60 mph are not uncommon. The trend of variable weather conditions is expected to continue.

The winter weather hazard includes several weather conditions that occur from late fall through early spring in Lincoln County (typically November through April). Snow, blizzards, extended cold and high winds frequently occur together but also occur independent of one another during these months. Severe summer weather includes thunderstorms, wind, hail, lightning, tornadoes, and microbursts that typically occur between May and October of each year.

### Severe Winter Weather

Winter storms and blizzards follow a seasonal pattern that begins in late fall and lasts until early spring. These storms have the potential to destroy property and cause human fatality or injury. 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.

A severe winter storm is generally a prolonged event involving snow or ice and extreme cold. The characteristics of severe winter storms are determined by the amount and extent of snow or ice, air temperature, wind speed, and event duration. Severe winter storms create conditions that disrupt essential regional systems such as public utilities, telecommunications, and transportation routes.

A combination of below zero temperatures, heavy snow, and high winds can close roads, threaten disruption of utilities, limit access to rural homes, impede emergency services delivery and close businesses. Such storms also create hazardous travel conditions, which can lead to increased vehicular accidents and threaten air traffic. Additionally, motorists stranded due to closed roads and highways may present a shelter problem.

Avalanches do not impact Lincoln County communities as most homes are located away from steep slopes. The biggest avalanche threat is to recreationists who backcountry ski or snowmobile within the national forest. There was a fatality in the west Cabinet mountains near Troy in 2013 when a snowmobiler was caught in an avalanche.

The National Weather Service provides short-term forecasts of hazardous weather to the public by producing regularly-scheduled severe weather outlooks and updates on various forms of hazardous weather including blizzards and wind chill. Warning and Advisory Criteria for winter weather is presented in **Table 4.7-1**.



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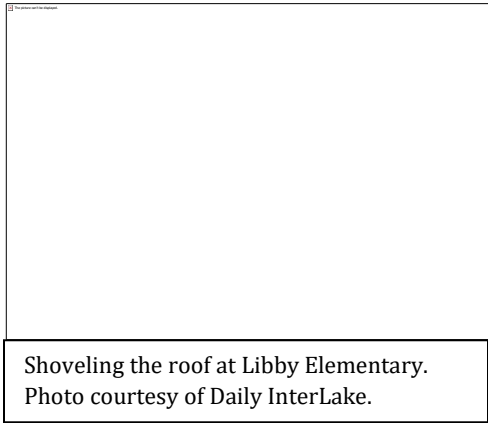
**Table 4.7-1. Warning and Advisory Criteria for Severe Winter Weather**

Winter Weather	Weather Advisory
Winter Storm Watch	Issued to give the public 12-48 hours of advance notice of the potential for snow 6 inches or more in 12 hours or 8 inches or more in 24 hours AND sustained or frequent wind gusts of 25 – 34 mph occasionally reducing visibilities to ¼ mile or less for three hours or more.
Winter Weather Advisory	Issued when a combination of winter weather elements that may cause significant inconveniences are occurring, imminent, or have a high probability of occurring.
Winter Storm Warning	Issued when snow 6 inches or more in 12 hours or 8 inches or more in 24 hours AND sustained or frequent wind gusts of 25-34 mph occasionally reducing visibilities to ¼ mile or less for three hours or more are occurring, imminent, or have a high probability of occurring.
Blizzard Watch	Issued to give the public 12-48 hours of advance notice of possible blizzard conditions (sustained winds or frequent gusts of 35 mph or greater and visibilities of less than a quarter mile from falling and/or blowing snow for 3 hours or more).
Blowing Snow Advisory	Issued for visibilities intermittently at or below ½ mile because of blowing snow.
Blizzard Warning	Issued when blizzard conditions (sustained winds or frequent gusts of 35mph or greater and visibilities of less than a quarter mile from falling and/or blowing snow for 3 hours or more) are occurring, imminent, or have a high probability of occurring.
Freezing Rain Advisory	Issued when an accumulation of ice will make roads and sidewalks slippery, but significant and damaging accumulations of ice are not expected.
Ice Storm Warning	Issued when a significant and damaging accumulation of ice is occurring, imminent or has a high probability of occurring.
Snow Advisory	Issued when snow accumulations of 2-5 inches in 12 hours are expected.
Sleet Advisory	Issued when sleet accumulations causing hazardous conditions are expected.
Heavy Snow Warning	Issued when snow accumulations of 6 inches or more in 12 hours or 8 inches or more in 24 hours are expected.
Wind Chill Watch	Issued to give the public 12-48 hours advanced notice of the potential for wind chills of -40°F or colder with a wind speed of 10 mph or higher and a duration of 6 hours or more.
Wind Chill Advisory	Issued when wind chills of -20°F to -39°F with a wind speed of 10 mph or higher and a duration of 6 hours or more are expected.
Wind Chill Warning	Issued when wind chills of -40°F or colder with a wind 10 mph wind in combination with precipitation.

Source: National Weather Service (NWS, 2018)

Lincoln County MHMP Planning Team members stated that recent winters have had more snowfall and structural damage from heavy snow loads has become more common. The winter of 2016/2017 was particularly bad, and many roofs were lost or damaged. A State of Emergency was declared, as described below.

February 10, 2017 – A State of Emergency was declared in Lincoln County in response to a series of winter storms that dumped record amounts of snow over portions of northwest Montana. Nearly 4 feet of snow piled up causing a portion of a roof to collapse at Troy’s Bull Lake Fire District station. Some Troy residents were without power for nearly 24 hours following the storm. There was so much snow that there was no place left to put it. Continued low temperatures in Eureka delayed school schedules and forced bus operations to shut down. The NWS reported that from February 3-6, Lincoln County received 28-33 inches of snow and Libby received 36-41 inches. (Daily Inter Lake, *State of Disaster Declared in Lincoln, Glacier County*, February 10, 2017)



Snow storms and low temperatures are common during winter in Lincoln County and residents are generally prepared for it. Sometimes, blizzards can occur and overwhelm the ability to keep roads



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passable. Heavy snow events also have the potential to bring down power lines and trees and cause structural damage. Lincoln County MHMP Planning Team members indicated that isolation and power interruption are major concerns during severe winter weather. Table 4.7-2 presents the severe winter weather events in Lincoln County since 2000 from the National Climatic Data Center.

**Table 4.7-2. Lincoln County Severe Winter Weather Reports (~November-April)**

Date	Event	Date	Event	Date	Event
1/1/2000	Heavy Snow	1/17/2005	Winter Storm	12/16/2012	Heavy Snow
1/3/2000	Heavy Snow	12/1/2005	Winter Storm	12/17/2012	Heavy Snow
1/13/2000	Heavy Snow	12/4/2005	Winter Storm	12/19/2012	Heavy Snow
2/1/2000	Heavy Snow	12/21/2005	Winter Weather	11/2/2013	Winter Weather
3/14/2000	Heavy Snow	1/9/2006	Winter Storm	11/5/2013	Winter Weather
3/28/2000	Heavy Snow	1/29/2006	Heavy Snow	11/7/2013	Winter Weather
11/8/2000	Heavy Snow	3/8/2006	Winter Storm	11/10/2013	Winter Weather
11/29/2000	Heavy Snow	11/10/2006	Heavy Snow	11/15/2013	Heavy Snow
12/14/2000	Winter Storm	11/12/2006	Heavy Snow	11/29/2013	Winter Weather
12/16/2000	Heavy Snow	11/23/2006	Winter Storm	12/1/2013	Winter Weather
12/26/2000	Heavy Snow	11/26/2006	Winter Storm	12/2/2013	Winter Storm
2/4/2001	Heavy Snow	12/15/2006	Winter Storm	12/6/2013	Extreme Cold/Wind Chill
2/15/2001	Winter Storm	1/5/2007	Winter Storm	12/9/2013	Winter Weather
4/2/2001	Heavy Snow	11/26/2007	Heavy Snow	12/18/2013	Winter Weather
4/7/2001	Heavy Snow	12/2/2007	Winter Storm	12/20/2013	Winter Weather
10/11/2001	Heavy Snow	12/29/2007	Heavy Snow	1/2/2014	Winter Weather
10/23/2001	Heavy Snow	1/19/2008	Winter Storm	1/7/2014	Winter Weather
11/28/2001	Heavy Snow	1/26/2008	Heavy Snow	1/11/2014	Winter Weather
12/1/2001	Heavy Snow	1/31/2008	Heavy Snow	1/29/2014	Winter Weather
12/12/2001	Heavy Snow	2/7/2008	Heavy Snow	2/5/2014	Extreme Cold/Wind Chill
12/15/2001	Heavy Snow	3/28/2008	Heavy Snow	2/12/2014	Winter Weather
1/18/2002	Heavy Snow	6/10/2008	Heavy Snow	2/14/2014	Winter Weather
1/24/2002	Heavy Snow	12/12/2008	Winter Storm	2/17/2014	Winter Weather
3/5/2002	Heavy Snow	12/17/2008	Heavy Snow	2/20/2014	Winter Weather
3/11/2002	Heavy Snow	12/24/2008	Heavy Snow	2/22/2014	Avalanche
3/18/2002	Heavy Snow	12/27/2008	Heavy Snow	2/27/2014	Winter Weather
3/20/2002	Blizzard	12/29/2008	Heavy Snow	3/1/2014	Extreme Cold/Wind Chill
4/14/2002	High Wind	1/1/2009	Winter Storm	3/2/2014	Heavy Snow
5/21/2002	Heavy Snow	1/6/2009	Heavy Snow	6/17/2014	Winter Weather
6/8/2002	Heavy Snow	2/26/2009	Heavy Snow	11/21/2014	Ice Storm
11/9/2002	Winter Storm	3/5/2009	Heavy Snow	12/27/2014	Winter Storm
12/26/2002	Winter Storm	4/28/2009	High Wind	1/5/2015	Heavy Snow
12/28/2002	Heavy Snow	11/7/2009	Winter Storm	11/17/2015	High Wind
12/30/2002	Heavy Snow	4/8/2010	High Wind	11/24/2015	Winter Storm
1/22/2003	Heavy Snow	12/27/2010	Heavy Snow	12/3/2015	Ice Storm
2/16/2003	Winter Storm	1/12/2011	Heavy Snow	12/21/2015	Heavy Snow
3/5/2003	Winter Storm	1/29/2011	Heavy Snow	12/3/2016	Winter Storm
3/8/2003	Heavy Snow	2/12/2011	High Wind	1/1/2017	Winter Storm
11/16/2003	Winter Storm	2/12/2011	High Wind	1/7/2017	Heavy Snow
11/23/2003	Winter Storm	2/12/2011	High Wind	1/18/2017	Winter Storm
11/28/2003	Winter Storm	2/22/2011	Heavy Snow	2/3/2017	Heavy Snow
12/13/2003	Heavy Snow	11/14/2011	Heavy Snow	2/5/2017	Winter Storm
1/1/2004	Winter Storm	11/17/2011	Heavy Snow	2/8/2017	Winter Storm
1/5/2004	Cold/Wind Chill	11/18/2011	Heavy Snow	3/9/2017	Winter Weather
1/26/2004	Winter Storm	3/13/2012	High Wind	11/2/2017	Heavy Snow



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**Table 4.7-2. Lincoln County Severe Winter Weather Reports (~November-April)**

Date	Event	Date	Event	Date	Event
3/5/2004	Winter Storm	3/21/2012	Heavy Snow	12/19/2017	Heavy Snow
12/7/2004	Winter Storm	10/23/2012	Heavy Snow	1/6/2018	Winter Weather
12/14/2004	Winter Weather	11/8/2012	Heavy Snow	1/11/2018	Winter Weather
1/7/2005	Winter Storm	12/6/2012	Heavy Snow	2/17/2018	Winter Storm
1/11/2005	Winter Storm			4/1/2018	Heavy Snow

Source: NCDC, 2018

### Severe Summer Weather

A severe thunderstorm is defined by the NWS as a thunderstorm that produces wind gusts at or greater than 58 mph (50 knots), hail 1-inch or larger, and/or tornadoes. Although not considered “severe”, lightning and heavy rain can also accompany thunderstorms. Thunderstorms can produce intense downburst and microburst wind. In addition, strong winds, defined below, can occur outside of thunderstorms when the overall weather conditions are favorable.

Tornadoes are the most concentrated and violent storms produced by the earth’s atmosphere. They are created by a vortex of rotating wind and strong vertical motion, which possess remarkable strength and can cause widespread damage. The most violent tornadoes are capable of tremendous destruction with wind speeds of 300 mph or more. Maximum wind speeds in tornadoes are confined to small areas and vary over short distances. Tornadoes are most common in the Great Plains and have occurred in eastern Montana. Thunderstorms can produce deadly and damaging tornadoes.

The NWS provides short-term forecasts and warnings of severe summer weather to the public by producing regularly-scheduled severe weather outlooks and updates on various forms of hazardous weather including tornado warnings, as shown in **Table 4.7-3**.

**Table 4.7-3. Warning and Advisory Criteria for Severe Summer Weather**

Summer Weather	Weather Advisory
Hazardous Weather Outlook	Hazardous weather outlooks alert the public to the possibility for severe weather in the area from one to seven days in advance.
Severe Thunderstorm Watch	Issued when conditions for severe thunderstorms appear favorable for an area over the next several hours. Watches are typically in effect for 4-6 hours.
Severe Thunderstorm Warning	Issued when Doppler radar indicates or the public reports a thunderstorm with wind gusts of 58 mph or greater and/or hail 1-inch or larger in diameter. The warning is usually valid for 30-60 minutes.
High Wind Watch	Issued when conditions are favorable for non-thunderstorm sustained winds of 40 mph or greater or gusts of 58 mph or greater for a period of one hour or more, but the timing, location, and/or magnitude are still uncertain.
High Wind Warning	Issued when non-thunderstorm sustained winds of 40 mph or greater or gusts of 58 mph or greater for a period of one hour or more are expected.
Tornado Watch	Issued when conditions for tornadoes appear especially favorable for an area over the next several hours. Watches are typically in effect for 4-6 hours.
Tornado Warning	Issued when Doppler radar indicates or the public reports a tornado. The warning is usually valid for 15-45 minutes.

Source: NWS, 2018.

Since the 2011 Lincoln County PDM Plan was completed, numerous incidents of severe summer weather have affected the county. MHMP Planning Team members recalled a wind event or microburst in the Yaak during July 2016 and a wind event in October 2017 that blew the roof off the West Kootenai Amish School. **Table 4.7-4** presents severe summer storm events from the National Climatic Data Center indicating the magnitude of these events.





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**Table 4.7-4. Lincoln County Severe Summer Weather Reports (~May-October)**

Date	Event	Magnitude	Date	Event	Magnitude
6/1/2001	Tstorm Wind	52 knots	8/5/2009	Hail	1.75 inch
5/19/2002	Tstorm Wind	55 knots	5/3/2010	High Wind	55 knots
5/22/2006	Hail	1 inch	7/12/2011	Heavy Rain	-
7/6/2006	Tstorm Wind	70 knots	10/6/2011	Heavy Rain	-
7/10/2006	Hail	0.75 inch	10/15/2012	Heavy Rain	-
8/10/2006	Tstorm Wind	60 knots	7/17/2013	Hail	1.25 inch
6/5/2007	Tstorm Wind	50 knots	7/17/2013	Tstorm Wind	75 knots
6/29/2007	Tstorm Wind	65 knots	3/4/2014	Heavy Rain	-
7/18/2007	Tstorm Wind	61 knots	7/23/2014	Tstorm Wind	52 knots
8/31/2007	Tstorm Wind	50 knots	8/1/2014	Tstorm Wind	50 knots
5/30/2008	Funnel Cloud	-	7/18/2016	Hail	1 inch
7/1/2008	Tstorm Wind	52 knots	8/18/2016	High Wind	50 knots
7/10/2008	High Wind	50 knots	3/17/2017	Heavy Rain	-

Source: NCDS, 2018; Notes: Tstorm = Thunderstorm; “—” = No Data Reported.

### Vulnerability and Area of Impact

Based on review of historic weather data, the entire project area has been classified with a uniform risk for severe weather events. Structures, utilities and human health are most at risk from the heavy snow component of severe winter weather. Loss of power for a couple of days can put citizens with respiratory illness (asbestosis) who need oxygen at risk. Aging infrastructure is a concern expressed at the MHMP public meetings. There is one powerline that serves all of the Tobacco Valley (Lincoln Electric) and Troy (Northern Lights). Flathead Electric services the Libby area and there have been more power outages in recent years.

Loss of access (isolation) is a big issue during winter and medical emergencies are common. The West Kootenai area can get isolated as the bridge across Lake Koocanusa is the only access point. This area has 450 permanent residents with 1,000 to 1,500 in the summer. A year-round Amish community in the West Kootenai area has 30 families.

### Probability and Magnitude

**Tables 4.7-5 and 4.7-6** present severe weather events with reported damages from winter and summer events, respectively, from the SHELDUS database. The dataset used to populate SHELDUS typically includes every loss causing and/or deadly event between 1960 through 1975 and from 1995 onward. Between 1976 and 1995, SHELDUS reflects only events that caused at least one fatality or more than \$50,000 in property or crop damages. In order to compensate for the under-reporting of losses in general and to provide more loss information for rural counties, SHELDUS now reports USDA data, which are all insured losses, i.e. disaster crop insurance payments by USDA.

**Table 4.7-5. Lincoln County Severe Winter Weather Events with Damages**

Date	Injuries	Fatalities	Crop Damage (2016 \$)	Property Damage (2016 \$)	Remarks
1/1961	0	0	\$0	\$10,216	Winter Weather
5/1961	0	0	\$0	\$4,541	Winter Weather
11/1962	0	0	\$0	\$7,098	Wind
12/1964	0	0	\$0	\$34,575	Wind
12/1964	0	0	\$0	\$34,575	Winter Weather
1/1967	0	0	\$0	\$6,418	Wind
4/1968	0	0	\$0	\$39,012	Wind



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**Table 4.7-5. Lincoln County Severe Winter Weather Events with Damages**

Date	Injuries	Fatalities	Crop Damage (2016 \$)	Property Damage (2016 \$)	Remarks
1/1969	0	0	\$0	\$584	Winter Weather
3/1971	0	0	\$0	\$503	Wind
11/1971	0	0	\$0	\$1,117	Winter Weather
1/1972	0	0	\$0	\$14,872	Wind
2/1972	0	0	\$0	\$1,008	Wind
3/1972	0	0	\$0	\$974	Wind
1/1974	0	0	\$0	\$4,426	Wind
12/1974	0	0	\$0	\$855	Wind
10/1975	0	0	\$22,711	\$2,271,127	Winter Weather
4/1987	0	0	\$0	\$17,926	Wind
12/1987	0	0	\$0	\$120	Winter Weather
1/1988	0	0	\$0	\$10	Winter Weather
2/1988	0	0	\$0	\$184	Wind
12/1988	0	0	\$0	\$25,821	Wind
1/1989	0	0	\$274	\$27,372	Winter Weather
2/1989	0	0	\$173	\$172,873	Winter Weather
1/1990	0	0	\$0	\$9,349	Winter Weather
2/1990	0	0	\$0	\$2,337	Wind
3/1990	0	0	\$0	\$203	Winter Weather
4/1990	0	0	\$0	\$2,921	Winter Weather
6/1990	0	0	\$0	\$93	Winter Weather
11/1990	0	0	\$5,499	\$40,114	Wind
12/1990	0	0	\$0	\$49,314	Winter Weather
11/1991	0	0	\$0	\$2,243	Winter Weather
8/1992	0	0	\$75,680	\$742	Winter Weather
12/1992	0	0	\$0	\$2,235	Winter Weather
1/1993	0	0	\$0	\$4,489	Winter Weather
6/1993	0	0	\$0	\$4,228	Winter Weather
11/1993	0	0	\$0	\$21,140	Winter Weather
12/1993	0	0	\$0	\$211	Winter Weather
2/1994	0	0	\$0	\$17,213	Winter Weather
11/1994	0	0	\$0	\$11,778	Winter Weather
1/1995	0	0	\$0	\$2,004	Winter Weather
12/1995	0	0	\$0	\$16,035	Wind
4/2002	2	0	\$0	\$0	Wind
6/2008	0	0	\$0	\$103	Winter Weather
12/2008	0	0	\$0	\$56,751	Winter Weather
1/2009	0	0	\$0	\$1,424	Winter Weather
4/2010	0	0	\$0	\$3,736	Wind
2/2011	0	0	\$0	\$15,210	Wind
3/2012	0	0	\$0	\$142	Wind
3/2012	0	0	\$639	\$0	Winter Weather
4/2013	0	0	\$0	\$1,399	Wind
1/2014	0	0	\$0	\$688	Wind
11/2014	0	0	\$0	\$4,748	Winter Weather
1/2015	0	0	\$0	\$894	Winter Weather
11/2015	0	0	\$0	\$20,621	Wind
11/2015	0	0	\$0	\$3,437	Winter Weather
<b>TOTAL</b>	<b>2</b>	<b>0</b>	<b>\$104,976</b>	<b>\$2,972,008</b>	

Source: SHEL DUS, 2017 (adjusted to 2016 dollars). Notes: \* = USDA Indemnity Payment



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**Table 4.7-5. Lincoln County Severe Winter Weather Events with Damages**

Date	Injuries	Fatalities	Crop Damage (2016 \$)	Property Damage (2016 \$)	Remarks
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Snow generally does not cause the communities to shut down or disrupt activities. Occasionally, though, extreme winter weather conditions can cause problems. The most common incident in these conditions are medical emergencies due to isolation and power outages. Motor vehicle accidents due to poor road conditions can also occur. Such incidents normally involve passenger vehicles; however, an incident involving a commercial vehicle transporting hazardous materials or a vulnerable population such as a school bus is also possible.

Sheltering of community members could present significant logistical problems when maintained over a period of more than a day. Transportation, communication, energy (electric 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.

Windstorms affect areas with significant tree stands, as well as areas with exposed property, major infrastructure, and aboveground utility lines. **Table 4.7-6** presents severe summer weather events with reported damages since 1960 in Lincoln County from the SHEL DUS database.

**Table 4.7-6. Lincoln County Severe Summer Weather Events with Damages**

Date	Injuries	Fatalities	Crop Damage (2016 \$)	Property Damage (2016 \$)	Remarks
6/1964	0	1	\$0	\$394	Wind
6/1965	0	0	\$102,077	\$1,021	Wind
7/1968	0	0	\$0	\$605	Wind
9/1971	0	0	\$0	\$1,775	Wind
9/1973	0	0	\$0	\$17	Wind
7/1974	0	0	\$0	\$413	Wind
6/1977	0	0	\$0	\$33,605	Wind
6/1985	0	0	\$1,320	\$1,320	Wind
7/1991	0	0	\$0	\$4,486	Wind
10/1991	0	0	\$0	\$175,904	Wind
5/1992	0	0	\$0	\$87	Wind
6/1993	0	0	\$0	\$2,819	Wind
7/1997	1	0	\$0	\$1,141,931	Wind
5/1998	1	0	\$0	\$0	Wind
5/2002	1	0	\$0	\$0	Wind
8/2006	1	0	\$0	\$0	Wind
6/2007	1	0	\$0	\$17,679	Wind
7/2007	0	0	\$0	\$20,625	Wind
7/2008	0	0	\$0	\$1,135	Wind
10/2008	0	0	\$0	\$3,263	Wind
10/2012	0	0	\$3,193	\$3,548	Wind
7/2013	0	0	\$0	\$11,644	Wind
8/2014	0	0	\$0	\$5,419	Wind
8/2016	0	0	\$0	\$0	Wind
<b>TOTAL</b>	<b>4</b>	<b>1</b>	<b>\$106,591</b>	<b>\$1,427,691</b>	



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**Table 4.7-6. Lincoln County Severe Summer Weather Events with Damages**

Date	Injuries	Fatalities	Crop Damage (2016 \$)	Property Damage (2016 \$)	Remarks
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Source: SHEL DUS, 2017 (adjusted to 2016 dollars).

Annual loss was computed for the severe summer and winter weather hazard in Lincoln County using SHEL DUS data and the formula: Frequency x Magnitude x Exposure = Annual Loss, as further explained in Section 4.1.6. **Table 4.7-7** presents the results of the calculations.

**Table 4.7-7. Lincoln County Severe Weather Annual Loss**

No. of Events	Period of Record	Frequency	Property Damage	Magnitude	Exposure	Annual Loss
82	55	1.49	\$4,399,699	0.00382%	\$1,404,237,065	\$79,945.75

Severe weather occurs in Lincoln County multiple times each year. Therefore, the probability of a severe storm in either the winter or summer is rated as “highly likely”. The MHMP Planning Team ranked the severe winter weather hazard as “likely”, and event that occurs more than once a decade but not every year, and the severe summer weather hazard as “high likely”. The entire project area has been classified with a uniform risk for the severe weather hazard.

### Future Development

The State of Montana has adopted the 2012 International Building Codes (IBC) which include a provision that buildings must be constructed to withstand a wind load of 75 mph constant velocity and three second gusts of 90 mph and must be designed to withstand a snow load of 30 pounds per square foot minimum. The IBC does not cover single-family residences.

The State of Montana has adopted the 2012 International Residential Code (IRC) for one and two-family residences and townhouses. Local jurisdictions (cities, counties and towns) can elect to become certified to take on enforcement of single-family residences. Libby and Troy have certified building inspectors. Lincoln County and the cities Towns of Eureka and Rexford do not have building departments and therefore, have no enforcement capabilities to ensure State building codes are followed.

### Climate Change

The frequency of severe weather events has increased steadily over the last century. The number of weather-related disasters during the 1990s was four times that of the 1950s, and cost 14 times as much in economic losses. Historical data shows that the probability for severe weather events increases in a warmer climate. There has been a sizable upward trend in the number of storms causing large financial and other losses. Climate change presents a challenge for risk management associated with severe weather.

Montana has seen an uptick in average temperature of about 2 degrees F in the last 50 years, while precipitation has stayed largely the same. At the same time, temperatures at the extremes – the absolute coldest and absolute warmest temperatures of the year have shifted upwards by about 10 degrees for the absolute low, with more days falling into the hotter extreme as well (Independent Record, *Temps Getting Warmer, Nobel-Winning Scientist Says*, March 6, 2018).



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According to the National Climate Change Assessment ([globalchange.gov](http://globalchange.gov), 2014), climate change can and has altered the risk of certain types of extreme weather events. The number of heat waves has been increasing in recent years with the number being almost triple the long-term average. These increases in extreme heat will have many negative consequences, including increases in surface water losses, heat stress, and demand for air conditioning. Rising temperatures are leading to increased demand for water and energy. In parts of the region, this will constrain development, stress natural resources, and increase competition for water among communities, agriculture, energy production, and ecological needs.

Changes in average temperatures can impact vegetation growth and the location and extent of pests. Higher temperatures may also lead to increases in wildfire occurrences. Extreme heat will have a profound effect on vulnerable populations, as most Montana homes do not have air conditioning.

Changing extremes in precipitation are projected across all seasons, including higher likelihoods of both increasing heavy rain and snow events. Winter and spring precipitation is projected to increase in the northern states of the Great Plains, relative to the 1971-2000 average. Winter storms have increased in frequency and intensity since the 1950s, and their tracks have shifted northward over the U.S. Projected changes in summer and fall precipitation are small; however, the number of days with heavy precipitation is expected to increase by mid-century.

For other types of extreme weather events, such as tornadoes and severe thunderstorms, more research is needed to understand how climate change will affect them. These events occur over much smaller scales, which makes observations and modeling more challenging. Projecting the future influence of climate change on these events can also be complicated by the fact that some of the risk factors for these events may increase with climate change, while others may decrease.

Population exposure and vulnerability to severe weather are likely to increase as a result of climate change. Severe weather events may occur more frequently which would lead to increased exposure and vulnerability. Although all people may be affected by the health-related impacts of climate change, the elderly, young children, and people with weakened immune systems are often the most susceptible.

Property exposure and vulnerability may increase as a result of increased severe weather resulting from climate change. Increased structure damage from high winds, hail and snow load could result as well as damage to crops and landscaping. Secondary impacts, such as wildfire, may increase and threaten structures.

Changes to the frequency, severity, and affected area of climate-related hazards may have economic consequences. Potential decreases in agricultural outputs due to severe weather may affect the economy in farming and ranching areas. Communities that rely on tourism may see a decrease in visitors due to severe weather. If these economic effects become widespread, the impacts could be felt at a statewide or regional level (FEMA, 2016).

Critical facility exposure and vulnerability are unlikely to increase as a result of climate change impacts associated with severe weather; however, critical facility owners and operators may experience more frequent disruption to the services they provide. For example, extreme heat can



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decrease the effectiveness of electrical equipment, including power lines, which can lead to blackouts during very hot conditions. An increase in requests for medical assistance during a heat wave may challenge emergency response capabilities. The need for community cooling centers could result an increase in number of critical facilities.



**Description and History**

Terrorism is defined in the Code of Federal Regulations 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.

Lincoln County shares a border with Canada with the Port of Entry at Roosville a 24-hour U.S. Customs border crossing. U.S. Border Patrol officers match names against terrorist watch lists and a host of other data to determine whether a person's background or behavior indicates a terrorist threat, a risk to border security or the potential for illegal activity. They also assess cargo.

Eco-terrorism is the use or threatened use of violence of a criminal nature against innocent victims or property by an environmentally-oriented, subnational group for environmental-political reasons, or aimed at an audience beyond the target, often of a symbolic nature.

Large gatherings in Montana bring increased risk of violence. Many communities host annual events which draw thousands of participants, many from out-of-state. Rainbow Family Gatherings have been held in Montana several times in the past 20 years are another example of large gatherings which pose a risk of violence.

Violent protests and riots resulting from police brutality against African Americans gained widespread notoriety in the 2010s, and the tensions ignited after particular incidents such as the killings of Trayvon Martin (2012), Michael Brown, Jr (2014) and Freddie Gray (2015). The Black Lives Matter Movement, originating in the African-American community in 2013, campaigns against violence and systemic racism toward black people. The movement regularly protests police killings of black people and broader issues of racial profiling, police brutality, and racial inequality in the United States criminal justice system. Due to the demographics of Lincoln County, racial violence is not a great risk.

Civil unrest typically occurs when large groups, organizations, or distraught individuals take action with potentially disastrous or disruptive results. Civil unrest can be the product of another event that creates panic in the community. In Lincoln County, the potential exists for civil unrest to exceed the capabilities of the local government to handle. Active Shooter/Workplace Violence is described in a separate hazard profile in *Section 4.6*.

According to the Southern Poverty Law Center (SPLC, 2018), an organization devoted to tracking hate groups in the U.S., the number of anti-government groups in Montana held steady while anti-Muslim activity surged. Of the 917 hate organizations identified nationally in the latest report, eight are in Montana, including three white nationalist groups, four anti-Muslim groups, and a neo-nazi group. In Montana, hate groups include the American Freedom Party, Pioneer Little Europe, Radix Journal, and ACT for America. There were no hate groups identified in Lincoln County; however, the



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two white nationalist groups are headquartered in neighboring Flathead County. Several hate groups are headquartered in the Idaho Panhandle region which adjoins Lincoln County on the west.

No disaster declarations have been issued to Lincoln County for terrorism, violence, or civil unrest. However, several emergency declarations were issued in Montana to activate the National Guard to assist with these types of incidents (**Table 4.8-1**).

**Table 4.8-1. Montana Terrorism, Violence and Civil Unrest Emergency Declarations**

Declaration	Date	Magnitude	Comments
N/A	Jan-Feb 1979	Activation of National Guard for State Institutions strike	No casualties; \$1,393,714 costs
State EO-03-91	April 1991	Activation of National Guard and Assistance Statewide for State Institutions Strike	No casualties
State EO-10-96	April 23,1996	Incident Response for Anniversary of Waco and Oklahoma City Incidents	No casualties; \$4,368 costs
State EO-23-01	September 11, 2001	Emergency Declaration following the World Trade Center and Pentagon terrorist attacks	No casualties
State EO 26-01	September 28, 2001	National Guard activation to provide personnel for airport security	No casualties

Source: DES, 2018

Cyberterrorism is the use of information technology by terrorist groups and individuals to further their agenda. This can include use of information technology to organize and execute attacks against networks, computer systems and telecommunications infrastructures, or for exchanging information or making threats electronically. Examples are hacking into computer systems, introducing viruses to vulnerable networks, web site defacing, or terroristic threats made via electronic communication. The MHMP Planning Team indicated that schools in Eureka, as well as in Columbia Falls and Kalispell (in neighboring Flathead County) have received cyber threats.

Public interest in cyberterrorism began in the late 1980s with the widespread use of the internet. As 2000 approached, the fear and uncertainty about the millennium bug heightened, as did the potential for attacks by cyber terrorists. The terrorist attacks on September 11, 2001 and the ensuing "War on Terror" led to further media coverage of the potential threats of cyberterrorism in the years following. The possibility of a large attack making use of computer networks to sabotage critical infrastructure with the aim of putting human lives in jeopardy or causing disruption on a national scale, either directly or by disruption of the national economy, has been a concern for the past decade.

Internet fraud is the use of internet services or software with internet access to defraud victims or to otherwise take advantage of them; for example, stealing personal information that leads to identity theft. A very common form of internet fraud is the distribution of rogue security software. The most widespread internet and email scam today is called phishing, where digital thieves lure you into divulging your password info through convincing emails and web pages. These phishing emails and web pages resemble legitimate credit authorities. They frighten or entice you into visiting a phony web page and entering your ID and password. Commonly, the guise is an urgent need to "confirm your identity". They will even offer you a story of how your account has been attacked by hackers to lure you into entering your confidential information. The email message will require you to click on a link. But instead of leading you to the real login site, the link will redirect you to a fake website





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where you may innocently enter your ID and password. This information is intercepted by the scammers, who later access your account and extort money.

Senior citizens are also vulnerable to health care scams. Scammers will call as healthcare or Medicare representatives to gain access to their personal or contact information. They will use their contact information to call seniors back at a later date and say they spoke with their daughter, son or other relative and that it's OK to give them Social Security numbers, driver's license numbers or other personal information.

Con artists are also creating devious schemes to prey on retired persons and their accumulated wealth. Senior citizens are receiving phone calls from scammers who purport to be IRS agents. They claim to be calling about unpaid back taxes and proceed to threaten the senior citizen with arrest, lawsuits, suspension of their driver's license and more. Tax-refund fraud hit \$21 billion in 2016. All it takes to file a false return is a name, date of birth, and social security number; the type of information that is commonly taken when health care insurers are hacked.

### **Vulnerability and Area of Impact**

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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 in an attempt to gain publicity or affect policy. 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. According to the Southern Poverty Law Center, an organization that tracks hate groups in the U.S., no hate groups are currently headquartered in Lincoln County although several exist in neighboring Flathead County and the adjoining Idaho Panhandle.

The effects of civil unrest and violence are typically felt by the population. The greatest risk is to human lives during times of unrest. Looting is commonly found in association with these types of events. Therefore, this hazard places both the population and property at risk. Urban areas and places of public gathering are generally areas of greatest risk.

The vulnerability of local communities to a breach in cyber security is real and presents a serious business risk to government operations. Attacks have the potential to cripple vital government services and damage public infrastructure. All government agencies hold valuable or sensitive material, including citizen records, financial information and procurement data. Therefore, everyone is a target. And in today's highly interconnected world, each agency—no matter how small—is a stepping stone to another. So even a seemingly minor breach can have wide-ranging implications. (Governing Institute, 2017).

Agencies also are under nearly constant assault. Hackers know that state and local governments often lag behind commercial entities in cybersecurity readiness. Consequently, the number of attackers probing municipal systems for vulnerabilities is exploding—everyone from small-time crooks equipped with black-market ransomware kits, to nation states and organized crime syndicates armed with sophisticated cyber weapons. (Governing Institute, 2017).

The threats are wide-spread. Small towns and school districts are hit with ransomware that shuts down computer systems until they make a payment. Thieves steal citizen identities and financial



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information from state agency databases. Water authorities endure surgical strikes that use specialized computer code to destroy water pumps. (Governing Institute, 2017).

Healthcare also faces varied cybersecurity threats that continue to evolve and become more intricate. This includes but is not limited to insider threats, poorly secured web portals, improper data handling, and under-regulated medical data mining. Medical data is more valuable to attackers than financial data, and it can easily be stolen from vulnerable web portals.

It should be noted, that Lincoln County may feel secondary economic impacts from terrorism, civil unrest, or cyber security breaches that affect Montana's regional centers, particularly Kalispell, Missoula, or Helena. Lincoln County relies on these regional centers for services that ensure continuity of operations locally.

### **Probability and Magnitude**

The probability of terrorism, a cyber breach, or civil unrest Lincoln County directly is difficult to determine. The county is not considered a specific terrorist target nor is it an area of high risk for civil unrest. A large-scale attack cannot be ruled out, and therefore, a small probability exists. Of greater probability is a national terrorist incident or cyberattack that has an indirect effect on Lincoln County through its economy.

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. Cyber terrorism could involve destroying or remotely disrupting government computer networks, critical civilian systems such as financial networks or mass media or using computer networks to take over machines that control traffic lights, power plants or dams. If cyber-terrorists managed to disrupt financial markets or media broadcasts, an attack could undermine confidence and cause panic. Attacks could also involve remotely hijacking control systems, with potentially dire consequences, such as breaching dams, colliding airplanes, or shutting down the power grid.

Terrorism and cyberattacks are considered emerging hazards with little to no history in the region but incidents occurring with more frequency across the globe. As such, the probability of a future terrorism/cyber incident in Lincoln County was rated by the Planning Team as "possible".

### **Future Development**

Future development should have little to no impact on the terrorism or violence threat. Given the goals of eco-terrorists; however, future development could serve as the basis for an event over controversial development.

### **Climate Change**

Many academics and national security experts agree that climate change contributes to an uncertain world where terrorism can thrive. Climate change not only threatens the environment, it can lead to greater instability and fuel global conflict and terrorism. Some of the least stable states in the world will face changing weather patterns that reduce arable land and fresh-water supplies, in turn driving mass-migration, provoking resource conflicts, and fostering global health threats.

Both cyber threats and climate change are security risks that can affect the safety and security of our most basic resources, such as water, energy and infrastructure, mostly due to a common factor: interconnectedness. As human beings and as nations, we are and always will be directly connected



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to our environment, as it provides us with the resources necessary for both survival and prosperity. We have also become intimately connected and dependent on our computer-based technologies, with cyberspace and the Internet being a primary conduit (Allen, 2014).

And just as climate change can affect our access to (and supply of) water and energy, a cyber-attack on computers and industrial equipment that run water treatment facilities and power plants can have significant negative consequences (Allen, 2014).



4.9 Dam Failure

CPRI SCORE: 2.55

Description and History

Dams have been placed around Montana for many 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, utilities, and the government. Dams come in all shapes and sizes from small earthen dams to large concrete structures. The structural integrity of a dam depends on its design, maintenance, and weather/drainage situation. Problems arise when a dam fails and people and/or property lie in its inundation area. Dams can fail for a variety of reasons including seismic activity, poor maintenance, overwhelming weather and flow conditions, or by an intentional act. Dam failure can be compared to riverine or flash flooding in the area downstream from the dam, and sometimes for long distances from the dam, depending on the amount of water retained and the drainage area. Other dams may be located in areas that result in little if any damages during a failure.

The U.S. Army Corps of Engineers, National Inventory of Dams website keeps a record of dams across the country. Hazard ratings are given to those dams for emergency management planning purposes. These ratings, high, significant, and low, are based on the potential for loss of life and property damage from the failure of the dam, not the condition or probability of the dam failing, as described in **Table 4.9-1**.

**Table 4.9-1. Hazard Ratings for Dams**

Rating	Description
Low Hazard Potential	Dams assigned the low hazard potential classification are those where failure or misoperation 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	Dams assigned the significant hazard potential classification are those dams where failure or misoperation results in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities, or impact other concerns. Significant hazard potential classification dams are often located in predominantly rural or agricultural areas but could be located in areas with population and significant infrastructure.
High Hazard Potential	Dams assigned the high hazard potential classification are those where failure or misoperation will probably cause loss of human life.

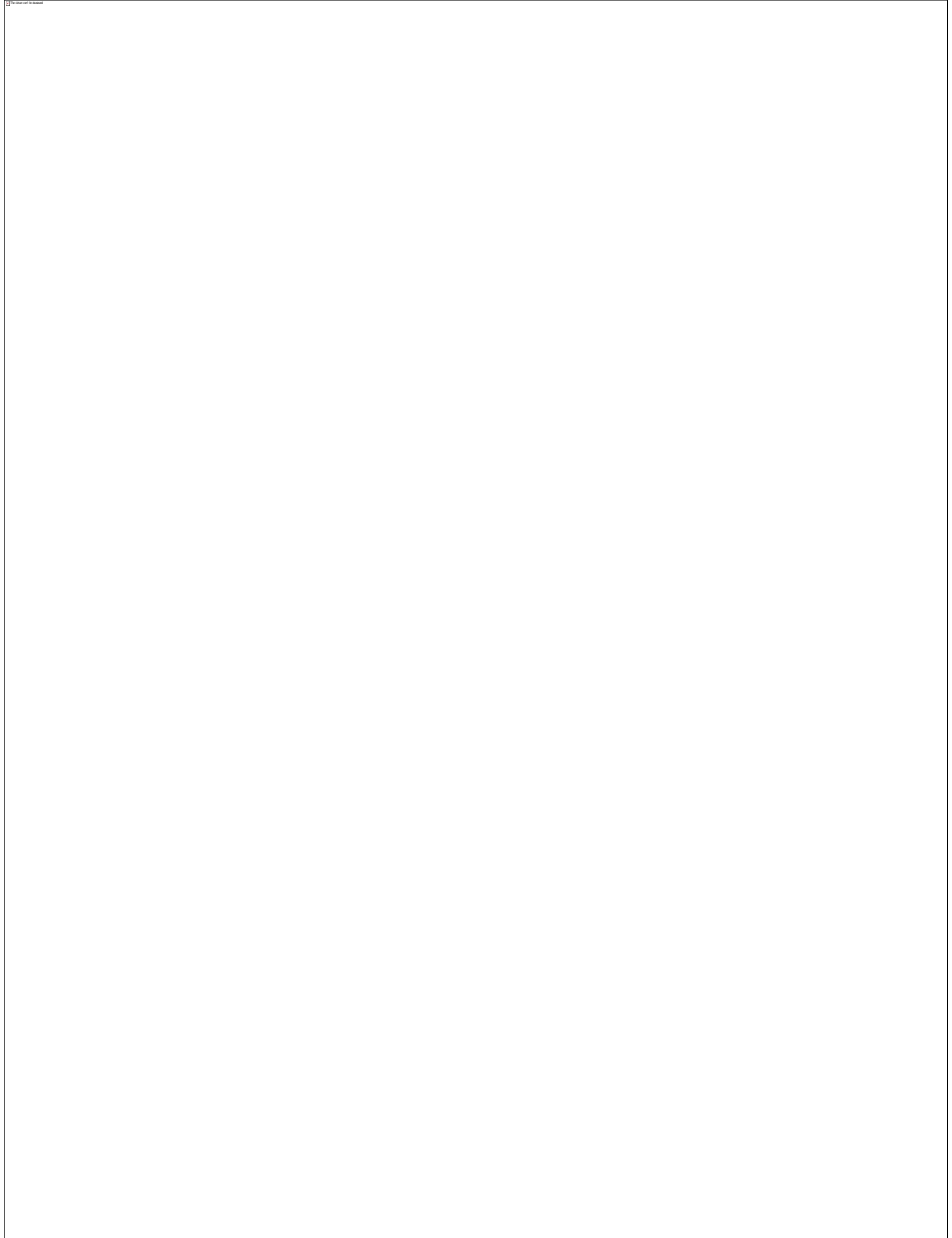
Source: FEMA

Lincoln County has six high hazard dams within the county. There are no dams in adjoining counties, in Idaho, or Canada that would impact Lincoln County if they were to fail. **Table 4.9-2** presents details on the Lincoln County high hazard dams and **Figures 8, 8A, 8B and 8C** shows their location and/or inundation areas for the county, Libby, Troy and Eureka, respectively. Lincoln County EMA has Emergency Action Plans (EAPs) for the high hazard dams in the county. A new EAP is available for the Kootenai Development Impoundment Dam since the 2011 Lincoln County PDM Plan was completed.



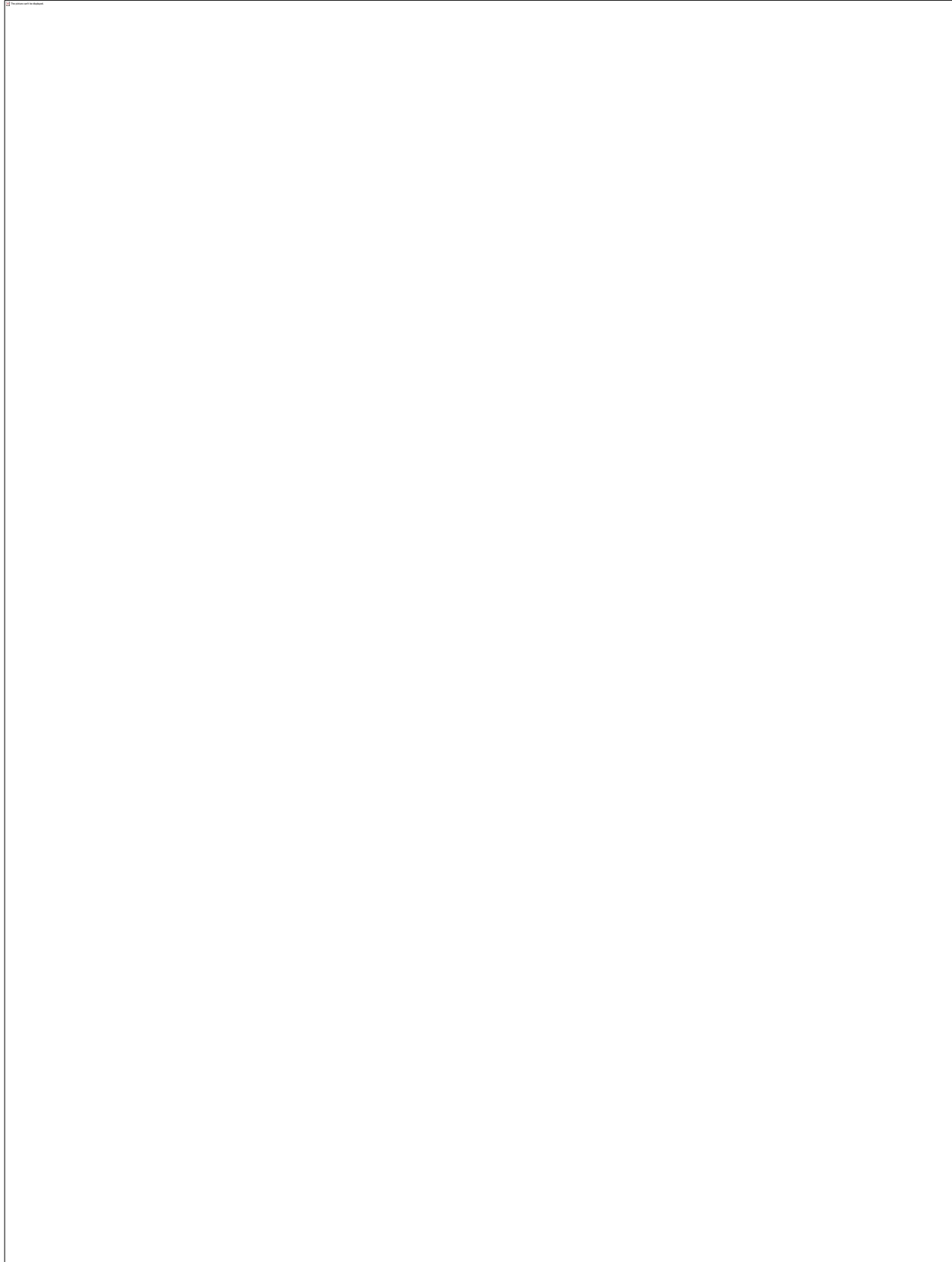
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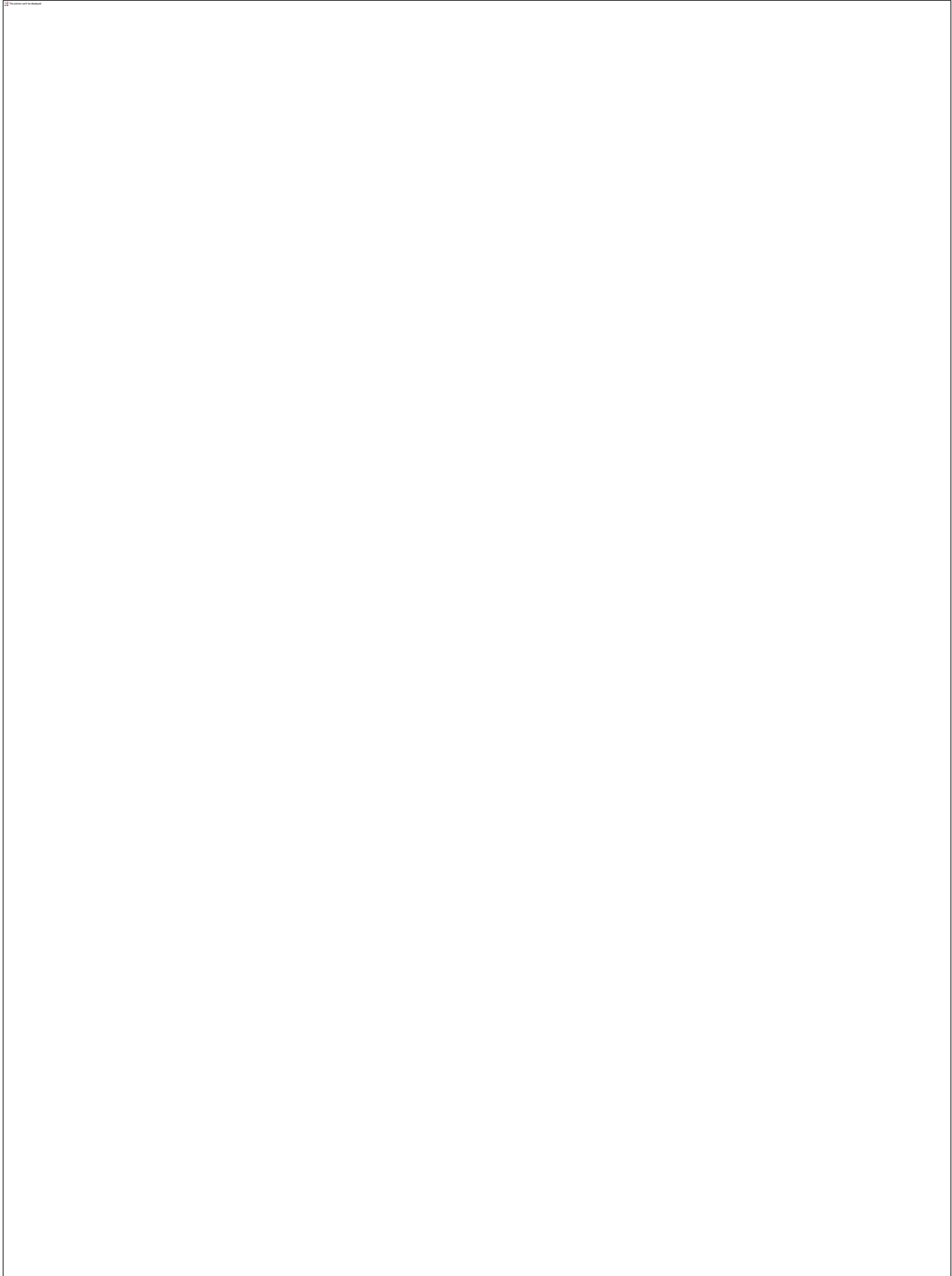
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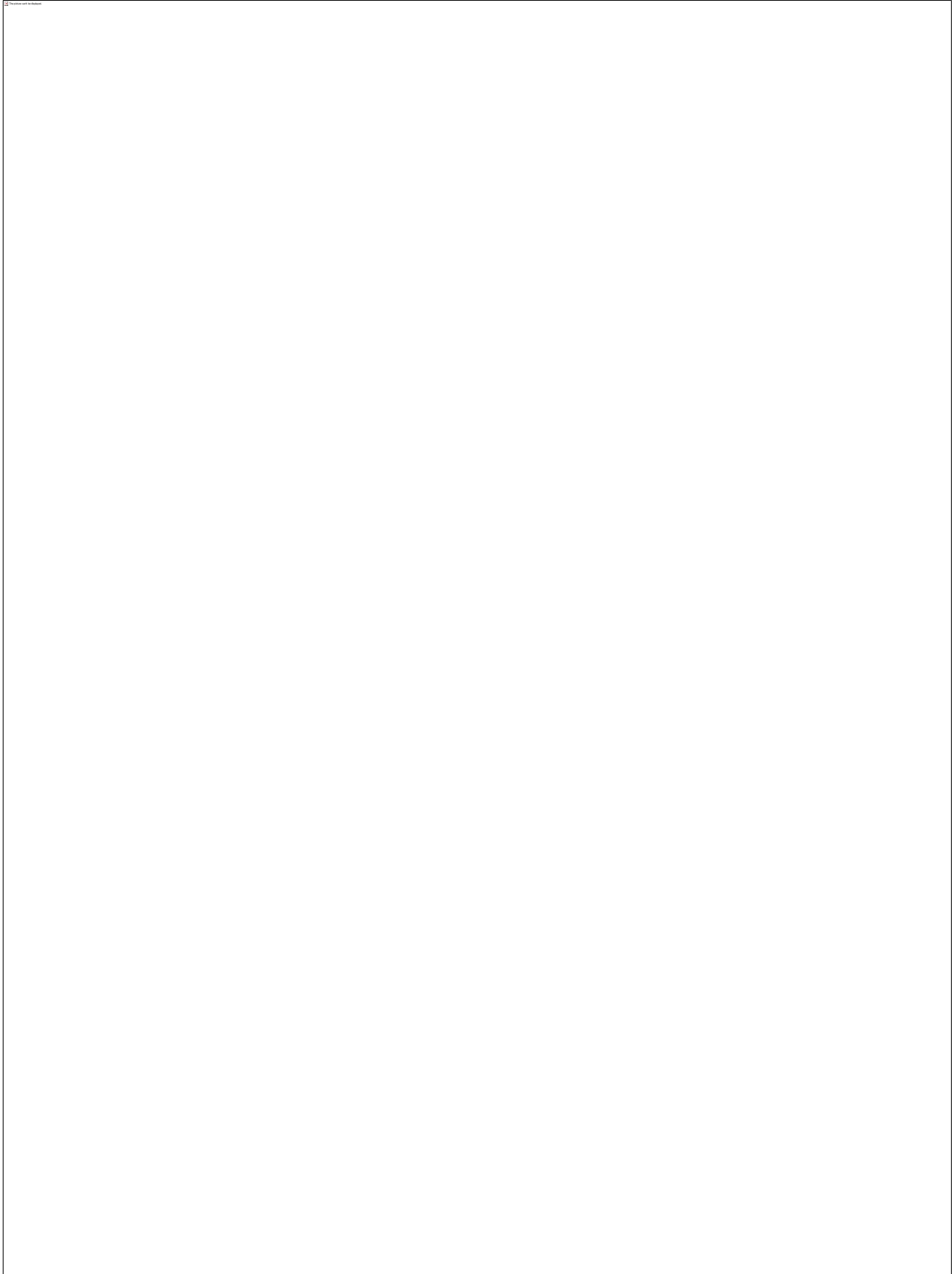
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**Table 4.9-2. High Hazard Dams in Lincoln County**

Dam Name	Nearest Town	Height (feet)	Maximum Storage (acre-ft)	Length (feet)	Year Completed	Purpose	Owner
Flower Creek Dam	Libby	59	285	118	1945	Water Supply	City of Libby
Costich Dam	Eureka	29	570	215	1956	Irrigation	Glen Lake Irrigation District
Glen Lake Dam	Eureka	14	3,580	700	1950	Irrigation	Glen Lake Irrigation District
Kootenai Development Impoundment Dam	Libby	135	2,450	1,154	1980	Other	Kootenai Development Co.
Lake Creek Dam	Troy	35	80	268	1917	Hydroelectric	Northern Lights Inc.
Libby Dam	Libby	422	6,027,000	2,890	1973	Hydroelectric	USACE

Source: National Inventory of Dams, 2018; DNRC, 2018. Notes: USACE = United States Army Corps of Engineers.

There is no record of failure of a high hazard dam in Lincoln County. The MHMP Planning Team recalled a low hazard dam owned by an Amish community in Lincoln County that failed and was not rebuilt. Further details on this incident were unavailable. In May 1948, the Bull Dam near Wardner, British Columbia failed releasing dammed waters which added to the high water coming down into Montana and Idaho (FEMA, 2006). There is no record of fatalities or property damage from this incident. Lincoln County has many remote dams that would require a long response time if an incident occurred.

In May 2011, the Miller Lake Dam located in southeastern Lincoln County overtopped. It is a 9-foot high dam which, according to State law, is not rated as a high hazard dam despite having several residences downstream. According to MT DNRC, the county saved the dam by cleaning out the drop inlet structure during the vulnerable period. The dam owner recently completed spillway repairs.

### **Vulnerability and Area of Impact**

Dams with the highest risk to life and property were they to breach are rated as high hazard dams. Those areas directly downstream from high hazard dams would be the areas most at risk for loss of life and structural damage.

The MT DNRC Dam Safety Program provided input for the 2018 State of Montana MHMP (DNRC, 2018). They indicated that the Kootenai Development Impoundment Dam should either be repaired or decommissioned to handle extreme storms without damage and deterioration of underdrain system should be addressed. They suggest real-time monitoring of instrumentation, monthly inspections, emergency intervention, and early storm warning take place. The Lincoln County MHMP Planning Team indicated that a new box culvert was recently installed at the impoundment dam.

The high hazard Flower Creek Dam provides the City of Libby’s sole source of drinking water. This dam was in a vulnerable state and at risk of failure at the time the 2011 Lincoln County PDM Plan was completed. The City of Libby received over \$8 million in federal assistance to help replace the Flower Creek Dam. Maintenance of the Glen Lake dam is also planned.

**Figures 8, 8A, 8B and 8C** present the inundation area associated with the high hazard dams in Lincoln County, Libby, Troy and Eureka, respectively. The dam failure impact map was developed by compiling electronic and digitized hard copy inundation maps included in Emergency Action Plans,



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as available. Lincoln County EMA participates in dam failure exercises with dam owner(s) and other emergency response personnel when they are held.

The Lincoln County MHMP Planning Team indicated that that the Costich and Glen Lake dams are in succession on the same drainage and if one failed, it could cause failure of the second. They also expressed concern that the Miller Lake Dam was not rated as a high hazard dam and as such, no EAP has been prepared.

### Probability and Magnitude

The dam inundation hazard area was intersected with the general building stock and critical facility datasets using GIS (**Tables 4.9-3**). Vulnerable population was calculated based on U.S. Census 2017 county estimates.

Table 4.9-3. Lincoln County Vulnerability Analysis – Dam Failure

Category	Lincoln Co. (balance)	Libby (city)	Troy (city)	Eureka (town)
Residential Property Exposure \$	\$133,994,613	\$133,386,132	\$26,425,698	\$1,059,835
# Residences at Risk	1,136	1,488	335	10
Commercial & Industrial Property Exposure \$	\$27,535,136	\$61,225,781	\$8,906,587	\$974,640
# Commercial & Industrial Properties at Risk	149	271	62	2
Critical Facilities Exposure Risk \$	\$3,388,276,152	\$111,966,626	\$14,380,738	\$7,585,730
# Critical Facilities at Risk	20	36	14	3
Bridge Exposure \$	\$29,037,200	\$2,577,400	\$845,000	\$244,000
# Bridges at Risk	13	8	1	1
Persons at Risk	1,378	1,830	406	12
Persons Under 18 at Risk	462	613	136	4
Persons Over 65 at Risk	670	1,054	198	6

The GIS analysis indicates that 21,073 (0.9 percent) are located in the dam inundation hazard area including 2,969 residences, 484 commercial and industrial buildings, and 73 critical facilities. The *Dam Failure* section in **Appendix C** presents supporting documentation from the risk assessment including the critical facilities and bridges located in the dam inundation hazard area.

A dam breach could cause significant losses and casualties. Circumstances causing a breach could be structural failure, earthquakes, terrorism, or even a major landslide. Design standards for dams and spillways typically exceed 500-year return intervals for flooding and earthquakes; therefore, the likelihood for a breach to occur are very low. As such, the probability of dam failure is rated as “unlikely”; an event that occurs less than once per 100 years.

### Future Development

Lincoln Clark County subdivision regulations do not currently prevent new construction in dam inundation areas. There are no disclosure requirements that advise developers what property is at risk from dam failure inundation.



**Climate Change**

Small changes in rainfall, runoff, and snowpack conditions may have significant impacts for water resource systems, including dams. Dams are designed partly based on assumptions about a river's flow behavior, expressed as hydrographs. Changes in weather patterns can have significant effects on the hydrograph used for the design of a dam. If the hydrograph changes, it is conceivable that the dam can lose some or all of its designed margin of safety, also known as freeboard. If freeboard is reduced, dam operators may be forced to release increased volumes earlier in a storm cycle in order to maintain the required margins of safety. Such early releases of increased volumes can increase flood potential downstream.

Dams are constructed with safety features known as "spillways." Spillways are put in place on dams as a safety measure in the event of the reservoir filling too quickly. Spillway overflow events, often referred to as "design failures," result in increased discharges downstream and increased flooding potential. Although climate change will not increase the probability of catastrophic dam failure, it may increase the probability of design failures.

Population and property exposure to the dam failure hazard are not likely to change significantly as a result of climate change. The potential increase in probability of dam failure would not likely impact additional areas not already identified on inundation maps with the exception of spillway shadows which are not always captured on inundation maps. Dam owners and operators may need to alter maintenance and operations to account for changes in the hydrograph and increased sedimentation.



## 4.10 Risk Assessment Summary

This section summarizes the results of the individual risk assessments presented under the hazard profiles. Lincoln County has had two repetitive flood losses; however, there have been no repetitive flood losses for the communities of Libby, Troy, Eureka or Rexford. Neither Lincoln County or the incorporated communities have had repetitive loss properties associated with other hazards. Annual loss estimates are presented for each hazard where damage data is available. Future development projects in Lincoln County are discussed as they relate to the hazard areas.

### Composite Hazard Map and Future Development

Figures 9, 9A, 9B and 9C present the composite of hazard prone areas in Lincoln County, Libby, Troy and Eureka, respectively, which is an overlay of the wildfire, flooding, dam failure, and hazardous material incident hazard areas.

Growth policies for Lincoln County (2009), the City of Libby (2010), and the City of Troy (2008) were reviewed for potential future development projects. The MHMP Planning Team weighed in on future development projects. They indicated that the north portion of the county is seeing the most development and a new elementary/junior high school planned for Eureka.

Future development projects are listed in Table 4.10-1 which indicates which hazards each of the future development areas are exposed to. Figures 9, 9A, 9B and 9C shows the location of each project on the composite hazard map for Lincoln County, Libby, Troy and Eureka, respectively.

Table 4.10-1. Future Development Summary

Proposed Project	Hazard Areas							
	Wildfire	Haz-Mat & Transport. Accidents	Flooding	Disease	Workplace Violence/ Active Shooter Incidents	Severe Weather	Terrorism, Civil Unrest & Cyber Security	Dam Failure
Lincoln Co. Rural Fire Station #4, 94 Bobtail Rd., Libby	Yes	No	No	Yes	Yes	Yes	Yes	No
Bull Lake Fire Station, Hwy 56, Troy	Yes	Yes	No	Yes	Yes	Yes	Yes	No
New Eureka Junior/ High School	No	No	No	Yes	Yes	Yes	Yes	No

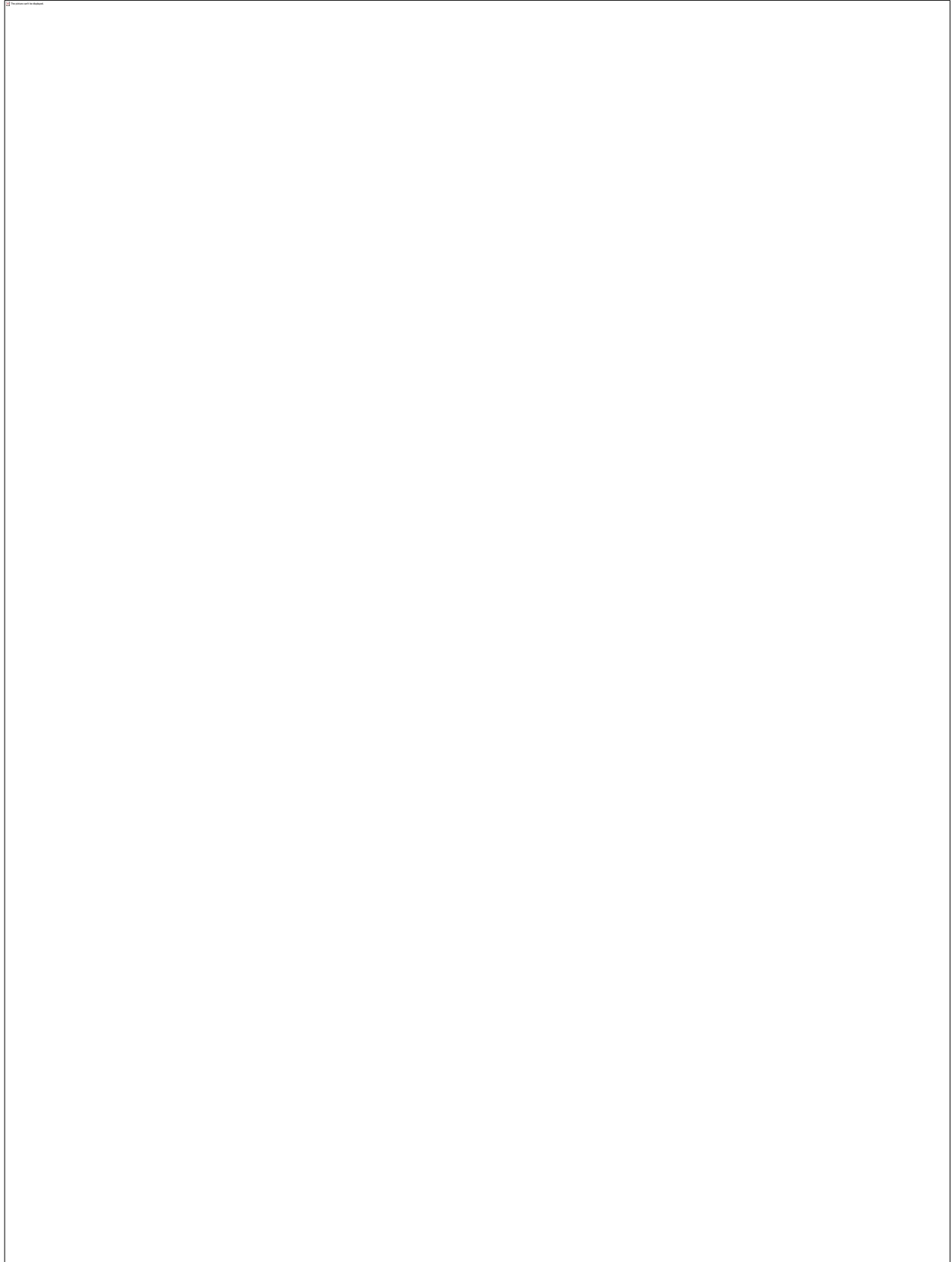
### Vulnerability Analysis - Loss Estimation Summary

Estimating potential losses and calculating risk requires evaluating where hazard areas and vulnerabilities to them coincide, how frequently the hazards occur, and then estimating the magnitude of damage resulting from a hazard event. Rather than estimating loss, a vulnerability assessment was completed which estimates building stock exposure. Section 4.1 presents the methodology for the vulnerability assessment completed for the 2018 MHMP. Tables 4.10-2 through 4.10-5 present the results of the vulnerability assessment for each hazard for residential and commercial/industrial structures, critical facilities, bridges, and population in Lincoln County, Libby, Troy, and Eureka. Appendix C contains supporting information.

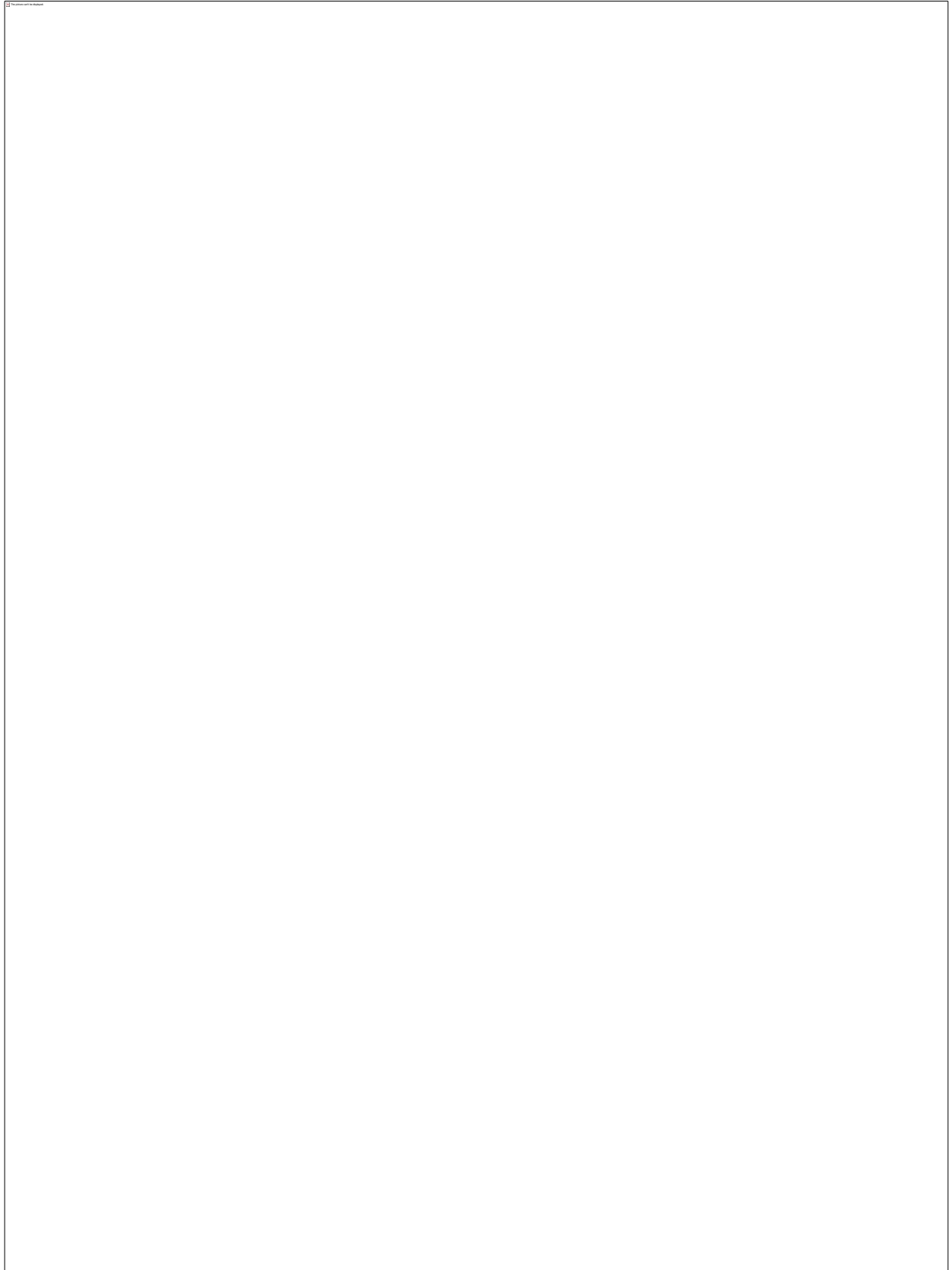


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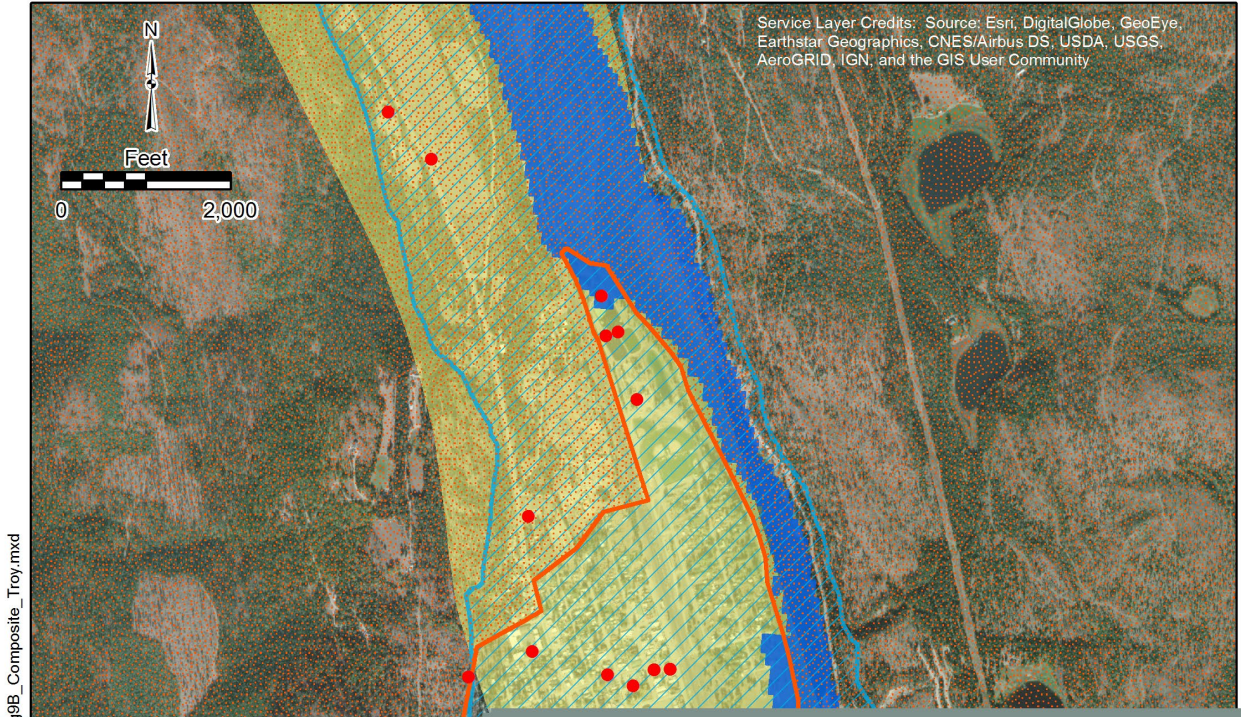
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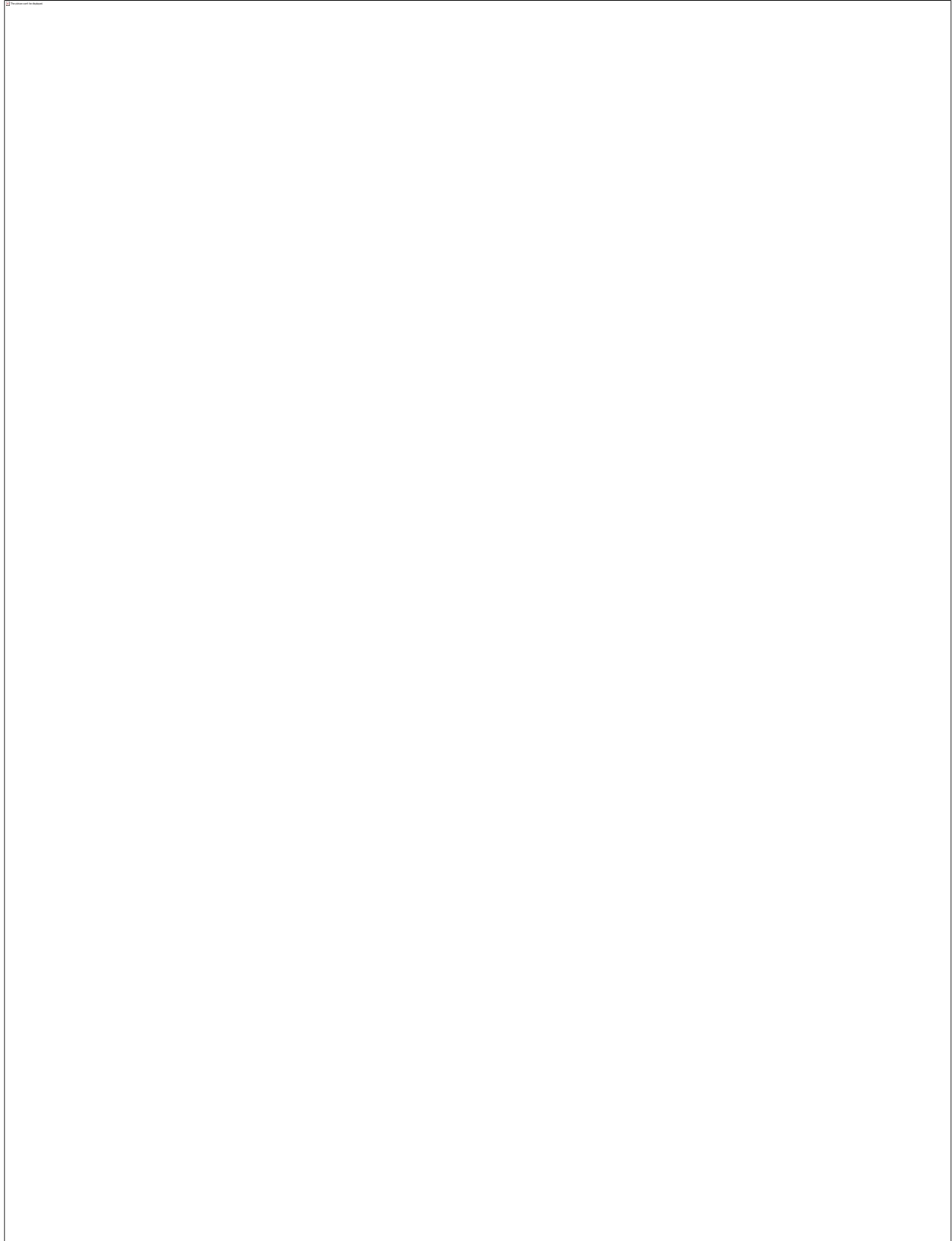




Table 4.10-2. Hazard Vulnerability Summary; Lincoln County (balance)

Hazard	Residential Building Stock - \$ Exposure in Hazard Area	# Residential Structures in Hazard Area	Commercial & Industrial Building Stock - \$ Exposure in Hazard Area	# Commercial & Industrial Structures in Hazard Area	Critical Facility \$ Exposure in Hazard Area	# Critical Facilities Exposure in Hazard Area	Bridge Exposure \$	# Bridges in Hazard Area	Persons in Hazard Area	Under 18 in Hazard Area	Over 65 in Hazard Area
Wildfire	\$761,100,952	5,941	\$343,774,630	1,863	\$46,970,012	72	\$45,662,700	66	7,221	2,420	3,512
Haz-Mat & Transportation Accidents	\$277,202,132	2,453	\$102,846,040	535	\$3,401,769,992	47	\$48,820,500	48	2,976	997	1,447
Flooding	\$48,603,565	444	\$10,601,524	58	\$1,995,731	5	\$41,518,600	38	539	180	262
Disease	\$971,261,484	8,301	\$432,975,581	2,281	\$3,569,247,488	160	\$58,152,100	81	10,188	3,415	5,201
Workplace Violence/Active Shooter Incidents	\$971,261,484	8,301	\$432,975,581	2,281	\$3,569,247,488	160	\$58,152,100	81	10,188	3,415	5,201
Severe Weather	\$971,261,484	8,301	\$432,975,581	2,281	\$3,569,247,488	160	\$58,152,100	81	10,188	3,415	5,201
Terrorism, Civil Unrest & Cyber Security	\$971,261,484	8,301	\$432,975,581	2,281	\$3,569,247,488	160	\$58,152,100	81	10,188	3,415	5,201
Dam Failure	\$133,994,613	1,136	\$27,535,136	149	\$3,388,276,152	20	\$29,037,200	13	1,378	462	670



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Table 4.10-3. Hazard Vulnerability Summary; Libby

Hazard	Residential Building Stock - \$ Exposure in Hazard Area	# Residential Structures in Hazard Area	Commercial & Industrial Building Stock - \$ Exposure in Hazard Area	# Commercial & Industrial Structures in Hazard Area	Critical Facility \$ Exposure in Hazard Area	# Critical Facilities Exposure in Hazard Area	Bridge Exposure \$	# Bridges in Hazard Area	Persons in Hazard Area	Under 18 in Hazard Area	Over 65 in Hazard Area
Wildfire	\$0	0	\$0	0	\$0	0	\$0	0	0	0	0
Haz-Mat & Transportation Accidents	\$77,445,096	860	\$59,015,646	255	\$97,229,549	31	\$2,085,400	5	1,068	358	683
Flooding	\$16,619,963	165	\$5,624,551	25	\$4,399,140	4	\$952,000	7	200	67	97
Disease	\$142,582,798	1,563	\$63,855,800	276	\$123,424,367	38	\$2,577,400	8	1,921	644	1,098
Workplace Violence/Active Shooter Incidents	\$142,582,798	1,563	\$63,855,800	276	\$123,424,367	38	\$2,577,400	8	1,921	644	1,098
Severe Weather	\$142,582,798	1,563	\$63,855,800	276	\$123,424,367	38	\$2,577,400	8	1,921	644	1,098
Terrorism, Civil Unrest & Cyber Security	\$142,582,798	1,563	\$63,855,800	276	\$123,424,367	38	\$2,577,400	8	1,921	644	1,098
Dam Failure	\$133,386,132	1,488	\$61,225,781	271	\$111,966,626	36	\$2,577,400	8	1,830	613	1,054



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**Table 4.10-4. Hazard Vulnerability Summary; Troy**

Hazard	Residential Building Stock - \$ Exposure in Hazard Area	# Residential Structures in Hazard Area	Commercial & Industrial Building Stock - \$ Exposure in Hazard Area	# Commercial & Industrial Structures in Hazard Area	Critical Facility \$ Exposure in Hazard Area	# Critical Facilities Exposure in Hazard Area	Bridge Exposure \$	# Bridges in Hazard Area	Persons in Hazard Area	Under 18 in Hazard Area	Over 65 in Hazard Area
Wildfire	\$0	0	\$0	0	\$0	0	\$0	0	0	0	0
Haz-Mat & Transportation Accidents	\$25,777,421	327	\$8,906,587	62	\$14,380,738	14	\$845,000	1	397	133	193
Flooding	\$419,332	5	\$86,669	1	\$6,000,000	1	\$0	0	6	2	3
Disease	\$26,425,698	355	\$8,906,587	62	\$14,380,738	14	\$845,000	1	406	136	198
Workplace Violence/Active Shooter Incidents	\$26,425,698	355	\$8,906,587	62	\$14,380,738	14	\$845,000	1	406	136	198
Severe Weather	\$26,425,698	355	\$8,906,587	62	\$14,380,738	14	\$845,000	1	406	136	198
Terrorism, Civil Unrest & Cyber Security	\$26,425,698	355	\$8,906,587	62	\$14,380,738	14	\$845,000	1	406	136	198
Dam Failure	\$26,425,698	335	\$8,906,587	62	\$14,380,738	14	\$845,000	1	406	136	198



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Table 4.10-5. Hazard Vulnerability Summary; Eureka

Hazard	Residential Building Stock - \$ Exposure in Hazard Area	# Residential Structures in Hazard Area	Commercial & Industrial Building Stock - \$ Exposure in Hazard Area	# Commercial & Industrial Structures in Hazard Area	Critical Facility \$ Exposure in Hazard Area	# Critical Facilities Exposure in Hazard Area	Bridge Exposure \$	# Bridges in Hazard Area	Persons in Hazard Area	Under 18 in Hazard Area	Over 65 in Hazard Area
Wildfire	\$0	0	\$0	0	\$0	0	\$0	0	0	0	0
Haz-Mat & Transportation Accidents	\$26,186,506	286	\$10,256,935	53	\$10,407,857	13	\$244,000	1	426	143	289
Flooding	\$293,027	4	\$0	0	\$34,488	1	\$244,000	1	5	2	2
Disease	\$36,903,015	408	\$10,986,231	60	\$12,157,857	15	\$244,000	1	574	192	361
Workplace Violence/Active Shooter Incidents	\$36,903,015	408	\$10,986,231	60	\$12,157,857	15	\$244,000	1	574	192	361
Severe Weather	\$36,903,015	408	\$10,986,231	60	\$12,157,857	15	\$244,000	1	574	192	361
Terrorism, Civil Unrest & Cyber Security	\$36,903,015	408	\$10,986,231	60	\$12,157,857	15	\$244,000	1	574	192	361
Dam Failure	\$1,059,835	10	\$974,640	2	\$7,585,730	3	\$244,000	1	12	4	6



## SECTION 5. MITIGATION STRATEGIES

This section presents mitigation actions for Lincoln County, the cities of Libby and Troy, and Town of Eureka to reduce potential exposure and losses from natural, man-made, and technological hazards. The MHMP Planning Team reviewed the Risk Assessment and Vulnerability Analysis to identify and develop the mitigation actions comprising the Lincoln County mitigation strategy.

**Hazard mitigation** reduces the potential impacts of, and costs associated with, emergency and disaster-related events.

Mitigation actions address a range of impacts, including impacts on the population, property, the economy, and the environment.

**Mitigation actions** can include activities such as: revisions to land-use planning, training and education, and structural and nonstructural safety measures.

This section includes:

Background and Past Mitigation Accomplishments

General Mitigation Planning Approach

Mitigation Goals and Objectives

Capability Assessment

Mitigation Strategy Development

### 5.1 Background and Past Mitigation Accomplishments

In accordance with DMA 2000 requirements, a discussion regarding past mitigation activities and an overview of past efforts is provided as a foundation for understanding the mitigation goals, objectives, and activities outlined in this Plan. The county, through previous and ongoing hazard mitigation activities, has demonstrated that it is pro-active in protecting its physical assets and citizens against losses from natural hazards. Completed and ongoing projects since the 2011 PDM Plan was adopted, accomplishments outlined in the 2013 Lincoln County CWPP and projects completed since, include the following:

#### Wildfire

1. Several FireWise communities exist in Lincoln County including Libby (2010), Em Kayan Village (2005) and McCormick (2017). Bull Lake is working toward becoming a FireWise community and the Chain of Lakes is working to become reinstated. FireWise assessments have been completed by the Lincoln County Fire District at numerous properties in the WUI throughout the county with a focus on older subdivisions. **Table 5.1.1** presents accomplishments of the FireWise fuel mitigation program since 2012.
2. In the Libby FireWise Community, more than 200 acres of county parkland have had fuel reduction work. Fuel reduction projects were completed on city properties by the Armory, Libby elementary, middle school and high schools. Grant funds were used to do a fuel reduction project on 15 acres of city property near the Pets for Life facility. Other activities include full fire department engagement, educational programs in the schools, and setup of the FireWise educational trailer at the county fair and local events. The fire department has completed an inventory of city fire risks, access and water sources in much of their area of responsibility. The county has recently completed a fire fuels risk assessment for the WUI area around Libby and is part of the 2013 CWPP.



**Table 5.1-1. Lincoln County Fuel Mitigation Grant Accomplishments; 2013-2018**

Area	Acres Treated 2013-2018	Agreements 2014-2018	Assessments 8/2013-2018	Area	Acres Treated 2013-2018	Agreements 2014-2018	Assessments 8/2013-2018
Em Kayan Village	15	6	11	Bull Lake	129	22	82
Barnaby Lake	-	-	4	Swede/McMillan Mtn	-	-	19
Whispering Pines	-	-	2	Granite Cr/ Woodland Heights	11	5	9
Farm to Market	35	9	17	Cherry Cr/Terrace View	43	7	25
Pine Bay/Rexford Bench	-	-	4	Big Horn/Quartz	2	-	11
Glen Lake	4	2	9	North of Em Kayan	4	1	6
Chain of Lakes	4	1		Sheldon/Ponderosa/Norwood	79	12	8
Rawlings Tract	6	3	4	Libby Edges	19	2	8
Yaak	36	7	100	West Kootenai	28	6	138
Bobtail/Lower Kootenai River Rd.	43	9	25	North Valley /Sophie Lake	-	-	6
Trego/Fortine/Stryker	-	-	2	Tobacco Road	-	-	5
County-wide	39	4		Pipe Creek	5	2	
McCormick	31	8	22	<b>TOTAL</b>	<b>533</b>	<b>106</b>	<b>517</b>

Source: Lincoln County Forester, 2018.

- Federal cost share grants have been an integral part of the county's approach toward reducing the wildfire hazard within the WUI. Landowner fuel reduction projects have been successful with numerous acres treated (see **Table 5.1.1**). Cost share assistance was offered to all of the property owners in the county. The number of the treated areas were significantly expanded by treating adjacent lands through the cooperation of private landowners and agencies: Whispering Pines (USFS), Pine Bay (USFS), Schoolhouse Lake (DNRC 2012), Fairview Heights (Lincoln Co.), Barnaby Lake (Joe Flanigan), Farm to Market (USFS, DNRC), Glen Lake (C. Zook), Bobtail (USFS), Bull Lake (USFS), West Kootenai (USFS).The USFS Kootenai National Forest is putting greater emphasis on fuel reduction and creating fire resistant stands in their planning projects.
- Many evacuation routes in the WUI have had fuel treatments. West Kootenai Road has been thinned by USFS. The Highway 2 corridor to McCormick has been done, along with lower Pipe Creek, and the Bobtail Cutoff. A large portion of the Upper Yaak was done during recent fires and shaded fire breaks have also been accomplished along Granite Creek Road (2016).
- W.R. Grace has completed fuel reduction along access routes and constructed fire breaks in OU3 (2017). The USFS has conducted fuel reduction in the Modified Fire Response Zone (2018).
- Firefighting capabilities have been enhanced in Lincoln County on several fronts. USFS firefighters have been trained and equipped for OU3 fires including the 2017 acquisition of a new decontamination trailer. New fire substations have been built at River Road in Libby (2018), and Savage Lake and Kootenai Vista in Troy. There is improved communication and equipment across all districts including new repeaters in the West Kootenai (2017) and Mount Henry (2013), Meadow Peak (2015), Mount Marston (2013), and Black Butte (2015), a new water tank at the Libby airport (2018), a high-volume capacity pumping station at Bull Lake (2015) which has reduced fill times by 50 percent, and a gravity-feed water fill site tied into irrigation in the West Kootenai area in 2005 became the primary and critical fill site during the



- 2017 Caribou Fire that resulted in widespread evacuations in the West Kootenai and structure losses.
7. The Libby Asbestos Response Plan (LARP) was completed in March 2018 to provide plans and protocols regarding public information and monitoring for a wildfire in or around OU3 of the Libby Asbestos Superfund Site.
  8. In Libby, free chipping of slash piles was offered in order to reduce burning. Cost incentives were also offered for the removal of biomass in lieu of burning. The saw log and pulp market helped remove unwanted slash and biomass.
  9. Lincoln County Subdivision Regulations were updated in 2015 and the City of Libby Subdivision Regulations were adopted in 2011 with requirements for adequate water supply for firefighting and a requirement for adequate means of ingress and egress.
  10. In 2012, FireWise assessment training was provided to 9 of the county fire departments. In 2011 and 2012 FireWise assessment training was given to over 80 Libby Middle School eight grade students at an actual residence as a part of a two-day FireWise course. As a part of their homework the students were required to do a FireWise assessment with their parents on their own home. A hot line number was established for free assessments funded by the county.
  11. Libby RFD is in process of building a database which eventually will contain valuable information on fire risks, access points, water sources, hazards, etc. The county has assigned a risk rating to the fuels in and around the Libby and Eureka WUI which will become a part of this database.
  12. There have been numerous presentations by the County Forester, USFS, and DNRC to communities throughout the county on wildfire preparedness and mitigation. The county has sponsored the Libby and Eureka Bus Tour/BBQ which is intended to inform community leaders of FireWise programs. The FireSafe Council sponsors monthly FireWise messages in the county newspapers during the fire season. Numerous educational programs are ongoing in the county schools. In 2012 Provider Pals worked with the Libby Campus of Flathead Community College provided a one-week FireWise camp for Lincoln County school students and a one-week camp for county teachers. The Governor's Office has designated the month of May as wildfire preparedness month and this has been used this as an opportunity to get out the word on the FireWise program, including a county proclamation, newspaper articles and radio announcements. A FireWise Trailer was designed exclusively as an educational tool is brought around to county-wide events including the Troy Fourth of July celebration, Libby Logger Days, Eureka County Fair, etc. The staffed trailer provide handouts, shows videos and provides other promotional FireWise materials.

#### **Haz-Mat Incidents & Transportation Accidents**

13. Lincoln County has one haz-mat trailer that can be easily moved around the county as needed. The USFS obtained a new decontamination trailer in 2018.
14. BNSF is in the process of abandoning two dangerous railroad crossings in Libby. A new crossing was developed on Haul Road to replace the crossing at 5<sup>th</sup> Street Extension.
15. Six Lincoln County fire dept. members attended a training in Pueblo, CO put on by BNSF on railroad derailments.
16. Lincoln County fire depts. train with the regional haz-mat team in Kalispell.



### **Flooding**

17. Lincoln County has been proactive and uses equipment to break up ice on creeks prone to ice jam flooding. During February 2017, the Flower Creek Task Force, made up of responders, elected officials, city/county employees, law enforcement officers, and contractors, met to discuss ice jam mitigation measures. These included releasing a minimal amount of warmer water from the Flower Creek Dam with the expectation of melting a channel in the ice, then slowly, breaking up and/or removing ice within the confines of Flower Creek. During the operation, equipment was staged at each bridge to watch for ice movement and ice removal. (The Western News, *Flower Creek Task Force Mobilizing*, February 13, 2017). The county has also shored up bridge embankments along Cherry, Granite, and Callahan Creeks to mitigate flood impacts.
18. A channel of Parmenter Creek was rerouted to provide overflow relief during flooding.
19. Vegetation is regularly cleared off the county's levees and access has been improved to several locations. The Callahan Creek levee was reinforced.
20. Culverts on Meadow and Balsam Creeks were upgraded as well as many private approaches which now have culverts.
21. Stormwater basins are regularly dredged out to allow for discharge to the river.
22. Armoring was used to reinforce stream banks at Hammer Cutoff, Libby Creek, and Cherry/Granite Creek Roads.
23. Floodplain maps and information on the NFIP is available on the county's website.

### **Disease**

24. Since the 2011 PDM Plan was completed, Lincoln Co. now has a Health Department.
25. The Lincoln Co. Health Dept. provides surveillance, disease investigations, and vaccination clinics as well as education on disease prevention, sanitation and healthy living.

### **Workplace Violence/Active Shooter Incidents**

26. Most law enforcement and first responders within the county have active shooter training.
27. Vulnerability assessments have been completed at most critical facilities with recommendations for physical hardening.

### **Severe Weather**

28. Law enforcement reaches out to special needs populations during severe winter weather.
29. A resource list of snow shovelers is kept up to date and made available to the public.

### **Terrorism, Civil Unrest & Cyber Security**

30. Law enforcement and response entities receive training to respond to terrorism threats.
31. New employees receive orientation on network and cyber security.
32. Regular assessments are made of critical cyber infrastructure including fire walls and networks.

### **Dam Failure**

33. The Flower Creek Dam was replaced in 2015.
34. Public meetings were held with residents living in the inundation area during the Flower Creek Dam replacement project.





35. A technical study and inundation map were completed for the Miller Lake Dam.
36. Dam owners conduct table tops and/or exercises annually on the high-hazard dams in the county including Libby Dam (USACE) and Lake Creek Dam (Northern Lights).

#### **All Hazards**

37. Emergency communications have been improved in Lincoln County including the Libby Rural Fire Dept. Back-up generators have been installed at all repeater sites and improvements have been made to the Meadow Peak repeater. The county has acquired 10 vehicle mounted repeaters. Enhanced 911 (Code Red) is in operation.
38. Emergency shelters that comply with American Red Cross guidelines have been identified in all communities.
39. A private individual has gone around to special needs facilities educating them on Code Red system.
40. Emergency generators have been installed at various critical facilities including the Libby water treatment plant.
41. GIS data has been improved to better assist with mitigation. Maps are now available on fire severity in WUI area. The Sheriff's office is using GIS for vehicle accidents and haz-mat situations. Fire Depts. are continuously getting updated road books and wall maps. GIS staff has been provided with more training.

## **5.2 General Mitigation Planning Approach**

The overall approach used to update the Lincoln County mitigation strategy was based on FEMA guidance regarding local mitigation plan development, including:

1. DMA 2000 regulations, specifically 44 CFR 201.6 (local mitigation planning)
2. FEMA "Local Mitigation Planning Handbook", March 2013
3. FEMA "Integrating Hazard Mitigation into Local Planning", March 2013
4. Identifying Mitigation Actions and Implementing Strategies (FEMA 386-3)
5. FEMA "Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards", January 2013

The mitigation strategy approach includes the following steps that are further detailed in later sections of this Plan:

1. Review and update mitigation goals and objectives.
2. Identify mitigation capabilities and evaluate their capacity and effectiveness to mitigate and manage hazard risk.
3. Identify past and ongoing mitigation activities throughout the county.
4. Identify appropriate county and local mitigation strategies to address the regions risk to natural and man-made hazards.
5. Prepare an implementation strategy, including the prioritization of projects in the mitigation strategy.





### 5.3 Mitigation Goals and Objectives

This section documents the efforts to develop hazard mitigation goals and objectives established to reduce or avoid long-term vulnerabilities to the identified hazards. According to CFR 201.6(c)(3)(i): “The hazard mitigation strategy shall include a description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.” For the purposes of this plan, goals are defined as follows:

**Goals** are general guidelines that explain what is to be achieved. They are usually broad, long-term, policy-type statements and represent global visions. Goals help define the benefits that the plan is trying to achieve. The success of the plan, once implemented, should be measured by the degree to which its goals have been met (that is, by the actual benefits in terms of hazard mitigation).

The 2011 Lincoln County PDM Plan had 11 goals; one goal specific to each of 10 hazards and an all hazard goal. This methodology is consistent with goals outlined in the 2018 MHMP.

FEMA defines Objectives as strategies or implementation steps to attain mitigation goals. Unlike goals, objectives are specific and measurable, where feasible. Mitigation objectives developed for the 2018 MHMP are generally consistent with those outlined in the 2011 PDM Plan. Where appropriate, mitigation objectives reflect FEMA’s “Local Mitigation Planning Handbook, March 2013” guidelines (see Section 5.5.1) as either: Public Education and Awareness, Property Protection, Prevention, Structural, Natural Resource Protection, or Emergency Services, with an objective added for Planning/Analysis/Mapping projects. Mitigation goals and objectives for the 2018 MHMP are presented in **Table 5.3-1**.

**Table 5.3-1. Summary of Goals and Objectives**

Goal #	Goal Statement	Objective #	2018 Goal/Objective Statement
1	Reduce Impacts from Wildfire	1.1	Implement Actions to Prevent Impacts from Wildfire
		1.2	Enhance Opportunities to Protect Property from Wildfire
		1.3	Enhance Emergency Service Capabilities to Mitigate Impacts from Wildfire
		1.4	Provide Public Education and Awareness on Wildfire Mitigation
		1.5	Implement Planning, Analysis, and Mapping Projects to Reduce Impacts from Wildfire
2	Reduce Impacts from Haz-Mat Incidents & Transportation Accidents	2.1	Enhance Emergency Service Capabilities to Mitigate Impacts from Haz-Mat Incidents/Transportation Accidents
		2.2	Provide Public Education and Awareness on Haz-Mat Incidents/Transportation Accidents
		2.3	Implement Planning, Analysis, and Mapping Projects to Reduce Impacts from Haz-Mat Incidents/Transportation Accidents
3	Reduce Impacts from Flooding	3.1	Enhance Opportunities to Protect Property from Flooding
		3.2	Implement Structural Projects to Reduce Impacts from Flooding
		3.3	Provide Public Education and Awareness on Flooding
		3.4	Implement Planning, Analysis, and Mapping Projects to Reduce Impacts from Flooding
		3.5	Implement Prevention Projects to Reduce Impacts from Flooding



**Table 5.3-1. Summary of Goals and Objectives**

Goal #	Goal Statement	Objective #	2018 Goal/Objective Statement
4	Reduce Impacts from Disease	4.1	Promote Activities to Minimize Disease Outbreaks and Impacts
		4.2	Provide Public Education and Awareness on Disease
		4.3	Enhance Emergency Service Capabilities to Mitigate Impacts from Disease
5	Reduce Impacts from Workplace Violence/Active Shooter Incidents	5.1	Provide Public Education and Awareness on Workplace Violence / Active Shooter
		5.2	Enhance Emergency Service Capabilities to Mitigate Impacts from Workplace Violence / Active Shooter Incidents
		5.3	Enhance Opportunities to Protect Property from Workplace Violence / Active Shooter
6	Reduce Impacts from Severe Weather	6.1	Provide Public Education and Awareness on Severe Weather
7	Reduce Impacts from Terrorism, Civil Unrest & Cyber Security	7.1	Enhance Emergency Service Capabilities to Mitigate Impacts from Terrorism, Civil Unrest & Cyber Security
		7.2	Provide Public Education and Awareness on Terrorism, Civil Unrest & Cyber Security
		7.3	Implement Planning, Analysis, and Mapping Projects to Reduce Impacts from Terrorism, Civil Unrest & Cyber Security
8	Reduce Impacts from Dam Failure	8.1	Enhance Emergency Services to Mitigate Impacts from Dam Failure
9	Reduce Impacts from All Hazards	9.1	Enhance Emergency Service Capabilities to Mitigate Impacts from All-Hazards
		9.2	Provide Public Education and Awareness on All-Hazards
		9.3	Implement Planning, Analysis, and Mapping Projects to Reduce Impacts from All-Hazards

## 5.4 Capability Assessment

The goals and objectives used to mitigate natural and technological hazards build on the community’s existing capabilities. Lincoln County’s capabilities to support and implement mitigation projects include the programs and resources of various local, regional, tribal, state, and federal partners and the administrative and technical capabilities of county and city staff who implement the legal and regulatory requirements used to manage growth (zoning, building codes, subdivision regulations, and floodplain ordinances).

Lincoln County’s hazard mitigation capabilities are summarized below. These resources have the responsibility to provide overview of past, current, and ongoing pre- and post-disaster mitigation projects including capital improvement programs, wildfire mitigation programs, stormwater management programs, and NFIP compliance projects. The fiscal capabilities of the county, Libby, Troy, and Eureka support hazard mitigation and provide the funding to implement the Lincoln County mitigation strategy.

### 5.4.1 Summary of Programs and Resources Available to Support Mitigation

A number of programs and resources in Lincoln County support mitigation efforts. These are described below.

#### National Flood Insurance Program



The NFIP is aimed at reducing the impact of flooding on private and public structures. This is achieved by providing affordable insurance for property owners and by encouraging communities to adopt and enforce floodplain management regulations. These efforts help mitigate the effects of flooding on new and improved structures. Overall, the program reduces the socio-economic impact of disasters by promoting the purchase and retention of Risk Insurance in general, and NFIP in particular.

**NFIP Community Rating System**

As an additional component of the NFIP, the Community Rating System is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. As a result, flood insurance premium rates are discounted to reflect the reduced flood risk resulting from the community actions meeting the three goals of the CRS: (1) reduce flood losses; (2) facilitate accurate insurance rating; and (3) promote the awareness of flood insurance. Lincoln County and the communities of Libby, Troy and Eureka do not currently participate in the CRS program.

**5.4.2 Administrative and Technical Capabilities**

Lincoln County’s administrative and technical capabilities to implement mitigation projects include planners, engineers and floodplain managers, GIS personnel, emergency managers, and financial, legal and regulatory requirements. Expertise from local and regional planning partners also contribute to mitigation capabilities for the county and communities of Libby, Troy, and Eureka. Several of these entities are described below. **Table 5.4-1** summarizes the capabilities of the jurisdictions adopting this MHMP to accomplish hazard mitigation. *Section 3.7* provides additional discussion on many of these policies.

**Table 5.4-1. Capability Assessment Summary**

Capability	Lincoln County	City of Libby	City of Troy	Town of Eureka	Town of Rexford
Population (2016/17 est.)	19,440	2,691	904	1,100	153
<b>Policies and Programs</b>					
Growth Policy that Supports Hazard Mitigation	Yes	Yes	Yes	No	No
Subdivision Regulations that Support Hazard Mitigation	Yes	Yes	Uses County’s	Uses County’s	
Zoning that Recognizes Hazard Areas	No	Yes	No	No	
National Flood Insurance Program Participation	Yes	Yes	Yes	Yes	No
Local Building Codes	No	Yes	Yes	No	
<b>Technical Capabilities</b>					
Emergency Manager	Yes	No	No	No	No
Public Works Engineer	Yes	Yes	No	Yes	Yes
GIS Mapping Capabilities	Yes	No	No	Yes	No
Floodplain Administrator	Yes	Yes	Yes	Yes	No
Community Planners	Yes	Yes	No	No	No

**Lincoln County Emergency Management Agency**



The mission of Lincoln County EMA is to save lives, prevent injury, and protect property and the environment by taking reasonable and affordable measures to mitigate, prepare for, respond to and recover from disasters. The Lincoln County EMA director is responsible for the planning, coordination, and implementation of all emergency management and Homeland Security related activities for the county. Other responsibilities include coordination of activities for the county's Emergency Operations Center. The EOC, when activated, is a central location where representatives of local government and private sector agencies convene during disaster situations to make decisions, set priorities and coordinate resources for response and recovery. These efforts are designed to enhance the capacity of the local government to plan for, respond to, and mitigate the consequences of threats and disasters using an all-hazard framework.

The Lincoln County EMA office includes one full-time staff position; the Emergency Manager (DES Coordinator) who devotes 100 percent of his time to emergency management. This position is funded 50 percent federal through the Emergency Management Performance Grant (EMPG) program and 50 percent through the county general fund.

#### **Local Emergency Planning Committee**

The mission of the Lincoln County LEPC is to provide resources and guidance to the community through education, coordination and assistance in hazmat planning; and 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 LEPC consists of representatives from businesses, local government, emergency responders and citizen groups located in Lincoln County. Quarterly meetings are held at the EMA Office in Libby.

#### **Lincoln County Planning Department**

The Lincoln County Planning Department provides land use planning and implementation services to the citizens and elected officials of Lincoln County, the cities of Libby and Troy, and the Town of Eureka. The Department seeks to effectively improve the health, safety and welfare of all Lincoln County residents through active involvement in community and economic development, natural resources and land-use planning. The department works to ensure that adequate public services exist to meet future needs. The department promotes development that contributes to community goals as stated in the Lincoln County Growth Policy; supports elected officials and agency co-workers in their efforts to improve the public health, safety and welfare of the citizens (both present and future) of Lincoln County; and, encourages public participation in planning for the future. Responsibilities include: administration of all land use planning functions at a local government level; preparation of recommendations for the Lincoln County Commissioners on all land development proposals; works with the Lincoln County Planning Board to implement the Lincoln County Growth Policy including land use policy recommendations and project review; administration of the Lincoln County Subdivision Regulations, Floodplain Regulations and Lakeshore Construction permits; assigns rural addresses in conformance with the Enhanced-911 system; and, provides data analysis and maps by maintaining an accurate geographic information system.

#### **Lincoln County Fire Protection Services**

Lincoln County is fortunate to be protected by very capable and dedicated fire suppression organizations. These organizations include the U.S. Forest Service, DNRC and 10 volunteer fire departments. The Lincoln County Fire Co-op is the coordinating group for fire suppression and in



addition to the fire suppression organizations includes Lincoln County Emergency Management, the sheriff's department and the Lincoln County Forester. The Lincoln County Interagency Management Operating Procedures serve as an Operating Guide among all federal, state, and local government agencies in Lincoln County with wildland fire protection responsibilities. Although at times there can be some overlap between the Lincoln County FireSafe Council and the Fire Co-op these lines of responsibility have not been a problem.

### **Lincoln County FireSafe Council**

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The Lincoln County FireSafe Council is a nonprofit group that helps citizens of the county prepare for a wildfire. The group is made up of local, state, and federal representatives including local citizens, local businesses, and contractors from the area brought together to promote fire mitigation and prevention. The Council is a platform for sharing information, improving coordination and fostering cooperation between a diverse group of interests with similar or overlapping goals.

The group has had the primary mission of fire prevention education and helping homeowners survive a wildland residential interface fire. Much of the group's efforts are directed toward educating homeowners about reducing and managing fuel buildup, building and maintaining adequate road systems, providing adequate water supplies, and the use of fire-resistant materials and designs for homes and outbuildings. The Council has also served as a platform for implementing new and innovative ideas including FireWise permitting restrictions on new county subdivisions, treatment of the Flower Creek Municipal Watershed and numerous FireWise educational projects. The group meets on a monthly basis.

### **Lincoln County Fire Co-op**

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The Lincoln County Fire Co-op is a leadership group responsible for the planning oversight of all county initiatives to reduce fire hazards within the county. This group coordinates information and then advises the Board of Commissioners on the fire danger and recommends the appropriate fire restriction level. The Fire Co-op is comprised of all of the volunteer fire departments as well as State and Federal agencies with firefighting responsibility including the following:

1. Montana DNRC
2. USDA Forest Service - Kootenai National Forest
3. Lincoln County Director of Emergency Management
4. Chief, Bull Lake Rural Fire District
5. Chief, Eureka Fire Service Area
6. Chief, Fisher River Valley Fire Service Area
7. Chief, Lincoln County Rural Fire District #1
8. Chief, McCormick Rural Fire District
9. Chief, Trego, Fortine, Stryker Fire Service Area
10. Chief, Troy Rural Fire District
11. Chief, Yaak Fire Service Area
12. Chief, West Kootenai Volunteer Fire Dept.

### **Lincoln County Health Dept.**

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The Lincoln County Health Department works to prevent, identify and limit the spread of those diseases that can be passed from one person to another. Working together with area health care



providers, they investigate and track individual cases to prevent them from spreading further. They also aim to determine the source of an infection, identify contacts, and provide education to the general public.

### **U.S. Forest Service – Kootenai National Forest**

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Kootenai National Forest is located in the extreme northwest corner of Montana and northeast Idaho and encompasses over 2.2 million acres. Of the total acres, 50,384 are within the State of Idaho. Fire management on the Kootenai National Forest encompasses a variety of tools. These include wildland fire, prescribed burning, fire prevention and smoke management. By using these tools, protection of private land, management of the forest and air quality can be enhanced. In the past, fire has played a major role in shaping the Kootenai National Forest. The Kootenai National Forest has played a major role in helping reduce the fire risk to Lincoln County.

Several members of the FireSafe Council, including the County Forester, have been actively involved with the Kootenai National Forest Stakeholder Coalition. This diverse group of interests seeks to find consensus on Forest projects in order to limit the number of appeals and litigation, which have delayed or stopped many projects. The County Forester seeks to represent the county's interests in reducing the wildfire risk to citizens while helping to provide jobs in the logging and milling sectors.

### **Montana DNRC**

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The Forestry Division, of the Montana DNRC is responsible for planning and implementing forestry and fire management programs through an extensive network of staff located in field offices across the State. The Fire and Aviation Management Bureau provides resources, leadership and coordination to Montana's wildland fire services to protect lives, property, and natural resources; working with local, tribal, state, and federal partners to ensure wildfire protection on all state and private land in Montana. There are numerous programs aimed at effective fire preparedness and capacity building. The Fire Preparedness effort is focused in four areas:

1. Fire Prevention Program seeks to educate Montanans about fire risk, the wildland urban interface and reducing human-caused fires;
2. Fire Training Program provides statewide training opportunities for DNRC and local government personnel;
3. Equipment Development Center builds and maintains wildland fire equipment and radio communications;
4. Fire Support Programs provide financial and technical expertise to assist all fire programs in meeting their respective goals and mandates. These include, but not limited to: Fire Assessment fees, GIS, repair and maintenance of radio systems and rolling stock equipment.

### **FireSafe Montana**

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FireSafe Montana is a private, non-profit organization coordinating and supporting a statewide coalition of diverse interests working together to help Montanans make their homes, neighborhoods, and communities fire safe. FireSafe Montana actively encourages and assists in the development of local FireSafe councils across the state. These councils are key to raising public awareness of local wildland fire threats and issues, motivating residents to take positive action, and providing access to the expertise and resources homeowners need to get the job done. When people take personal





responsibility for applying and maintaining FireWise practices on their property, they greatly increase the chances of their homes surviving a wildfire.

Through its public information programs and materials, website, newsletter, and special events, as well as its active involvement in federal, state, and local fire mitigation efforts, FireSafe Montana is working hard to reduce the potential loss of life and property from wildfire in Montana.

### **National Fire Prevention Association's (NFPA) FireWise Communities Program**

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NFPA's FireWise Communities Program encourages local solutions for safety by involving homeowners in taking individual responsibility for preparing their homes from the risk of wildfire. FireWise is a key component of Fire Adapted Communities – a collaborative approach that connects all those who play a role in wildfire education, planning and action with comprehensive resources to help reduce risk. The program is co-sponsored by the U.S. Forest Service, the U.S. Department of the Interior, and the National Association of State Foresters. To save lives and property from wildfire, NFPA's FireWise Communities program teaches people how to adapt to living with wildfire and encourages neighbors to work together and take action now to prevent losses. They advocate playing a role in protecting ourselves and each other from the risk of wildfire.

### **NOAA Weather-Ready Nation Program**

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The Weather-Ready Nation (WRN) Ambassador initiative is NOAA's effort to formally recognize NOAA partners who are improving the nation's readiness, responsiveness, and overall resilience against extreme weather, water, and climate events. As a WRN Ambassador, partners commit to working with NOAA and other Ambassadors to strengthen national resilience against extreme weather. In effect, the WRN Ambassador initiative helps unify the efforts across government, non-profits, academia, and private industry toward making the nation more ready, responsive, and resilient against extreme environmental hazards. WRN is a strategic outcome where society's response should be equal to the risk from all extreme weather, water, and climate hazards.

WRN Ambassadors serve a pivotal role in affecting societal change — helping to build a nation that is ready, responsive, and resilient to the impacts of extreme weather and water events.

To be officially recognized as a WRN Ambassador, an organization must commit to:

1. Promoting Weather-Ready Nation messages and themes to their stakeholders;
2. Engaging with NOAA personnel on potential collaboration opportunities;
3. Sharing their success stories of preparedness and resiliency; and,
4. Serving as an example by educating employees on workplace preparedness.

### **5.4.3 Fiscal Capabilities**

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Mitigation projects and initiatives are largely or entirely dependent on available funding. Lincoln County is able to fund mitigation projects through existing local budgets, local appropriations (including referendums and bonding), and through a myriad of Federal and State loan and grant programs. A number of these funding opportunities are described below.

#### **FEMA Hazard Mitigation Funding Opportunities**

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Federal mitigation grant funding is available to all communities with a current hazard mitigation plan (this plan); however most of these grants require a "local share" in the range of 10-25 percent of the total grant amount. The FEMA mitigation grant programs are described below.



**FEMA, 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. Projects must fit into an overall mitigation strategy for the area identified as part of a local planning effort. All applicants must have a FEMA-approved Hazard Mitigation Plan (this plan).

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.

**Flood Mitigation Assistance (FMA) Program.** The FMA combines the previous Repetitive Flood Claims and Severe Repetitive Loss Grants into one 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. At minimum, a FEMA-approved local flood mitigation plan is required before a project can be approved. FMA funds are distributed from FEMA to the state. Montana DES serves as the grantee and program administrator for FMA.

**FEMA, Pre-Disaster Mitigation Competitive (PDMC) Grant Program.** The PDM program is an annually funded, nationwide, competitive grant program. No disaster declaration is required. Federal funds will cover 75 percent of a project's cost up to \$3 million. As with the HMGP and FMA, a FEMA-approved local hazard mitigation plan is required to be approved for funding under the PDM program.

**FEMA, Fire Management Assistance Grant (FMAG) Program.** Fire Management Assistance is available to States, local and tribal governments, for the mitigation, management, and control of fires on publicly or privately-owned forests or grasslands, which threaten such destruction as would constitute a major disaster. The Fire Management Assistance declaration process is initiated when a State submits a request for assistance to the FEMA Regional Director at the time a "threat of major disaster" exists. The entire process is accomplished on an expedited basis and a FEMA decision is rendered in a matter of hours. The FMAG Program provides a 75 percent Federal cost share and the State pays the remaining 25 percent for actual costs. Before a grant can be awarded, a State must



demonstrate that total eligible costs for the declared fire meet or exceed either the individual fire cost threshold - which applies to single fires, or the cumulative fire cost threshold, which recognizes numerous smaller fires burning throughout a State. Eligible firefighting costs may include expenses for field camps; equipment use, repair and replacement; tools, materials and supplies; and mobilization and demobilization activities.

**FEMA, Readiness, Response and Recovery Directorate, Fire Management Assistance Grant Program.**

This 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.

**Fire Prevention and Safety Grants.** The Fire Prevention and Safety Grants (FP&S) are part of the Assistance to Firefighters Grants, and are administered by the FEMA. 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. More information: <https://www.fema.gov/welcome-assistance-firefighters-grant-program>

**Other Mitigation Funding Opportunities**

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.

**U.S. Army Corps of Engineers (USACE) Section 205 Program.** Section 205 of the Flood Control Act of 1948, as amended, provides authority for the USACE to construct projects (either structural or nonstructural) to reduce damages caused by flooding. This authority focuses on solving local flood problems in urban areas, towns and communities. Under the Section 205 Program, the USACE can provide for local protection from flooding by the construction or improvement of flood control works. The types of studies and/or projects, which are tailored to be site specific, are either structural or nonstructural. Structural projects include levees, channel improvements, small dams and floodwalls. Nonstructural measures reduce flood damages by changing the use of floodplains or by accommodating existing uses to the flood hazard. Examples include flood proofing, relocation of structures, and flood warning and preparedness systems. The USACE oversees planning, design, and construction of flood risk management projects in close coordination with the project sponsor. Before the federal government can participate in implementing a Section 205 project, a planning study must be conducted to determine if the project is economically justified (benefits exceed the costs), technically feasible, and environmentally acceptable.

The feasibility study is initially 100 percent federally-funded up to \$100,000. Any study costs over \$100,000 are cost shared 50-50 between the USACE and the local sponsor. The sponsor's 50 percent can consist of any combination of cash and in-kind services. Once the feasibility study is complete, the remaining project cost is shared 65 percent federal and 35 percent non-federal. The sponsor's 35



percent share (minimum 5 percent cash) of the total project implementation cost consists of cash and Lands, Easements, Rights-of-way, Relocations, and Disposal areas (LERRDs) necessary for project construction. If the value of the LERRDs plus the minimum 5 percent cash contribution does not equal or exceed 35 percent of the project cost, the sponsor must pay the additional amount necessary so that the sponsor's total contribution equals 35 percent of the project cost. The federal investment in the solution is limited to a maximum of \$10 million per project.

**USACE Section 22 Program.** Section 22 of the Water Resources Development Act of 1974, as amended, provides authority for the USACE to assist states, local governments, federally-recognized Indian Tribes and other non-federal entities in the preparation of comprehensive plans for the development, utilization and conservation of water and related land resources. Under the Section 22 Program, the USACE can provide technical planning assistance in all areas related to water resources development. Typical studies are only planning level of detail; they do not include detailed design for project construction. The studies generally involve the analysis of existing data for planning purposes using standard engineering techniques, although some data collection is often necessary. Most studies become the basis for state, tribal, or local planning decisions. The program can encompass many types of studies dealing with water resource issues including: flood damage reduction studies, bank stabilization studies, water quality studies, and sedimentation studies.

Section 22 is funded annually by Congress. Assistance is limited to \$500,000 in federal funds per state or Tribe per year. Individual studies, of which there may be more than one per state or Tribe per year, generally range in cost from \$25,000 to over \$100,000. These studies are cost-shared on a 50/50 basis (50 percent federal/50 percent non-federal sponsor). The study sponsor has the option of providing in-kind services for up to 100 percent of its share of the study cost.

**National Fire Plan 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. More information: <http://www.federalgrantswire.com/wildland-urban-interface-community-and-rural-fire-assistance.html#.WCx8ekYzWUk>

**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. More information: [http://www.fs.usda.gov/wps/portal/fsinternet!/ut/p/c4/04\\_SB8K8xLLM9MSSzPy8xBz9CP0os3gJAwhwtDDw9\\_AI8zPwhQoY6BdkOyoCAPkATIA!/?ss=119985&navtype=BROWSEBYSUBJECT&cid=FE\\_003853&navid=091000000000000&pnavid=null&position=BROWSEBYSUBJECT&ttype=main&pname=Secure%20Rural%20Schools-%20Home](http://www.fs.usda.gov/wps/portal/fsinternet!/ut/p/c4/04_SB8K8xLLM9MSSzPy8xBz9CP0os3gJAwhwtDDw9_AI8zPwhQoY6BdkOyoCAPkATIA!/?ss=119985&navtype=BROWSEBYSUBJECT&cid=FE_003853&navid=091000000000000&pnavid=null&position=BROWSEBYSUBJECT&ttype=main&pname=Secure%20Rural%20Schools-%20Home)

**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](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: [http://www.blm.gov/nifc/st/en/prog/fire/community\\_assistance.html](http://www.blm.gov/nifc/st/en/prog/fire/community_assistance.html)

**Fire Management Assistance Program.** This program is authorized under Section 420 of the Stafford Act. It allows for the mitigation, management, and control of fires burning on publicly or privately owned forest or grasslands that threaten destruction that would constitute a major disaster. More information: <http://www.fema.gov/fire-management-assistance-grant-program>

**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](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. More information: <http://www.dhs.gov/>

**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, a 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: <http://www.hud.gov/offices/cpd/communitydevelopment/programs/>

**Volunteer Fire Assistance Program Grants.** 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>

**Western States Wildland Urban Interface.** National Fire Plan funds are available to mitigate risk from wildland fire within the WUI. Funds are awarded through a competitive process to 22 western states and territories through the Western Wildland Urban Interface Grant Program. Each year, the Montana Department of Natural Resources and Conservation accepts proposals from partners around the state for submission to the National Fire Plan competitive process. The State scores and prioritizes these proposals before sending them on to the national competitive process. Non-profit organizations, conservation districts, county and municipal governments, and fire departments. Individual landowners may not apply but may be eligible for cost-share opportunities through this program. Each grant request is limited to a maximum of \$300,000. 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>

## **5.5 Mitigation Strategy Development**

This subsection discusses the identification, prioritization, analysis and implementation plan of mitigation actions for Lincoln County and the communities of Libby, Troy, and Eureka.

### **5.5.1 Mitigation Strategy Update and Reconciliation**

The Planning Team reviewed the list of mitigation actions (projects) from the 2011 PDM Plan and determined which were complete, should be deleted, or reworded for the 2018 mitigation strategy during weekly Planning Team conference calls held during October 2018. **Appendix D** presents a reconciliation of mitigation projects and their status.

Concerted efforts were made to assure that the county develop mitigation strategies that included activities and initiatives covering the range of mitigation action types described in FEMA planning guidance (FEMA “Local Mitigation Planning Handbook” March 2013), specifically:

1. Prevention Projects – These actions include governmental regulatory authorities, including policies or codes that influence the way land and buildings are being developed and built.
2. Property Protection Projects – Actions that involve the modification of existing buildings or structures to protect them from a hazard, or removal from the hazard area. Examples include acquisition, elevation, relocations, structural retrofits, storm shutters, and shatter-resistant glass. Wildland fuel reduction projects are also included in this category.
3. Structural Projects - These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce the impact of hazards.
4. Natural Resource Protection Projects – These are actions that minimize damage and losses, and also preserve or restore the functions of natural systems.
5. Education and Awareness Programs – These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as the National Flood Insurance Program and Community Rating System, StormReady (NOAA) and FireWise (NFPA) Communities.
6. Emergency Service Projects – These are actions to enhance community preparedness through training and acquisition of equipment.



7. Mapping/Analysis/Planning Projects – These actions include development of mapping and planning documents to assist with implementation of mitigation strategies.

In consideration of federal and state mitigation guidance, the MHMP Planning Team recognized that all communities would benefit from the inclusion of certain mitigation actions. These include initiatives to address vulnerable public and private properties, including repetitive loss properties; initiatives to support continued and enhanced participation in the NFIP; improved public education and awareness programs; and initiatives to support county-wide and regional efforts to build greater local mitigation capabilities.

Mitigation actions included in the 2018 Lincoln County mitigation strategy are presented in **Table 5.5-2** at the end of this Section. **Appendix D** contains a mitigation action plan with individual project worksheets.

### 5.5.2 Mitigation Strategy Benefit/Cost Review and Prioritization

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Each of the proposed mitigation actions has value; however, time and financial constraints do not permit all projects to be implemented immediately. By prioritizing the actions, the most critical, cost effective projects can be achieved in the short term. Mitigation actions retained and developed for this updated MHMP were re-prioritized to reflect current conditions and anticipated needs over the next five years.

Section 201.6.c.3iii of 44CFR requires the prioritization of the action plan to emphasize the extent to which benefits are maximized according to a cost/benefit review of the proposed projects and their associated costs. Stated otherwise, cost-effectiveness is one of the criteria that must be applied during the evaluation and prioritization of all actions comprising the overall mitigation strategy.

The benefit/cost review used for the evaluation and prioritization of projects in this plan was qualitative; i.e. it does not include the level of detail required by FEMA for project grant eligibility under the HMGP and PDMC grant program.

1. **Costs** are the total cost for the action or project, and may include administrative costs, construction costs (including engineering, design and permitting), and maintenance costs.
2. **Benefits** are the savings from losses avoided attributed to the implementation of the project, and may include life-safety, structure and infrastructure damages, loss of service or function, and economic and environmental damage and losses.

When available, jurisdictions were asked to identify the actual or estimated dollar value for project costs and associated benefits. Having defined costs and benefits allows a direct comparison of benefits versus costs, and a quantitative evaluation of project cost-effectiveness. Often, however, numerical costs and/or benefits have not been identified or may be impossible to quantitatively assess.

For the purposes of this planning process, 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 Impacted*, *Property Impacted*, *Project Feasibility* and *Cost*, as described below:

1. For the *Population Protected* category, a “high” rank represents greater than 50 percent of county residents would be protected by implementation of the mitigation strategy; a





- “medium” rank represents 20 to 50 percent of county residents would be protected; and, a “low” rank represents less than 20 percent of county residents would be protected.
2. For the *Property Protected* category, a “high” represents that greater than \$500,000 worth of property would be protected through implementation of the mitigation strategy; “medium” represents that \$100,000 to \$500,000 worth of property would be protected; and, “low” would be less than \$100,000 would be protected.
  3. For the *Project Feasibility* category a “high” rank represents that technology is available and implementation is likely; a “medium” rank indicates technology may be available but implementation could be difficult; and, a “low” rank represents that no technology is available or implementation would be unlikely.
  4. For the *Project Cost* category, a “high” represents that the mitigation project would cost more than \$500,000; a “medium” rank represents the project cost would be between \$100,000 and \$500,000; and, “low” represents the project would cost less than \$100,000.

The overall cost-benefit was then calculated by summing the total score for each project. **Table 5.5-1** presents the cost-benefit scoring matrix. The mitigation action plans in **Appendix D** present the scoring of each project.

**Table 5.5-1. Cost-Benefit Scoring Matrix**

Score	Population Protected	Property Protected	Project Feasibility	Cost
High	3	3	3	1
Medium	2	2	2	2
Low	1	1	1	3

After considering all mitigation projects, the MHMP Planning Team prioritized the projects as high, medium, or low based on which projects were most needed to protect life and property. Prioritization of the projects serves as a guide for choosing and funding projects. **Table 5.5-2** presents the county priority for each project.

### 5.5.3 Project Implementation

The MHMP Planning Team reviewed the projects and assigned a corresponding county, city department responsible for its implementation. Cooperating organizations for implementation may also include local, federal or regional agencies that are capable of implementing activities and programs. The Planning Team identified a schedule for implementation and potential funding sources. The schedule for implementation included several categories including: “ongoing” for projects that are part of the county’s emergency management program; “short-term” for projects to be completed within 1-2 years; “mid-term” for projects to be completed within 3-4 years; and, “long-term” for projects to be completed in 5 or more years.

Implementation details are shown in **Table 5.5-3** and in the mitigation action plans in **Appendix D**. Lincoln County EMA will be responsible for mitigation project administration.



Table 5.5-2. Lincoln County 2018 Mitigation Strategy

Goal	Objective	Project	Hazard	Jurisdiction	Benefit-Cost Ranking/Score	County Priority
Goal 1 - Reduce Impacts from Wildfire	<i>Objective 1.1 - Implement Actions to Prevent Impacts from Wildfire</i>	1.1.1 - Promote fuel mitigation projects in OU3 and Modified Fire Response Zone.	Wildfire	County, Libby	Medium / 9	High
		1.1.2 - Encourage Lincoln County to identify specific areas within the county to become FireWise communities.	Wildfire	County, Troy, Eureka	High / 11	Medium
		1.1.3 - Ensure that water supply requirements in County Subdivision Regulations are met.	Wildfire	County	High / 10	High
	<i>Objective 1.2 - Enhance Opportunities to Protect Property from Wildfire</i>	1.2.1 - Encourage fuel reduction and control activities, such as thinning and fire breaks, particularly in WUI and municipal watersheds.	Wildfire	County, Libby, Troy, Rexford	High / 12	High
		1.2.2 - Provide fire protection to the roof of the Elementary School through either non-flammable roofing or roof top sprinkling system	Wildfire	Libby	High / 12	High
	<i>Objective 1.3 - Enhance Emergency Service Capabilities to Mitigate Impacts from Wildfire</i>	1.3.1 - Complete fuel mitigation along evacuation routes.	Wildfire	County	High / 10	High
		1.3.2 - Improve fire agency infrastructure (training facility, additional fire suppression equipment and storage, enhanced communications systems).	Wildfire	County, Libby, Troy, Eureka, Rexford	High / 10	High
		1.3.3 - Develop shared database between fire suppression agencies on road closures, water sources, fuel ratings, district boundaries, and ignition hazards.	Wildfire	County, Libby, Troy, Eureka, Rexford	High / 10	Medium
		1.3.4 - Develop water storage capacity and water supply sites to enhance firefighting capability.	Wildfire	County, Libby, Troy, Eureka, Rexford	High / 11	Medium
		1.3.5 - Acquire specialized equipment for firefighting in OU3 and Modified Fire Response Zone.	Wildfire	County, Libby	Medium / 7	High
		1.3.6 - Provide training for firefighters and emergency service personnel on wildfire response in OU3 and Modified Fire Response Zone.	Wildfire	County, Libby	Medium / 9	High
		1.3.7 - Identify boundaries of OU3 through signs, monuments, or other permanent markers.	Wildfire	County	Medium / 8	High
	<i>Objective 1.4 - Provide Public Education and Awareness on Wildfire</i>	1.4.1 - Educate landowners about alternatives to burning slash (i.e. chipping, community landfill, etc.).	Wildfire	County, Libby, Troy, Eureka, Rexford	Medium / 9	Medium
		1.4.2 - Promote FireWise education efforts in communities and schools.	Wildfire	County, Libby, Troy, Eureka, Rexford	High / 12	High
		1.4.3 - Educate public on the hazard and how to protect their health if larger wildfire occurs in OU3.	Wildfire	County, Libby	Medium / 9	High
	<i>Objective 1.5 - Implement Planning, Analysis, and Mapping Projects to Reduce Impacts from Wildfire</i>	1.5.1 - Develop a database of property assessments and completed fuel mitigation projects.	Wildfire	County	Medium / 8	Medium
		1.5.2 - Review and update evacuation plans.	Wildfire	County	High / 10	High
		1.5.3 - Risk rate the fire hazard for all WUI areas in the County.	Wildfire	County, Troy, Rexford	High / 11	High
		1.5.4 - Update Lincoln County Community Wildfire Protection Plan.	Wildfire	County, Libby, Troy, Eureka, Rexford	High / 12	High



Table 5.5-2. Lincoln County 2018 Mitigation Strategy

Goal	Objective	Project	Hazard	Jurisdiction	Benefit-Cost Ranking/Score	County Priority
Goal 2 - Reduce Impacts from Haz-Mat Incidents & Transportation Accidents	<i>Objective 2.1 - Enhance Emergency Service Capabilities to Mitigate Impacts from Haz-Mat Incidents and Transportation Accidents</i>	2.1.1 - Ensure local emergency responders have adequate training to respond to hazardous material events consistent with local capabilities.	Haz-Mat & Transportation Accidents	County, Libby, Troy, Eureka, Rexford	High / 11	High
		2.1.2 - Obtain supply of Class B foam for haz-mat response.	Haz-Mat & Transportation Accidents	County, Libby, Troy	High / 10	High
	<i>Objective 2.2 - Provide Public Education and Awareness on Haz-Mat Incidents and Transportation Accidents</i>	2.2.1 - Educate student transportation drivers on basic haz-mat info and what to do in a situation.	Haz-Mat & Transportation Accidents	County, Libby, Troy, Eureka, Rexford	Medium / 9	High
	<i>Objective 2.3 - Implement Planning, Analysis, and Mapping Projects to Reduce Impacts from Haz-Mat Incidents and Transportation Accidents</i>	2.3.1 - Encourage medical and care facilities to develop, review and/or update their haz-mat plans and conduct drills to exercise their response protocol.	Haz-Mat & Transportation Accidents	County, Libby, Troy, Eureka	Medium / 8	High
		2.3.2 - Conduct response pre-planning by identifying access roads and staging areas to get to railroad including a map with mile markers.	Haz-Mat & Transportation Accidents	County, Libby, Troy	High / 10	High
Goal 3 - Reduce Impacts from Flooding	<i>Objective 3.1 - Enhance Opportunities to Protect Property from Flooding</i>	3.1.1 - Reduce stream bed load in Flower Creek.	Flooding	Libby	Medium / 9	High
		3.1.2 - Conduct an engineering study to make recommendations for bank stabilization and rerouting of Libby Creek that threatens critical infrastructure along Farm to Market Road.	Flooding	County	Medium / 9	Medium
	<i>Objective 3.2 - Implement Structural Projects to Reduce Impact of Flooding</i>	3.2.1 - Replace culverts with bridges to mitigate impacts of runoff.	Flooding	County, Libby, Troy, Eureka	Medium / 9	High
		3.2.2 - Resize and upgrade culverts as needed throughout the county.	Flooding	County, Libby, Troy, Eureka	High / 10	High
		3.2.3 - Maintain and expand Libby storm drainage system, as needed.	Flooding	Libby	Medium / 8	High
		3.2.4 - Improve roads and road drainage to withstand flood flows in selected areas.	Flooding	County, Libby, Troy, Eureka	High / 10	High
		3.2.5 - Replace the Balsam Bridge over Flower Creek (bridge is bottle neck for ice causing creek to overflow and flood Libby).	Flooding	Libby	Medium / 8	Low
		3.2.6 - Build and maintain levees to prevent water from overflowing banks of streams along Libby and Flower Creeks.	Flooding	County, Libby	High / 10	Medium
		3.2.7 - Expand storm drainage system in Eureka.	Flooding	Eureka	High / 10	Medium
	Goal 3 - Reduce Impacts from Flooding	<i>Objective 3.3 - Provide Public Education and Awareness on Flooding</i>	3.3.1 - Educate homeowners on the advantages of purchasing flood insurance through the National Flood Insurance Program.	Flooding	County, Libby, Troy, Eureka	High / 10
3.3.2 - Work towards getting Lincoln County into the National Flood Insurance Program Community Rating System.			Flooding	County	Medium / 7	Low



Table 5.5-2. Lincoln County 2018 Mitigation Strategy

Goal	Objective	Project	Hazard	Jurisdiction	Benefit-Cost Ranking/Score	County Priority
		3.3.3 - Obtain and disseminate revised floodplain mapping to increase knowledge of flood prone areas.	Flooding	County, Libby, Troy, Eureka	Medium / 9	Medium
		3.3.4 - Promote public awareness on protecting private property from flooding.	Flooding	County, Libby, Troy, Eureka	High / 11	High
	<i>Objective 3.4 - Implement Planning, Analysis, and Mapping Projects to Reduce Impacts from Flooding</i>	3.4.1 - Improve floodplain mapping throughout Lincoln County.	Flooding	County, Eureka	Medium / 8	High
	<i>Objective 3.5 - Implement Prevention Projects to Reduce Impacts from Flooding</i>	3.5.1 - Update floodplain regulations to meet minimum standards established by FEMA and State.	Flooding	County, Libby, Troy, Eureka	Medium / 9	High
Goal 4 - Reduce Impacts from Disease	<i>Objective 4.1 - Promote Activities to Minimize Disease Outbreaks and Impacts</i>	4.1.1 - Continue to provide Public Health surveillance, disease investigations, and vaccination clinics.	Disease	County, Libby, Troy, Eureka, Rexford	High / 10	High
	<i>Objective 4.2 - Provide Public Education and Awareness on Disease</i>	4.2.1 - Continue Public Health education on disease prevention, sanitation and healthy living.	Disease	County, Libby, Troy, Eureka, Rexford	High / 10	High
	<i>Objective 4.3 - Enhance Emergency Service Capabilities to Mitigate Impacts from Disease</i>	4.3.1 - Collaborate with community partners to train and exercise public health emergency response plans.	Disease	County, Libby, Troy, Eureka, Rexford	High / 10	High
		4.3.2 - Collaborate and coordinate with community partners to review and update public health emergency response plans annually.	Disease	County, Libby, Troy, Eureka, Rexford	High / 10	High
Goal 5 - Reduce Impacts from Workplace Violence/Active Shooter Incidents	<i>Objective 5.1 - Provide Public Education and Awareness on Workplace Violence / Active Shooter Incidents</i>	5.1.1 - Implement national campaigns throughout communities on active shooter awareness and preparedness.	Workplace Violence/Active Shooter Incidents	County, Libby, Troy, Eureka, Rexford	High / 10	High
	<i>Objective 5.2 - Enhance Emergency Service Capabilities to Mitigate Impacts from Workplace Violence / Active Shooter Incidents</i>	5.2.1 - Ensure that all law enforcement, first responders, and school staff within the County have active shooter training.	Workplace Violence/Active Shooter Incidents	County, Libby, Troy, Eureka, Rexford	High / 10	High
	<i>Objective 5.3 - Enhance Opportunities to Protect Property from Workplace Violence / Active Shooter Incidents</i>	5.3.1 - Perform vulnerability assessments at critical facilities to determine ways for physical hardening.	Workplace Violence/Active Shooter Incidents	County, Libby, Troy, Eureka, Rexford	High / 11	High
Goal 6 - Reduce Impacts from Severe Weather	<i>Objective 6.1 - Provide Public Education and Awareness on Severe Weather</i>	6.1.1 - Promote community outreach on winter weather survival.	Severe Weather	County, Libby, Troy, Eureka, Rexford	High / 11	High
		6.1.2 - Consider becoming an ambassador to the NWS Weather Ready Nation initiative.	Severe Weather	County, Libby, Troy, Eureka, Rexford	High / 11	Medium
Goal 7 - Reduce Impacts from Terrorism, Civil Unrest & Cyber Security	<i>Objective 7.1 - Enhance Emergency Service Capabilities to Mitigate Impacts from Terrorism, Civil Unrest &amp; Cyber Security</i>	7.1.1 - Procure equipment and train to reduce impacts from terrorism, civil unrest, and cyber security.	Terrorism, Civil Unrest & Cyber Security	County, Libby, Troy, Eureka, Rexford	High / 10	High



Table 5.5-2. Lincoln County 2018 Mitigation Strategy

Goal	Objective	Project	Hazard	Jurisdiction	Benefit-Cost Ranking/Score	County Priority
	Objective 7.2 - Provide Public Education and Awareness on Terrorism, Civil Unrest & Cyber Security	7.2.1 - Continue orientation with new employees and ongoing training with existing staff on cyber security.	Terrorism, Civil Unrest & Cyber Security	County, Libby, Troy, Eureka	High / 10	High
	Objective 7.3 - Implement Planning, Analysis, and Mapping Projects to Reduce Impacts from Terrorism, Civil Unrest & Cyber Security	7.3.1 - Keep apprised of regional scams and organization hacking, conduct local threat assessment, and communicate, as appropriate.	Terrorism, Civil Unrest & Cyber Security	County, Libby, Troy, Eureka	High / 11	High
		7.3.2 - Continue assessments of critical cyber infrastructure including fire walls and networks.	Terrorism, Civil Unrest & Cyber Security	County	High / 11	High
		7.3.3 - Continue to perform vulnerability assessments on critical facilities.	Terrorism, Civil Unrest & Cyber Security	County, Libby, Troy, Eureka	High / 11	High
Goal 8 - Reduce Impacts from Dam Failure	Objective 8.1 - Enhance Emergency Service Capabilities to Mitigate Impacts from Dam Failure	8.1.1 - Continue to exercise high-hazard dams.	Dam Failure	County, Libby, Troy, Eureka	High / 12	High
Goal 9 - Reduce Impacts from All Hazards	Objective 9.1 - Enhance Emergency Service Capabilities to Mitigate Impacts from All-Hazards	9.1.1 - Obtain additional repeaters for County to improve emergency communications.	All Hazards	County, Libby, Troy, Eureka, Rexford	High / 10	High
		9.1.2 - Coordinate and cooperate on getting First Net in place in Lincoln County to enhance first responder communications.	All Hazards	County, Libby, Troy, Eureka, Rexford	High / 12	High
		9.1.3 - Identify and upgrade emergency shelters.	All Hazards	County, Libby, Troy, Eureka, Rexford	Medium / 8	High
		9.1.4 - Obtain generators for critical facilities including fire departments and shelters.	All Hazards	County, Libby, Troy, Eureka, Rexford	Medium / 9	High
	Objective 9.2 - Provide Public Education and Awareness on All-Hazards	9.2.1 - Provide outreach on community notification system.	All Hazards	County, Libby, Troy, Eureka, Rexford	High / 12	High
		9.2.2 - Promote preparation of household and facility Disaster Plans considering access and functional needs.	All Hazards	County, Libby, Troy, Eureka, Rexford	High / 10	High
Goal 9 - Reduce Impacts from All Hazards	Objective 9.3 - Implement Planning, Analysis, and Mapping Projects to Reduce Impacts from All-Hazards	9.3.1 - Enhance GIS data to better assist with mitigation.	All Hazards	County, Libby, Troy, Eureka, Rexford	High / 10	High
		9.3.2 - Encourage Eureka to complete a Growth Policy that considers all hazards.	All Hazards	Eureka	Medium / 9	High

Notes: BNSF = Burlington Northern Santa Fe; DHS = U.S. Department of Homeland Security; DNRC = Montana Department of Natural Resources and Conservation; GIS = Geographic Information System; LEPC = Local Emergency Management Committee; LiDAR = Light Detection and Ranging; MDT = Montana Department of Transportation; MFRZ = Modified Fire Response Zone; MOA = Memorandum of Agreement; NWS = National Weather Service; OU3 = Operable Unit 3; WUI = Wildland Urban Interface



Table 5.5-3. Lincoln County 2018 Mitigation Strategy – Implementation Details

Project	Jurisdiction	Responsible Agency / Department	Progress Made	Planned Activities	Schedule	Potential Funding Source
<b>WILDFIRE MITIGATION PROJECTS</b>						
1.1.1 - Promote fuel mitigation projects in OU3 and Modified Fire Response Zone.	County, Libby	USFS, W.R. Grace	W.R. Grace has completed fuel reduction and fire breaks in OU3. USFS has completed fuel reduction in MFRZ.	USFS planning additional projects in MFRZ.	Ongoing	USFS, W.R. Grace
1.1.2 - Encourage Lincoln County to identify specific areas within the county to become FireWise communities.	County, Troy, Eureka	Lincoln County FireSafe Council	McCormick achieved FireWise Community status and Bull Lake and Chain-of-Lakes all working on this.	Identify and divide Libby area into smaller communities. Identify key individuals to spearhead FireWise efforts in the communities.	Ongoing	County resources, grants
1.1.3 - Ensure that water supply requirements in County Subdivision Regulations are met.	County	Planning Dept., Commissioners	New project for 2018 Plan.	Create mechanism so final plats are not approved until water supply requirements are met. Require inspection by VFDs.	Short-term	County resources
1.2.1 - Encourage fuel reduction and control activities, such as thinning and fire breaks, particularly in WUI and municipal watersheds.	County, Libby, Troy, Rexford	Lincoln County FireSafe Council	Landowner grant fuel reduction projects have been successful. All USFS planning projects have incorporated fuel reduction.	Encourage USFS and private treatment of areas in or near WUI including Em Kayan highway corridor, Skidale/ Parmenter, Woodland Heights, West Kootenai area, and others.	Ongoing	USFS, DNRC, County resources
1.2.2 - Provide fire protection to the roof of the Elementary School through either non-flammable roofing or roof top sprinkling system.	Libby	School District	New project for 2018 Plan.	Identify funding. Consider feasibility of alternatives. Implement.	Mid-term	School District
1.3.1 - Complete fuel mitigation along evacuation routes.	County	Lincoln County FireSafe Council	West Kootenai Road has been thinned by USFS. Highway to McCormick has been done. Pipe Creek. Upper Yaak done with recent fires. Shaded fire breaks created in Therriault Lake and Vermillion areas.	Improve egress from Em Kayan, Kooconusa Marina, Woodland Heights, and others. Request that MDT consider projects along Highways 37 and 56. Identify and treat wildfire evacuation routes on county roads.	Ongoing	USFS, State, County resources
1.3.2 - Improve fire agency infrastructure (training facility, additional fire suppression equipment and storage, enhanced communications systems).	County, Libby, Troy, Eureka, Rexford	USFS, W.R. Grace	USFS has been trained and equipped for OU3 fires including new decontam-ination trailer. New fire substations completed including River Rd. in Libby, Savage Lake and Kootenai Vista in Troy. Improved equipment and training across all districts. W. Kootenai has new repeater. Improvements made in Yaak.	Proposed substation in McCormick area. More work planned at Bull Lake station. MT Highway Patrol and U.S. Border Patrol to continue support for Sheriff's Office as assisting agencies.	Ongoing	USFS, DNRC, County resources



Table 5.5-3. Lincoln County 2018 Mitigation Strategy – Implementation Details

Project	Jurisdiction	Responsible Agency / Department	Progress Made	Planned Activities	Schedule	Potential Funding Source
1.3.3 - Develop shared database between fire suppression agencies on road closures, water sources, fuel ratings, district boundaries, and ignition hazards.	County, Libby, Troy, Eureka, Rexford	Lincoln Co. Fire Co-op, EMA	Libby Rural Fire has this in GIS system.	Meet with Fire Co-op to develop protocol for developing information. Obtain data from individual districts and combine into one database.	Ongoing	County resources
1.3.4 - Develop water storage capacity and water supply sites to enhance firefighting capability.	County, Libby, Troy, Eureka, Rexford	Lincoln Co. Fire Co-op, USFS, DNRC, County Forester, MDT	Storage tank put in at airport. High volume capacity pumping station put in at Bull Lake. W. Kootenai has gravity feed water fill site tied into irrigation.	Develop water supply for McCormick area and others as needed.	Ongoing	USFS, DNRC, FEMA, Private Developers
1.3.5 - Acquire specialized equipment for firefighting in OU3 and Modified Fire Response Zone.	County, Libby	Lincoln Co. Fire Co-op	Obtained PPE, decontamination trailer, and contract helicopter.	As additional equipment needs are identified will be acquired.	Ongoing	USFS, DNRC, grants
1.3.6 - Provide training for firefighters and emergency service personnel on wildfire response in OU3 and Modified Fire Response Zone.	County, Libby	Lincoln Co. Fire Co-op, USFS, W.R. Grace	USFS has specially trained units. Initial and ongoing training is provided. Awareness on OU3 is incorporated in standard firefighter training.	Continue same.	Ongoing	USFS, DNRC, grants
1.3.7 - Identify boundaries of OU3 through signs, monuments, or other permanent markers.	County	Lincoln County FireSafe Council	New project for 2018 Plan.	Install signage on Rainy Creek, along Hwy 37, Em Kayan Subdivision, and other areas as needed.	Short-term	USFS
1.4.1 - Educate landowners about alternatives to burning slash (i.e. chipping, community landfill, etc.).	County, Libby, Troy, Eureka, Rexford	Lincoln FireSafe Council, County Health Dept.	In Libby, free chipping of slash piles was offered in order to reduce burning. Cost incentives were also offered for the removal of biomass in lieu of burning. The saw log and pulp market helped remove unwanted slash and biomass.	Continue same.	Ongoing	County resources
1.4.2 - Promote FireWise education efforts in communities and schools.	County, Libby, Troy, Eureka, Rexford	County Forester, Lincoln FireSafe Council	Numerous presentations made by County Forester and DNRC. FireSafe Council sponsors monthly FireWise messages in newspapers during fire season. Numerous educational programs ongoing in the schools. May is wildfire preparedness month with county proclamation, newspaper articles and radio announcements on FireWise Program. FireWise Trailer used as educational tool at county-wide events. New Lincoln County FireWise website launched in 2012.	Conduct meetings for Parmenter Face/Skidale fuel reduction projects. Participate in Fire Prevention Week with FireWise education. Continue same.	Ongoing	County resources



Table 5.5-3. Lincoln County 2018 Mitigation Strategy – Implementation Details

Project	Jurisdiction	Responsible Agency / Department	Progress Made	Planned Activities	Schedule	Potential Funding Source
1.4.3 - Educate public on the hazard and how to protect their health if larger wildfire occurs in OU3.	County, Libby	Lincoln Co. Health Dept., EMA	Health Dept. does outreach through press releases and social media.	Participate in the annual Libby Health Fair – OU3, and wildfire air quality.	Ongoing	County resources
1.5.1 - Develop a database of property assessments and completed fuel mitigation projects.	County	Lincoln County FireSafe Council	New project for 2018 Plan.	Get layers from agencies and compile. Identify and train GIS staff.	Ongoing	County resources, grants
1.5.2 - Review and update evacuation plans.	County	County Sheriff, EMA	New project for 2018 Plan.	Compile what's been provided by VFDs. Meet with County Fire Co-op. Prepare plan.	Mid-term	County resources
1.5.3 - Risk rate the fire hazard for all WUI areas in County.	County, Troy, Rexford	USFS, DNRC, County	Was completed for Libby and Eureka for CWPP update.	Complete risk rating for Troy and other communities as appropriate.	Ongoing	USFS, DNRC, County
1.5.4 - Update Lincoln County Community Wildfire Protection Plan.	County, Libby, Troy, Eureka, Rexford	Lincoln County.	New project for 2018 Plan.	Update WUI mapping, forest assessments, and fuel mitigation projects to include in CWPP update.	Mid-term	County resources
<b>HAZ-MAT INCIDENT &amp; TRANSPORTATION ACCIDENT MITIGATION PROJECTS</b>						
2.1.1 - Ensure local emergency responders have adequate training to respond to hazardous material events consistent with local capabilities.	County, Libby, Troy, Eureka, Rexford	County EMA, Individual fire dept.	Six Lincoln Co. fire members attended BNSF training in Pueblo CO on train derailments. County trains with regional haz-mat team in Kalispell.	Continue same.	Ongoing	County resources, BNSF
2.1.2 - Obtain supply of Class B foam for haz-mat response.	County, Libby, Troy	Libby Rural Fire	New project for 2018 Plan.	Determine resources available. Identify location for drop point. Acquire tote of material.	Short-term	County resources
2.2.1 - Educate student transportation drivers on basic haz-mat info and what to do in a situation.	County, Libby, Troy, Eureka, Rexford	EMA, School District	New project for 2018 Plan.	Develop haz-mat module to incorporate into existing school bus driver training.	Ongoing	County resources, transportation companies
2.3.1 - Encourage medical and care facilities to develop, review and/or update their haz-mat plans and conduct drills to exercise their response protocol.	County, Libby, Troy, Eureka	EMA, Health Dept., Hospital, Care Center	New project for 2018 Plan.	Assist with general messaging, training and drills.	Ongoing	County resources, medical and care facilities
2.3.2 - Conduct response pre-planning by identifying access roads and staging areas to get to railroad including a map with mile markers.	County, Libby, Troy	EMA, Libby Rural Fire	New project for 2018 Plan.	Obstacles. Most areas have road access. Work with BNSF.	Short-term	County resources
<b>FLOOD MITIGATION PROJECTS</b>						
3.1.1 - Reduce stream bed load in Flower Creek.	Libby	EMA, DNRC, FEMA, FWP, DEQ, Private Contractors	FWP allowed county to clean out ice. BNSF cleaned out under railroad bridge.	Highway and Rosauers bridges need to be cleared out. Bull Trout habitat makes permitting difficult. Grants needed for funding.	Long-term	FEMA grants, County and City of Libby resources
3.1.2 - Conduct an engineering study to make recommendations for bank stabilization and	County	EMA, DNRC, FEMA, FWP, DEQ, Private Contractors	None to report	Will do as needed.	Mid-term	FEMA grants, County resources





Table 5.5-3. Lincoln County 2018 Mitigation Strategy – Implementation Details

Project	Jurisdiction	Responsible Agency / Department	Progress Made	Planned Activities	Schedule	Potential Funding Source
rerouting of Libby Creek that threatens critical infrastructure along Farm to Market Road.						
3.2.1 - Replace culverts with bridges to mitigate impacts of runoff.	County, Libby, Troy, Eureka	County, Cities, Towns, USFS, DNRC	Meadow and Balsam Creek culverts upgraded. Many private approaches upgraded with culverts.	Culvert upgrade planned on Education Way. Others as needed.	Ongoing	FEMA grants, County, City, Town resources
3.2.2 - Resize and upgrade culverts as needed throughout the county.	County, Libby, Troy, Eureka	County, Cities, Towns, USFS, DNRC	Stormwater basins that discharge to river have been cleaned out.	Dredge out stormwater basins, as needed. Add to system to accommodate future development.	Ongoing	FEMA grants, County, City, Town resources, USFS
3.2.3 - Maintain and expand Libby storm drainage system, as needed.	Libby	City of Libby, MDT	Stream banks reinforced with armoring at Hammer Cutoff, Libby Creek, Cherry/Granite Creek Roads.	Continue same.	Ongoing	City of Libby resources, MDT, CDBG
3.2.4 - Improve roads and road drainage to withstand flood flows in selected areas.	County, Libby, Troy, Eureka	City of Libby, MDT	No progress to report.	Elevate bridge in lieu of reducing bedload. Pursue grant options for funding.	Ongoing	County, City and Town resources, MDT, FEMA grants
3.2.5 - Replace the Balsam Bridge over Flower Creek (bridge is bottle neck for ice causing creek to overflow and flood Libby).	Libby	County, City of Libby, EMA, DNRC, USACE, FWP, DEQ	Levee maintenance done including clearing off vegetation and improving access.	Continue maintenance. Identify where levees needed and coordinate with permitting agencies.	Long-term	FEMA grants, City of Libby resources
3.2.6 - Build and maintain levees to prevent water from overflowing banks of streams along Libby and Flower Creeks.	County, Libby	County, City of Libby, EMA, DNRC, USACE, FWP, DEQ	None to report	Will do as needed.	Ongoing	County and City of Libby resources
3.2.7 - Expand storm drainage system in Eureka.	Eureka	Eureka Pabic Works	New project for 2018 Plan.	Identify and prioritize project segments. Identify funding opportunities. Secure funding. Hire engineer to design.	Long-term	Town resources, Grants
3.3.1 - Educate homeowners on the advantages of purchasing flood insurance through the National Flood Insurance Program.	County, Libby, Troy, Eureka	Planning Depts., Floodplain Administrators, DNRC	Information has been added to county/city webpages.	Consult with homeowners as questions arise	Ongoing	County, City and Town resources
3.3.2 - Work towards getting Lincoln County into the National Flood Insurance Program Community Rating System.	County	Floodplain Administrator, FEMA	No progress to report.	Upgrade floodplain regulations as a start.	Mid-term	County resources
3.3.3 - Obtain and disseminate revised floodplain mapping to increase knowledge of flood prone areas.	County, Libby, Troy, Eureka	Floodplain Administrator, FEMA, DNRC	Information has been added to FEMA/county/city webpages.	Consult with homeowners as questions arise.	Long-term	County resources, DNRC, FEMA
3.3.4 - Promote public awareness on protecting private property from flooding.	County, Libby, Troy, Eureka	EMA, Floodplain Administrator	New project for 2018 Plan.	Utilize social media to push out info on protecting property from flooding including installing backflow valves in drains and relocating furnaces, hot water heaters, and electrical panels from flood-prone areas.	Ongoing	County resources
3.4.1 - Improve floodplain mapping throughout Lincoln County.	County, Eureka	EMA, Floodplain Administrator	New project for 2018 Plan.	Work with DNRC to acquire funding for LiDAR mapping of area creeks and rivers.	Long-term	DNRC, FEMA



Table 5.5-3. Lincoln County 2018 Mitigation Strategy – Implementation Details

Project	Jurisdiction	Responsible Agency / Department	Progress Made	Planned Activities	Schedule	Potential Funding Source
3.5.1 - Update floodplain regulations to meet minimum standards established by FEMA and State.	County, Libby, Troy, Eureka	Floodplain Administrators, Commissioners	New project for 2018 Plan.	Request assistance from DNRC. Hold public meetings. Determine protocol for compliance monitoring.	Mid-term	County and City resources
<b>DISEASE MITIGATION PROJECTS</b>						
4.1.1 - Continue to provide Public Health surveillance, disease investigations, and vaccination clinics.	County, Libby, Troy, Eureka, Rexford	County Health Dept.	New project for 2018 Plan.	Coordinate with DPHHS and local partners to continue community programs.	Ongoing	County resources
4.2.1 - Continue Public Health education on disease prevention, sanitation and healthy living.	County, Libby, Troy, Eureka, Rexford	County Health Dept.	New project for 2018 Plan.	Use social media, website, print and broadcast media to promote public health.	Ongoing	County resources
4.3.1 - Collaborate with community partners to train and exercise public health emergency response plans.	County, Libby, Troy, Eureka, Rexford	County Health Dept., EMA	New project for 2018 Plan.	Coordinate with LEPC to develop annual training and exercise schedules.	Ongoing	County resources
4.3.2 - Collaborate and coordinate with community partners to review and update public health emergency response plans annually.	County, Libby, Troy, Eureka, Rexford	County Health Dept.	New project for 2018 Plan.	Collaborate with community partners to review and update County's public health emergency response plans and coordinate with partners to update their plans annually.	Ongoing	County resources
<b>WORKPLACE VIOLENCE/ACTIVE SHOOTER INCIDENT MITIGATION PROJECTS</b>						
5.1.1 - Implement national campaigns throughout communities on active shooter awareness and preparedness.	County, Libby, Troy, Eureka, Rexford	EMA, Bull Lake VFD	New project for 2018 Plan.	Provide community outreach on Stop the Bleed and See-Something/Say-Something programs via print, broadcast, and social media to educate public on being alert and reporting suspicious behavior.	Ongoing	County resources, DHS
5.2.1 - Ensure that all law enforcement, first responders, and school staff within the County have active shooter training.	County, Libby, Troy, Eureka, Rexford	EMA, Sheriff's Office	New project for 2018 Plan.	Utilize trainers at Sheriff's office and U.S. Border Patrol to provide training to others county-wide.	Ongoing	County resources, Schools, DHS
5.3.1 - Perform vulnerability assessments at critical facilities to determine ways for physical hardening.	County, Libby, Troy, Eureka, Rexford	Law Enforcement	New project for 2018 Plan.	Utilize DHS and additional resources to perform assessments on critical facilities. Determine if grants are available to fund improvements.	Ongoing	County resources, DHS, grants
<b>SEVERE WEATHER MITIGATION PROJECTS</b>						
6.1.1 - Promote community outreach on winter weather survival.	County, Libby, Troy, Eureka, Rexford	EMA, MDT, NWS	Law enforcement reach out to special needs populations during severe winter weather.	Make available MDT guide on winter weather survival. Utilize print, broadcast and social media to educate public on how to measure snow moisture content to determine when roofs should be shoveled. Develop resource list of snow shovelers.	Ongoing	County, FEMA
6.1.2 - Consider becoming an ambassador to the NWS Weather Ready Nation initiative.	County, Libby, Troy, Eureka, Rexford	EMA, NWS	New project for 2018 Plan.	Strengthen partnerships towards building community resilience to extreme weather events. Promote WRN key messages in outreach activities.	Ongoing	County resources, NWS



Table 5.5-3. Lincoln County 2018 Mitigation Strategy – Implementation Details

Project	Jurisdiction	Responsible Agency / Department	Progress Made	Planned Activities	Schedule	Potential Funding Source
<b>TERRORISM, CIVIL UNREST &amp; CYBER SECURITY MITIGATION PROJECTS</b>						
7.1.1 - Procure equipment and train to reduce impacts from terrorism, civil unrest, and cyber security.	County, Libby, Troy, Eureka, Rexford	Law Enforcement, Fire Depts., EMS	New project for 2018 Plan.	Provide ongoing training to law enforcement, fire depts. and EMS. Identify equipment needs and funding opportunities.	Ongoing	County, Cities, Town resources, grants
7.2.1 - Continue orientation with new employees and ongoing training with existing staff on cyber security.	County, Libby, Troy, Eureka	County IT Dept., Individual IT Depts.	New project for 2018 Plan.	Develop training schedule and expand to cities and towns. Promote cyber security through ongoing messaging. Update employee handbooks annually.	Ongoing	County resources
7.3.1 - Keep apprised of regional scams and organization hacking, conduct local threat assessment, and communicate, as appropriate.	County, Libby, Troy, Eureka	Sheriff's Dept., County IT Dept.	New project for 2018 Plan.	Coordinate with MT Dept. of Justice Office of Consumer Protection and disseminate information locally.	Ongoing	County resources
7.3.2 - Continue assessments of critical cyber infrastructure including fire walls and networks.	County	County IT Dept., Private Industry	New project for 2018 Plan.	Perform system analysis on regular basis. Update equipment as needed.	Ongoing	County resources
7.3.3 - Continue to perform vulnerability assessments on critical facilities.	County, Libby, Troy, Eureka	EMA, Public Works Depts., Private industry	New project for 2018 Plan.	Utilize expertise at DHS, and other resources as needed, to inventory critical facilities. Identify funding and make appropriate updates.	Ongoing	County, Cities, Town resources
<b>DAM FAILURE MITIGATION PROJECTS</b>						
8.1.1 - Continue to exercise high-hazard dams.	County, Libby, Troy, Eureka	EMA, Dam Owners	New project for 2018 Plan.	Northern Lights/Lake Creek Dam and USACE/Libby Dam conduct exercises annually. Ensure all high-hazard dams do annual exercises.	Ongoing	Dam Owners
<b>ALL HAZARD MITIGATION PROJECTS</b>						
9.1.1 - Obtain additional repeaters for County to improve emergency communications.	County, Libby, Troy, Eureka, Rexford	EMA, Sheriff's Office	Back-up generators have been installed at repeater sites and Meadow Peak has had repeater improvements. Libby Rural Fire has improved communications. County has acquired 10 vehicle mounted repeaters.	Continue same. BPA putting in power on Calx Mountain which will improve valley communications. Lower Yaak/McCormick getting repeater.	Ongoing	County resources
9.1.2 - Coordinate and cooperate on getting First Net in place in Lincoln County to enhance first responder communications.	County, Libby, Troy, Eureka, Rexford	EMA, Bull Lake VFD	New project for 2018 Plan.	Assist, as needed, in mapping and identifying locations for cell towers.	Ongoing	State and County resources
9.1.3 - Identify and upgrade emergency shelters.	County, Libby, Troy, Eureka, Rexford	EMA, American Red Cross, Ministerial Entities	American Red Cross has identified shelter locations.	Work with partners interested in creating additional shelters that comply with national standards.	Ongoing	County, Cities, Towns resource, American Red Cross
9.1.4 - Obtain generators for critical facilities including fire departments and shelters.	County, Libby, Troy, Eureka, Rexford	EMA	Some critical facilities have been equipped with generators including Libby water treatment plant.	Create prioritized list of generator needs, apply for grants as funding available	Long-term	County, Cities, Town resources, grants



Table 5.5-3. Lincoln County 2018 Mitigation Strategy – Implementation Details

Project	Jurisdiction	Responsible Agency / Department	Progress Made	Planned Activities	Schedule	Potential Funding Source
9.2.1 - Provide outreach on community notification system.	County, Libby, Troy, Eureka, Rexford	EMA, Sheriff's Office	New project for 2018 Plan.	Utilize print, broadcast, and social media to push out information on Code Red system.	Ongoing	County resources
9.2.2 - Promote preparation of household and facility Disaster Plans considering access and functional needs.	County, Libby, Troy, Eureka, Rexford	EMA, Sheriff's Office	Private individual has gone around to special needs facilities educating them on Code Red system.	Utilize print, broadcast, and social media to provide awareness on disaster plans. Include guidance on how to receive emergency alerts, shelter plans, evacuation routes, and communication plan.	Ongoing	County resources
9.3.1 - Enhance GIS data to better assist with mitigation.	County, Libby, Troy, Eureka, Rexford	Planning Depts., EMA, Sheriff's Office	GIS maps now of fire severity, WUI. Sheriff using for vehicle accidents, haz-mat situations. Fire Depts. continuously getting updated road books, wall maps. GIS staff getting hands on training on improving road books.	Continue same.	Ongoing	County and City of Libby resources
9.3.2 - Encourage Eureka to complete a Growth Policy that considers all hazards.	Eureka	Eureka Town Council	Eureka recently completed a Strategic Plan. Funding has been secured to complete Growth Policy.	Hire planning contractor. Attend meetings and offer input regarding hazard mitigation.	Mid-term	Town of Eureka, CDBG

Notes: BNSF = Burlington Northern-Santa Fe; CDBG = Community Development Block Grant; DEQ = Montana Department of Environmental Quality; DHS = U.S. Department of Homeland Security; DNRC = Montana Department of Natural Resources and Conservation; DPHHS = MT Department of Public Health and Human Services; EMA = Emergency Management Agency; EMS = Emergency Medical Service; FEMA = Federal Emergency Management Agency; FWP = Montana Fish, Wildlife and Parks; GIS = Geographic Information System; IT = Information Technology; LiDAR = Light Detection and Ranging; MDT = Montana Dept. of Transportation; MFRZ = Modified Fire Response Zone; NWS = National Weather Service; OU3 = Operable Unit 3; PPE = Personal Protective Equipment; USACE = United States Army Corps of Engineers; USFS = United States Forest Service; VFD = Volunteer Fire Department; WRN = Weather Ready Nation; WUI = Wildland Urban Interface



## **SECTION 6. PLAN MAINTENANCE PROCEDURES**

The plan maintenance section details the formal process that will ensure that the Lincoln County MHMP remains an active and relevant document. The maintenance process includes a schedule for monitoring and evaluating the plan and producing a plan revision every five years. The plan can be revised more frequently than five years if the conditions under which it was developed change significantly (e.g. a major disaster occurs and projects are accomplished and/or new projects need to be identified, or funding availability changes). This section also describes how Lincoln County will monitor the progress of mitigation activities and be incorporated into existing planning mechanisms. The final section describes how the Lincoln County will integrate public participation throughout the plan maintenance process.

### **6.1 Monitoring, Evaluating and Updating the Plan**

Evaluation of the mitigation plan consists of an assessment of whether the planning process and actions have been effective and whether changes are needed. The review should determine whether the hazards profiled remain relevant and what new or emerging hazards may affect the area, whether capabilities have changed to support mitigation, and whether the plan goals are being reached. Plan updates typically occur every five years but can take place more frequently, if needed.

#### **6.1.1 2011 PDM Plan**

The 2011 PDM Plan was monitored and evaluated several times since it was updated in 2011. Plan evaluation was not put on the LEPC schedule for review at regular intervals; however, the hazard profiles and mitigation projects were reviewed after hazard events or when projects came up.

#### **6.1.2 2018 MHMP**

The updated MHMP should be reviewed at meetings of the LEPC. The LEPC membership includes many of the MHMP Planning Team members who will bring insight to the group on plan development. A different hazard profile should be reviewed quarterly by the LEPC. The plan review should consider any new hazards and vulnerabilities as well as document completed mitigation projects, identify new mitigation projects and evaluate mitigation priorities. The review should determine whether a plan update is needed prior to the required five-year update.

The Lincoln County Deputy EMA director will be responsible for ensuring the MHMP review is on the agenda at the LEPC meetings so that applicability of the plan can be evaluated. The EMA director should prepare a status report summarizing the outcome of the plan review and the minutes should be made available to interested stakeholders and kept in a permanent file designated for the next (2023) MHMP update.

The MHMP will also be evaluated and revised following any major disasters, to determine if the recommended actions remain relevant and appropriate. The risk assessment will also be revisited to see if any changes are necessary based on the pattern of disaster damages. This is an opportunity to increase the community's disaster resistance and build a better and stronger community.



Three years after adoption of the MHMP, Lincoln County EMA may decide to apply for a planning grant through FEMA to start the 2023 MHMP update. Upon receipt of funding, the county will solicit bids in accordance with applicable contracting procedures and hire a contractor to assist with the project. The proposed schedule for completion of the plan update is one year from award of a contract, to coincide with the five-year adoption date of the 2018 MHMP Update.

The Lincoln County EMA director will be responsible for the plan update. Before the end of the five-year period, the updated plan will be submitted to FEMA for approval. When concurrence is received that the updated plan complies with FEMA requirements, it will be submitted to the Lincoln County Board of Commissioners, the Libby, Troy, and Eureka city/town councils for adoption. The EMA Director will send an e-mail to individuals and organizations on the stakeholder list to inform them that the updated plan is available on the county website.

## **6.2 Monitoring Progress of Mitigation Activities**

The process for monitoring and evaluating mitigation projects is the responsibility of the LEPC, an organization comprised of local officials from Lincoln County, Libby, Troy, and Eureka emergency response entities, local businesses, and non-profit organizations who meet on a regular basis.

### **6.2.1 2011 PDM Plan**

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Since development of the 2011 PDM Plan, several mitigation projects were completed in Lincoln County (see *Section 5.1*) while a number of other projects are on-going and will continue through the next planning period. The LEPC discusses hazard mitigation, as needed, and prioritizes projects based on the funding that is available and severity of hazard events that have occurred in the county.

Lincoln County EMA has monitored completion of most mitigation projects; however, the 2011 PDM Plan did not outline a specific process to track the initiation, status, and completion of mitigation activities. Each department monitors completion of mitigation projects under their purview: i.e., the Lincoln County Fire Council monitors wildfire projects; the County Road & Bridge and City Public Works departments monitor culvert and drainage projects within their jurisdiction; and, County EMA monitors severe weather projects.

### **6.2.2 2018 MHMP**

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Going forward, the LEPC will review the mitigation goals, objectives, and actions to ensure progress is being made. They will evaluate the feasibility of the mitigation projects, monitor resources, budgets, and schedules, and document project completion, at a minimum, on an annual basis. This group will provide a venue for reporting and accountability. MHMP Planning Team members are part of the LEPC.

A mitigation action plan has been developed for each project (**Appendix D-3**). Each agency or department listed as a “responsible entity” should receive a copy of the mitigation plan assigned to them and record progress and developments towards implementation. During the LEPC meetings where project status is reviewed, each agency/dept. will provide an update projects under their purview and can coordinate with the LEPC on challenges, success and opportunities. Minutes should



be prepared from these meetings and should be distributed to interested stakeholders as well as kept in a permanent file for the next MHMP update (2023).

Any grant applications filed on behalf of any of the participating jurisdictions;  
Hazard events and losses occurring in their jurisdiction;  
Progress on the implementation of mitigation actions, including efforts to obtain outside funding;  
Obstacles or impediments to implementation of actions;  
Additional mitigation actions believed to be appropriate and feasible; and  
Public and stakeholder input.

Mitigation project evaluations will assess whether:

Goals and objectives address current and expected conditions.  
The nature or magnitude of the risks has changed.  
Current resources are appropriate for implementing the MHMP and if different or additional resources are now available.  
Actions were cost effective.  
Schedules and budgets are feasible.  
Implementation problems, such as technical, political, legal or coordination issues with other agencies are presents.  
Outcomes have occurred as expected.  
New agencies/departments/staff should be included.

Individual projects will be monitored by the department implementing the project or the grant. Generally, HMGP and PDMC projects will be monitored by Lincoln County EMA and any National Fire Plan projects or Community Assessment Agreements will be monitored by the Lincoln County Fire Council, USFS and/or DNRC. Each organization will track projects through a central database and issue quarterly reports to federal agencies.

The MHMP Planning Team will continually observe the processes for implementation of the mitigation projects. By monitoring project implementation, the Planning Team will then be able to evaluate them at the time of the plan update and determine if any changes are needed.

Lincoln County may want to consider measuring their mitigation success by participating in the STAR Community Rating System. Local leaders can use the STAR Community System to assess how sustainable they are, set goals for moving ahead and measure progress along the way. To get started, go to <http://starcommunities.org/get-started>.

### **6.3 Implementation through Existing Programs**

Lincoln County will have the opportunity to implement hazard mitigation projects through existing programs and procedures through plan revisions or amendments. The MHMP will be incorporated into the plans, regulations and ordinances as they are updated in the future or when new plans are developed. **Table 6.3-1** presents a summary of existing plans and ordinances and how integration of mitigation projects will occur.



*Section 6: Plan Maintenance Procedures*

A summary of how the MHMP can be integrated into the legal framework is presented below:

Partner with other organizations and agencies with similar goals to promote building codes that are more disaster resistant on the State level.

Develop incentives for local governments, citizens, and businesses to pursue hazard mitigation projects.

Allocate county resources and assistance for mitigation projects.

Partner with other organizations and agencies in northwestern Montana to support hazard mitigation activities.

**Table 6.3-1. Implementation of Mitigation into Existing Plans and Codes**

Type	Name	Integration Technique
<b>Plans</b>		
Emergency Operations	Lincoln County Emergency Operations Plan	Integrated by reference in MHMP.
Growth Policies	Lincoln County Growth Policy,	Integration of mitigation strategies will occur when growth policies are revised.
	City of Libby Growth Policy	
	City of Troy Growth Policy	
Wildfire Mitigation	Community Wildfire Protection Plan, 2013	Wildfire mitigation projects will be incorporated when plan is revised.
Flooding	Lincoln County Flood Insurance Study	Integration of mitigation plan will occur, as appropriate, when study is revised.
<b>Codes, Regulations &amp; Ordinances</b>		
Zoning	City of Libby Zoning Regulations	Mitigation plan will be incorporated into revisions of zoning ordinances.
Subdivisions	Lincoln County Subdivision Regulations,	Mitigation plan will be incorporated into revisions of subdivision regulations.
	City of Libby Subdivision Regulations	
Floodplain	Lincoln County Floodplain Regulations	Mitigation plan will be incorporated into revisions of floodplain regulations.
	City of Libby Floodplain Regulations	
	City of Troy Floodplain Regulations	
	Town of Eureka Floodplain Regulations	

Lincoln County and the cities of Libby and Troy use Growth Policies to guide development. Typically, a Growth Policy will address hazards; specifically, that life and property be protected from natural disasters and man-caused hazards. Mitigation goals in the MHMP will be recommended for incorporation into future revisions of these growth policies to ensure that high-hazard areas are being considered for low risk uses.

To ensure that the requirements of the MHMP are incorporated into other planning mechanisms and remain an on-going concern in Lincoln County, job descriptions of various staff will be enhanced to include a mitigation component. Job descriptions of the county and City of Libby Planner/Floodplain Administrator will be augmented to include involvement in the LEPC. The Mayors of Eureka and Troy will also be encouraged to participate in the LEPC. Participation in this group will provide an awareness of new and on-going mitigation initiatives for the purpose that they be integrated into plans, codes and regulations during revision. The job description of the EMA director will include responsibilities for implementing outreach activities for risk reduction in the county, coordinating with the Board of County Commissioners to secure funding for mitigation projects, ensure mitigation projects are implemented, and updating the MHMP. The EMA director will also be responsible for maintaining permanent master file for the MHMP planning process, which will include damage





figures from hazard events, records of mitigation projects, and notes/minutes from relevant meetings.

Meetings of the Board of County Commissioners will provide an opportunity for Lincoln County EMA to report back on the progress made on the integration of mitigation planning elements into county and city/town planning documents and procedures.

## **6.4 Continued Public Involvement**

Lincoln County is dedicated to involving the public directly in review and updates of the MHMP. The public will have many opportunities to provide feedback about the plan. Hard copies of the plan will be kept at appropriate county and city/town offices. An electronic copy of the plan will be available on the Lincoln County website. The existence and location of plan hard copies will be publicized on the county website. *Section 2.0* includes the address and the phone number of Lincoln County EMA who will be responsible for keeping track of public comments on the plan.

The public will be invited to meetings of the LEPC when the MHMP is discussed. The meetings will provide the public a forum for which they can express concerns, opinions, or ideas about the plan. The EMA director will be responsible for using county resources to publicize the public meetings and maintain public involvement through the newspapers, radio and Internet.

The MHMP Planning Team will continually observe the processes for public outreach. By monitoring these activities, the Planning Team will then be able to evaluate them at the time of the plan update and determine if any changes are needed.



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