



Yellowstone County, Montana,

Community Wildfire Protection Plan

February 28, 2006

Vision: Institutionalize and promote a countywide hazard mitigation ethic through leadership, professionalism, and excellence, leading the way to a safe, sustainable Yellowstone County.



This plan was developed by the Yellowstone County Community Wildfire Protection Plan Committee in cooperation with Northwest Management, Inc., P.O. Box 565, Helena, MT 59624, Phone: (406) 442-7555, Fax: (406) 495-9605, www.Consulting-Foresters.com

Acknowledgments

This Community Wildfire Protection Plan represents the efforts and cooperation of a number of organizations and agencies; through the commitment of people working together to improve the preparedness for wildfire events while reducing factors of risk.



Yellowstone County Commissioners
and the employees of Yellowstone County



State of
Montana



USDI Bureau of Land Management



USDI Bureau of Indian Affairs



USDA Forest
Service



FEMA

Federal Emergency Management
Agency



Montana Disaster and Emergency
Services



USDI Bureau of Reclamation



Beartooth Resource
Conservation & Development
Council



Montana Fish, Wildlife, &
Parks



Montana Department of Natural
Resources and Conservation



City of Billings
City of Laurel
Town of Broadview
Yellowstone County Sheriff's Office
Yellowstone County Fire Departments
Yellowstone County Fire Districts
Yellowstone County Fire Service Areas
Deaconess Hospital
&
Local Businesses and Citizens of Yellowstone
County

To obtain original copies of this plan contact:

Yellowstone County Commissioner's Office
Yellowstone County Courthouse
217 North 27th Street
Billings, Montana 59101

Table of Contents

CHAPTER I: OVERVIEW OF THIS PLAN AND ITS DEVELOPMENT	8
1 INTRODUCTION	8
1.1 GOALS AND GUIDING PRINCIPLES.....	9
1.1.1 Federal Emergency Management Agency Philosophy	9
1.1.2 Additional State and Federal Guidelines Adopted.....	10
1.1.2.1 National Fire Plan	10
1.1.2.1.1 Montana's Endorsement of the National Fire Plan.....	11
1.1.2.2 Northern Rockies Coordinating Group	12
1.1.2.2.1 County Wildland Fire Interagency Group.....	12
1.1.2.3 National Association of State Foresters	13
1.1.2.3.1 Identifying and Prioritizing Communities at Risk.....	13
1.1.2.3.2 Conceptual Approach.....	14
1.1.2.4 Healthy Forests Restoration Act	16
1.1.3 Local Guidelines and Integration with Other Efforts.....	16
1.1.3.1 Yellowstone County Fire Mitigation Planning Effort and Philosophy.....	16
1.1.3.1.1 Mission Statement.....	16
1.1.3.1.2 Vision Statement.....	16
1.1.3.1.3 Goals	17
1.1.3.2 Yellowstone County and City of Billings 2003 Growth Policy Plan	17
CHAPTER 2: PLANNING PROCESS.....	18
2 DOCUMENTING THE PLANNING PROCESS	18
2.1 DESCRIPTION OF THE PLANNING PROCESS	18
2.2 THE PLANNING TEAM	18
2.2.1 Multi-Jurisdictional Participation	19
2.3 PUBLIC INVOLVEMENT.....	20
2.3.1 News Releases	20
2.3.2 Newspaper Articles.....	21
2.3.3 Public Mail Survey	27
2.3.3.1 Survey Results	28
2.3.4 Committee Meetings.....	30
2.3.4.1 Committee Meeting Notes	32
2.3.4.1.1 August 18 th , 2005 – Yellowstone County Courthouse	32
2.3.4.1.2 September 15 th , 2005 – Deaconess Billings Clinic.....	33
2.3.4.1.3 October 19 th , 2005 – Billings Deaconess Hospital, Fortin Conference Center.....	36
2.3.4.1.4 November 17 th , 2005 – Emergency Operations Center in Billings.....	37
2.3.5 Public Meetings	37
2.3.5.1 October 3 rd , 2005 – Laurel Fire Hall.....	37
2.3.5.2 October 4 th , 2005 – Yellowstone County Courthouse, Commissioners Meeting	39
2.3.5.3 October 4 th , 2005 – Worden VFW Hall	39
2.3.5.4 October 5 th , 2005 – Yellowstone County Courthouse.....	40
2.3.5.5 October 5 th , 2005 – Broadview Community Center	40
2.3.5.6 October 6 th , 2005 – Lockwood School.....	41
2.3.6 Documented Review Process.....	47
2.3.7 Continued Public Involvement	47
CHAPTER 3: COUNTY CHARACTERISTICS & RISK ASSESSMENT	49
3 BACKGROUND AND AREA DESCRIPTION.....	49
3.1 LOCATION AND LAND FORMS	49
3.2 DEMOGRAPHICS	53
3.3 SOCIOECONOMICS.....	55
3.4 DESCRIPTION OF YELLOWSTONE COUNTY	58
3.4.1 Recreation.....	58
3.4.1.1 BLM Public Lands.....	59

3.4.1.2	Camping.....	59
3.4.1.3	Fishing and Hunting.....	59
3.4.2	Resource Dependency.....	59
3.4.3	Development Trends.....	60
3.4.4	Land Use.....	61
3.4.4.1	Agricultural Land Use.....	61
3.5	EMERGENCY SERVICES.....	62
3.6	CULTURAL RESOURCES.....	62
3.6.1	Crow Indian Reservation.....	63
3.6.2	National Register of Historic Places.....	64
3.7	TRANSPORTATION.....	66
3.8	VEGETATION & CLIMATE.....	66
3.8.1	Monthly Climate Summaries in Yellowstone County.....	68
3.8.1.1	Billings.....	68
3.8.1.2	Laurel.....	68
3.8.1.3	Huntley.....	69
3.8.1.4	Custer.....	69
3.8.1.5	Broadview, Montana.....	69
3.9	WILDFIRE HAZARD PROFILES.....	70
3.9.1	Wildfire Ignition Profile.....	70
3.9.1.1	Shepherd Volunteer Fire Department Fire History.....	73
3.9.1.2	Billings Urban Fire Service Area Statistics.....	74
3.9.2	National Fire Statistics.....	75
3.9.2.1	Prescribed Burning of Federal Acres.....	77
3.9.2.2	Firefighter Accidents.....	77
3.9.2.2.1	Deaths on the Ground from Fire.....	78
3.9.2.2.2	Municipal Fire Fighters.....	79
3.9.2.2.3	Deaths While Responding to or Return from Alarms.....	79
3.9.2.2.4	Montana State Fatalities.....	80
3.10	ANALYSIS TOOLS AND TECHNIQUES TO ASSESS FIRE RISK.....	81
3.10.1	Fire Prone Landscapes.....	81
3.10.2	Historic Fire Regime.....	84
3.10.2.1	General Limitations.....	84
3.10.3	Fire Regime Condition Class.....	85
3.10.4	Predicted Fire Severity.....	87
3.10.4.1	Purpose.....	87
3.10.4.2	General Limitations.....	88
3.10.5	On-Site Evaluations.....	88
3.10.6	Fuel Model Descriptions.....	88
3.10.6.1	Grass Group.....	89
3.10.6.1.1	Fire Behavior Fuel Model 1.....	89
3.10.6.1.2	Fire Behavior Fuel Model 2.....	89
3.10.6.1.3	Fire Behavior Fuel Model 3.....	89
3.10.6.2	Shrub Group.....	90
3.10.6.2.1	Fire Behavior Fuel Model 4.....	90
3.10.6.2.2	Fire Behavior Fuel Model 5.....	90
3.10.6.2.3	Fire Behavior Fuel Model 6.....	90
3.10.6.2.4	Fire Behavior Fuel Model 7.....	91
3.10.6.3	Timber Group.....	91
3.10.6.3.1	Fire Behavior Fuel Model 8.....	91
3.10.6.3.2	Fire Behavior Fuel Model 9.....	92
3.10.6.3.3	Fire Behavior Fuel Model 10.....	92
3.10.6.4	Logging Slash Group.....	93
3.10.6.4.1	Fire Behavior Fuel Model 11.....	93
3.10.6.4.2	Fire Behavior Fuel Model 12.....	93
3.10.6.4.3	Fire Behavior Fuel Model 13.....	93
3.11	WILDLAND-URBAN INTERFACE.....	94
3.11.1	People and Structures.....	94
3.11.2	Infrastructure.....	96

3.11.3	Ecosystems	97
3.12	SOILS	97
3.12.1	Fire Mitigation Practices to Maintain Soil Processes	98
3.13	HYDROLOGY	98
3.13.1	Fire Mitigation Practices to Maintain Hydrologic Processes	99
3.14	AIR QUALITY	100
3.14.1	Fire Mitigation Practices to Maintain Air Quality	101
CHAPTER 4: SUMMARIES OF RISK AND PREPAREDNESS		104
4	OVERVIEW	104
4.1	WILDLAND FIRE CHARACTERISTICS	104
4.1.1	Weather	104
4.1.2	Topography	104
4.1.3	Fuels	105
4.1.3.1	Conservation Reserve Program Lands	105
4.2	YELLOWSTONE COUNTY CONDITIONS	106
4.2.1	County Wide Potential Mitigation Activities	107
4.2.1.1	Prevention	107
4.2.1.2	Education	108
4.2.1.3	Readiness	108
4.2.1.4	Building Codes	109
4.3	YELLOWSTONE COUNTY'S WILDLAND-URBAN INTERFACE	109
4.3.1	Mitigation Activities Applicable to all Communities	109
4.3.1.1	Homesite Evaluations and Creation of Defensible Space	109
4.3.1.2	Travel Corridor Fire Breaks	110
4.3.1.3	Power Line Corridor Fire Breaks	110
4.4	COMMUNITIES IN YELLOWSTONE COUNTY	110
4.4.1	Vegetative Associations and Overall Fuels Assessment	110
4.4.2	Individual Community Assessments	111
4.4.2.1	Billings	111
4.4.2.1.1	Fire Potential	112
4.4.2.1.2	Ingress-Egress	113
4.4.2.1.3	Infrastructure	113
4.4.2.1.4	Fire Protection	114
4.4.2.1.5	Community Assessment	114
4.4.2.1.6	Mitigation Activities	114
4.4.2.2	Laurel	115
4.4.2.2.1	Fire Potential	116
4.4.2.2.2	Ingress-Egress	117
4.4.2.2.3	Infrastructure	117
4.4.2.2.4	Fire Protection	118
4.4.2.2.5	Community Assessment	118
4.4.2.2.6	Mitigation Activities	119
4.4.2.3	Broadview and Acton	120
4.4.2.3.1	Fire Potential	120
4.4.2.3.2	Ingress-Egress	121
4.4.2.3.3	Infrastructure	121
4.4.2.3.4	Fire Protection	121
4.4.2.3.5	Community Assessment	121
4.4.2.3.6	Mitigation Activities	121
4.4.2.4	Custer	122
4.4.2.4.1	Fire Potential	122
4.4.2.4.2	Ingress-Egress	123
4.4.2.4.3	Infrastructure	123
4.4.2.4.4	Fire Protection	123
4.4.2.4.5	Community Assessment	123
4.4.2.4.6	Mitigation Activities	123
4.4.2.5	Huntley	124
4.4.2.5.1	Fire Potential	124

4.4.2.5.2	Ingress-Egress	125
4.4.2.5.3	Infrastructure	125
4.4.2.5.4	Fire Protection.....	125
4.4.2.5.5	Community Assessment.....	125
4.4.2.5.6	Mitigation Activities	126
4.4.2.6	Lockwood	126
4.4.2.6.1	Fire Potential	126
4.4.2.6.2	Ingress-Egress	127
4.4.2.6.3	Infrastructure	127
4.4.2.6.4	Fire Protection.....	128
4.4.2.6.5	Community Assessment.....	128
4.4.2.6.6	Mitigation Activities	128
4.4.2.7	Shepherd	129
4.4.2.7.1	Fire Potential	129
4.4.2.7.2	Ingress-Egress	130
4.4.2.7.3	Infrastructure	130
4.4.2.7.4	Fire Protection.....	131
4.4.2.7.5	Community Assessment.....	131
4.4.2.7.6	Mitigation Activities	132
4.4.2.8	Worden, Ballantine, and Pompeys Pillar	132
4.4.2.8.1	Fire Potential	132
4.4.2.8.2	Ingress-Egress	133
4.4.2.8.3	Infrastructure	133
4.4.2.8.4	Fire Protection.....	133
4.4.2.8.5	Community Assessment.....	133
4.4.2.8.6	Mitigation Activities	134
4.4.2.9	Molt	134
4.4.2.9.1	Fire Potential	134
4.4.2.9.2	Ingress-Egress	135
4.4.2.9.3	Infrastructure	135
4.4.2.9.4	Fire Protection.....	135
4.4.2.9.5	Community Assessment.....	135
4.4.2.9.6	Mitigation Activities	135
4.4.2.10	Blue Creek	136
4.4.2.10.1	Fire Potential	136
4.4.2.10.2	Ingress-Egress	137
4.4.2.10.3	Infrastructure	137
4.4.2.10.4	Fire Protection.....	137
4.4.2.10.5	Community Assessment.....	138
4.4.2.10.6	Mitigation Activities.....	138
4.5	FIREFIGHTING RESOURCES AND CAPABILITIES	139
4.5.1	Rural and City Fire Protection	139
4.5.1.1	Billings Fire Department.....	139
4.5.1.2	Broadview Rural Fire District #3	142
4.5.1.3	Lockwood Fire Department	143
4.5.1.4	Worden Volunteer Fire Department.....	146
4.5.1.5	Worden Fire District #4	148
4.5.1.6	Custer Volunteer Fire Department.....	148
4.5.1.7	Molt Volunteer Fire Department.....	149
4.5.1.8	Shepherd Volunteer Fire Department.....	150
4.5.1.9	Blue Creek Volunteer Fire Department.....	152
4.5.1.10	Laurel Volunteer Fire Department	155
4.5.2	Wildland Fire Protection.....	155
4.5.2.1	Bureau of Land Management.....	155
4.5.2.2	Bureau of Indian Affairs, Crow Agency Wildland Fire and Aviation Management Program.....	157
4.6	CURRENT WILDFIRE MITIGATION ACTIVITIES IN YELLOWSTONE COUNTY	158
4.6.1	Yellowstone County Coop Program	158
4.6.2	Lockwood Fire District Education and Awareness Campaign	159
4.7	ISSUES FACING YELLOWSTONE COUNTY FIRE PROTECTION	159
4.7.1	Augmentation of Emergency Water Supplies.....	159
4.7.2	Recruitment and Retention, Funding, Equipment Needs, Etc.....	160

4.7.3	Persistent Rapid Growth	160
4.7.4	Accessibility	160
4.8	PROPOSED HOME DEFENSIBLE SPACE AND EDUCATION PROJECTS.....	160
CHAPTER 5: TREATMENT RECOMMENDATIONS		162
5	ADMINISTRATION & IMPLEMENTATION STRATEGY	162
5.1	PRIORITIZATION OF MITIGATION ACTIVITIES.....	162
5.1.1	Prioritization Scheme.....	163
5.1.1.1	Benefit / Cost	164
5.1.1.2	Population Benefit	164
5.1.1.3	Property Benefit	165
5.1.1.4	Economic Benefit.....	165
5.1.1.5	Vulnerability of the Community	165
5.1.1.6	Project Feasibility (Environmentally, Politically & Socially)	165
5.1.1.7	Hazard Magnitude/Frequency	165
5.1.1.8	Potential for repetitive loss reduction.....	166
5.1.1.9	Potential to mitigate hazards to future development	166
5.1.1.10	Potential project effectiveness and sustainability	166
5.1.1.11	Final ranking	166
5.2	POSSIBLE FIRE MITIGATION ACTIVITIES	166
5.2.1	Existing Practices That Should Continue.....	167
5.3	WUI SAFETY & POLICY	167
5.3.1	Overall Goals	167
5.3.2	Proposed Activities	168
5.4	PEOPLE AND STRUCTURES	170
5.4.1	Overall Goals	171
5.4.2	Proposed Activities	172
5.5	INFRASTRUCTURE	178
5.5.1	Overall Goals.....	179
5.5.2	Proposed Activities	180
5.6	RESOURCE AND CAPABILITY ENHANCEMENTS	185
5.6.1	Overall Goals.....	185
5.6.2	Proposed Activities	186
5.7	REGIONAL LAND MANAGEMENT RECOMMENDATIONS.....	190
5.7.1	Federal and State Agency Projects	191
5.7.1.1	Bureau of Land Management On-going Projects	191
5.7.1.1.1	Sundance Lodge Special Recreation Management Area	191
5.7.1.1.2	Four Dances Natural Area.....	191
5.7.1.1.3	South Hills Area	191
5.7.1.1.4	Acton Area	192
5.7.1.1.5	Pompey's Pillar National Monument	192
5.7.1.1.6	Shepherd Ah-Nei Recreation Area	192
5.7.1.1.7	Other Projects.....	193
5.7.2	Conservation Reserve Program.....	193
CHAPTER 6: SUPPORTING INFORMATION.....		194
6		194
6.1	LIST OF TABLES	194
6.2	TABLE OF FIGURES	196
6.3	LIST OF PREPARERS	197
6.4	SIGNATURE PAGES	198
6.4.1	Yellowstone County Resolution	199
6.4.2	City of Billings Resolution	200
6.4.3	City of Laurel Resolution	201
6.4.4	Town of Broadview Resolution.....	202
6.4.5	Representatives of Fire Departments	203
6.4.6	Representatives of Community Organizations, Federal, and State Agencies	205

6.4.7 Yellowstone County Community Wildfire Protection Plan Coordinators205

6.5 GLOSSARY OF TERMS206

6.6 LIST OF ACRONYMS212

6.7 LITERATURE CITED213