**Table of Content**

CHAPTER I - Introduction

Acknowledgements…………………………………………………… 1

Signature Page …..…..................................................................... 3

Introduction

Plan Overview and Development ………………………………….. 4

Plan Compliance …………………………………………………….. 5

Plan Endorsement and Development ……………………………... 7

Summary ……………………………………………………………… 8

CHAPTER II – Mission, Goals, and Objectives

Mission Statement…………………………………………………… 1

National Strategy ……………………………………………………. 1

Goals and Objectives………………………………………………… 3

Wildfire Response

Existing Efforts…............................................................................ 4

Opportunities for Improvement………………………………………. 5

Objectives……………………………………………………………… 6

Fire Adapted Communities

Existing Efforts………………………………………………………… 7

Opportunities for Improvement……………………………………….. 8

Objectives………………………………………………………………. 9

Restore and Maintain Landscapes - Resiliency

Existing Efforts………………………………………………………… 10

Opportunities for Improvement……………………………………….. 12

Objectives………………………………………………………………. 13

Communication and Collaboration

Existing Collaboration………………………………………………… 14

Opportunities for Improvement………………………………………. 15

Funding and Economic Assistance

Overview……………………………………………………………….. 18

Opportunities for Improvement……………………………………….. 20

Summary……………………………………………………………………….. 22

Chapter III – Wildland Urban Interface Planning

Wildland-Urban Interface Zone……………………………………………… 1

Plan Review Schedule and Mechanisms…………………………………... 4

National Priorities……………………………………………………………... 6

Union County Plan Priorities…………………………………………………. 7

Participation and Responsibilities

County Commissioners……………………………………………….. 8

Union County Emergency Service…………………………………… 8

CWPP Committee Members………………………………………….. 9

Rural Fire Departments……………………………………………….. 10

Cooperators…………………………………………………………….. 10

Union County and Adjacent Fire Management Agencies…………. 11

Community……………………………………………………………… 12

Summary………………………………………………………………………… 13

Chapter IV – Union County Profile

Introduction……………………………………………………………………… 1

Land Ownership and Stewardship………………………………………….... 3

Population and Demographics………………………………………………... 4

Employment and Industry……………………………………………………… 5

Local Climate……………………………………………………………………. 7

Fire History Overview…………………………………………………………... 13

Major Union County Fires……………………………………………… 15

Communities and Wildfire……………………………………………… 17

Economic Impacts of Major Fires……………………………………… 19

Suppression Costs……………………………………………………… 19

Additional Local Economy

Recreation Economy……………………………………………………………. 21

Ranching…………………………………………………………………………. 21

Timber…………………………………………………………………………….. 22

Case Studies…………………………………………………………………….. 23

Summary…………………………………………………………………………. 23

Chapter V – Community Participation and Education

Introduction………………………………………………………………………. 1

Outreach………………………………………………………………………….. 2

Rural Fire Departments…………………………………………………………. 3

Outreach………………………………………………………………….. 3

Union County Defense Board Meeting………………………………... 3

Cooperators………………………………………………………………………. 4

Outreach………………………………………………………………….. 4

Cooperators Workshop…………………………………………………. 5

Local Residents and Communities……………………………………………. 5

Outreach…………………………………………………………………. 5

Public Meetings…………………………………………………………. 6

Programs

FireWise…………………………………………………………………... 7

Ready-Set-Go……………………………………………………………. 8

Public Surveys…………………………………………………………… 8

Outreach…………………………………………………………………. 9

Summary and Recommendations…………………………………………….. 10

Chapter VI – Wildfire Risk Assessment

Introduction………………………………………………………………………. 1

Union County Fire Statistics

Union County Fire Frequency………………………………………….. 1

Large Fire History………………………………………………………... 2

Mean Fire Costs…………………………………………………………. 3

Fire Records……………………………………………………………… 4

Fire Regime Condition Class………………………………………………….. 6

West Wide Risk Assessment

Union County Fire Threat………………………………………………. 7

Fire Occurrence…………………………………………………………. 8

Weather…………………………………………………………………… 8

Slope……………………………………………………………………… 9

Fuel Models………………………………………………………………. 9

Canopy Fuels……………………………………………………………. 11

Fire Behavior Results – Surface and Canopy Fire

Fire Behavior…………………………………………………………….. 12

Fire Flame Lengths and Rates of Spread…………………………….. 13

Potential for Crown Fires……………………………………………….. 14

Fire Threat Index………………………………………………………………… 15

Fire Effects……………………………………………………………………….. 17

Suppression Difficulty…………………………………………………… 18

Values Impacted…………………………………………………………. 19

Values Impacted Rating………………………………………………… 23

Overall Fire Effects Index………………………………………………. 24

Overall Fire Risk Index………………………………………………………….. 26

Final Four Ratings Breakdown – Low, Moderate, High, Extreme………….. 30

Summary…………………………………………………………………………. 34

Chapter VII – Communities at Risk and WUI Zone Priority Setting

Introduction………………………………………………………………………. 1

Prioritizing Communities at Risk……………………………………………….. 4

Prioritization Attribute Overview………………………………………... 5

Overall Fire Protection Capabilities/Structural Vulnerability………... 5

Communities at Risk Ranking Results………………………………… 6

Interpretation of Results………………………………………………… 9

Management Consideration……………………………………………. 9

WUI Zone and Middle Ground

WUI Zone and Middle Ground Assessment…………………………. 11

Landscape Conditions………………………………………………….. 12

Attributes for Landscape Conditions………………………………….. 12

WUI Zone Assessment Results

Fire Regime Condition Class………………………………………….. 14

Management Considerations………………………………………….. 14

Fire Threat Attributes

Probability of Fire Occurrence…………………………………………. 15

Management Considerations………………………………………….. 15

Canopy Base Height……………………………………………………. 16

Management Considerations………………………………………….. 16

Surface Fuels…………………………………………………………….. 17

Management Considerations………………………………………….. 18

Probability of a Canopy Fire…………………………………………….. 19

Management Considerations…………………………………………… 19

Expected Fire Flame Lengths and Rates of Spread………………….. 21

Worst Case (Most Extreme) Flame Lengths and Rates of Spread…. 21

Management Considerations…………………………………………… 22

Suppression Difficulty……………………………………………………. 24

Management Considerations…………………………………………… 24

Values Impacted………………………………………………………….. 25

WUIZ and Union County Structure Densities…………………………. 26

Management Considerations…………………………………………… 27

Three Primary Outputs

Fire Threat Index………………………………………………………… 29

Management Considerations………………………………………….. 30

Fire Effects Index………………………………………………………… 31

Management Considerations…………………………………………... 32

Fire Risk Index…………………………………………………………… 34

Management Considerations………………………………………….. 35

WUIZ Percentage of Land Coverage – Current Condition Level….. 38

Summary…………………………………………………………………………. 39

Chapter VIII – Mitigation Action Items and Opportunities

Introduction………………………………………………………………………. 1

Mitigation Measures Guidance………………………………………………… 2

Progress Monitoring…………………………………………………………….. 4

Action Items………………………………………………………………………. 5

Wildfire Response……………………………………………………………….. 7

Mitigation Actions Items…………………………………………………. 8 – 22

Fire Adapted Communities……………………………………………………… 23

Mitigation Action Items…………………………………………………… 25 – 35

Restore and Maintain Landscapes…………………………………………….. 36

Mitigation Actions Items………………………………………………….. 38 – 44

Summary…………………………………………………………………………... 45

Chapter IX – Fuels Treatment, Maintenance, and Biomass

Introduction……………………………………………………………………….. 1

Forest Health……………………………………………………………………… 2

Importance of Fuels………………………………………………………. 3

Surface Fuels……………………………………………………………… 5

Aerial Fuels………………………………………………………………… 6

Ladder Fuels………………………………………………………………. 8

Fuels Treatment…………………………………………………………………… 10

Thinning……………………………………………………………………. 12

Pruning…………………………………………………………………….. 13

Surface Fuel Reduction………………………………………………….. 13

Prescribed Fire…………………………………………………………….. 14

Biomass Utilization……………………………………………………….. 15

Hand and Machine Piling………………………………………………… 16

Summary…………………………………………………………………………… 17

Chapter X – Accomplishments and Challenges

Introduction……………………………………………………………………….. 1

Accomplishments

Oregon Department of Forestry and Private Lands………………….. 1

Wallowa-Whitman National Forest…………………………………….. 2

Umatilla National Forest…………………………………………………. 4

Challenges

Project Planning, Pace and Scale…………………………………………. 6

Maintenance…………………………………………………………………. 7

Inventoried Roadless Area …………………………………………………. 10

Infrastructure…………………………………………………………………. 13

Air Quality…………………………………………………………………….. 13

Beyond the WUI Zone………………………………………………………. 15

Summary……………………………………………………………………………… 16

Chapter XI – Emergency Management

Introduction………………………………………………………………………….. 1

Infrastructure………………………………………………………………………… 1

Land Protection……………………………………………………………………… 3

Unprotected Lands………………………………………………………….. 4

East La Grande Valley – Cove…………………………………….. 4

North of La Grande………………………………………………….. 5

Southeastern County Area Union…………………………………. 5

Land Protection Without Structure Protection……………………………. 5

Oregon Department of Forestry Protection……………………. 6

Forest Service Protection………………………………………... 7

Dual Protection Areas……………………………………………………. 8

Protection Capabilities…………………………………………………………… 8

Protection Compliance…………………………………………………………… 10

Mitigation Action Plan for Emergency Services……………………………….. 11

Information Dissemination………………………………………………………. 11

County Wide Fire Simulation Scenarios……………………………………….. 12

Zoning and Standards……………………………………………………………. 12

Fire Siting/Zoning Standards Information……………………………… 12

Defensible Space………………………………………………………………… 13

Interoperability between Dispatch Centers……………………………………. 14

Training……………………………………………………………………………. 14

Summary…………………………………………………………………………... 15

APPENDIX

Appendix A – Mutual Aid Agreement Standardized Use Agreements

Appendix B – Fire History and Fire Regime Condition Class

Appendix C – Natural Hazard Plan

Appendix D – Wildfire Risk Assessment Concepts

Appendix E – Numerical Scoring Criteria

Appendix F – Prioritization Data, Attributes, Rational

Appendix G – Agency Fire Resource Summary

Appendix H – List of Participants

Appendix I – Funding Mechanisms

Appendix J – Glossary of Terms

Appendix K – Fuel Treatment Case Studies

Appendix L – CWPP Forms and Miscellaneous Documents

**List of Figures and Tables by Chapter**

Chapter II – Mission, Goals, and Objectives

Figure II - 1. Structures Lost by Decade ……………………………………… 19

Chapter III – Wildland Urban Interface Planning

Figure III – 1. Union County WUI Zone Map………………………………….. 2

Chapter IV – Union County Profile

Figure IV – 1. Union County Vicinity Map for State of Oregon……………… 1

Figure IV – 2. Distribution of highest populated communities……………… 2

Figure IV – 3. WUI Zone with Rural Fire Districts……………………………. 3

Figure IV – 4. Union County Landownership Distribution………………….. 3

Figure IV – 5. Profile of Union County Agriculture………………………….. 6

Figure IV – 6. Daily Temperature Averages and Extremes – La Grande….. 7

Figure IV – 7. Graphic Distribution of Union County Precipitation………….. 8

Figure IV – 8. Average Total Monthly Precipitation of La Grande (40 yrs)…. 8

Figure IV – 9. Changes in Mean Temperatures for Union County…............. 11

Figure IV – 10. Precipitation and Temperature Departures in West……….. 12

Figure IV – 11. Fire Starts 1999 – 2008 for Union County………………….. 13

Figure IV – 12. Fire Occurrence Levels of Union County …………………… 14

Figure IV – 13. Distribution of Fire Starts – Monthly…………………………. 15

Figure IV – 14. Rooster Peak Fire …………………………………………….. 15

Figure IV – 15. Mount Harris Fire ……………………………………………… 16

Figure IV – 16. Phillips Creek Fire……………………………………………… 17

Figure IV – 17. Phillips Creek Fire……………………………………………… 17

Figure IV – 18. Fire Suppression Cost Breakdown…………………………. 21

Tables IV - Tables

Table IV – 1. Comparison of County and State Land Distribution…………. 4

Table IV – 2. Population Estimate for Incorporated cities and county……… 4

Table IV – 3. Forecasted population growth of Union County………………. 5

Chapter V – Community Participation and Education

None

Chapter VI – Wildfire Risk Assessment

Figure VI – 1. Union County Historical Large Fires……………….…………. 2

Figure VI – 2. Large Fire (50 acres plus) per Decade……………………….. 3

Figure VI – 3. Mean Large Fire Costs per Decade………………………….. 3

Figure VI – 4. Historical Fire Points in Union County………………………… 4

Figure VI – 5. Fire Records of City and Rural Fire Departments…………… 5

Figure VI – 6. Western States Historical Fire Regimes Groups……………. 6

Figure VI – 7. Distribution of Probability of Ignition in Union County………. 8

Figure VI – 8. Union County Slope Map………………………………………. 9

Figure VI – 9. Union County Fuel Model Distribution Map………………….. 10

Figure VI – 10. Union County Canopy Height Distribution………………….. 11

Figure VI – 11. Fire Behavior Triangle elements of influence………………. 12

Figure VI – 12. Expected Flame Lengths in Union County………………….. 13

Figure VI – 13. Expected Fire Rates of Spread in Union County…………… 13

Figure VI – 14. Expected Type of Fire in Union County……………………… 14

Figure VI – 15. Probability of Canopy Fire…………………………………….. 15

Figure VI – 16. Union County Acres per Fire Threat Level…………………. 16

Figure VI – 17. Fire Threat Index of Union County…………………………… 17

Figure VI – 18. Suppression Difficulty Levels in Union County……………... 19

Figure VI – 19. Infrastructure and anticipated negative impacts……………. 20

Figure VI – 20. Wildland Developed Areas……………………………………. 21

Figure VI – 21. Housing Density of Residential Areas (WWRA)……………. 21

Figure VI – 22. Comparison of WWRA data and Local structure data……... 22

Figure VI – 23. Zoomed in Structure Comparison of Elgin Community……. 22

Figure VI – 24. Structure Density using local data……………………………. 22

Figure VI – 25. Values Impacted, Least to Most Negative Impact………….. 23

Figure VI – 26. Union County Acres per Fire Effects Level…………………. 24

Figure VI – 27. Fire Effects Geographic Distribution in Union County……. 25

Figure VI – 28. Zoomed in Mount Emily of Fire Occurrence………………… 27

Figure VI – 29. Zoomed in Mount Emily of Fire Threat Index ………………. 27

Figure VI – 30. Zoomed in Mount Emily of Fire Effects Index………………. 27

Figure VI – 31. Mount Emily Overall Fire Risk Index……………………….... 27

Figure VI – 32. Distribution of Fire Risk Levels in Acres for Union County.. 28

Figure VI – 33. Geographic Distribution of Fire Risk for Union County……. 29

Figure VI – 34. Low to Extreme Acres and Mapping of Fire Threat…….….. 31

Figure VI – 35. Low to Extreme Acres and Mapping of Fire Effects……….. 32

Figure VI – 36. Low to Extreme Acres and Mapping of Fire Risk………….. 33

Chapter VII – Communities at Risk and WUI Zone Ratings

Figure VII – 1. Communities at Risk Rating Chart……………………………. 7 – 8

Figure VII – 2. WUI Zone Fire Regime Condition Class…………………….. 14

Figure VII – 3. WUI Zone Probability of Fire Occurrence…………………… 15

Figure VII – 4. WUI Zone Canopy Base Height……………………………… 16

Figure VII – 5. WUI Zone Fuel Model Distribution…………………………… 17

Figure VII – 6. WUI Zone Probability of Canopy Fire………………………… 19

Figure VII – 7. Fuel Treatment and Fire Behavior……………………………. 20

Figure VII – 8. WUI Zone Expected Flame Length…………………………… 21

Figure VII – 9. WUI Zone Expected Fire Rate of Spread……………………. 21

Figure VII – 10. WUI Zone Extreme Flame Lengths…………………………. 22

Figure VII – 11. WUI Zone Extreme Fire Rates of Spread…………………... 22

Figure VII – 12. Fire Haul Chart…Flames and Resource Capability……….. 23

Figure VII – 13. WUI Zone display of Suppression Difficulty………………... 24

Figure VII – 14. Values Impacted in Union County…………………………… 25

Figure VII – 15. County Structure Points and WWRA Housing…………….. 26

Figure VII – 16. Zoomed in Structure Points in Elgin Area………………….. 26

Figure VII – 17. Structure Density Map……………………………………….. 27

Figure VII – 18. Zoomed in Structure Density Map………………………….. 27

Figure VII – 19. WUI Zone Overall Fire Threat Map………………………… 29

Figure VII – 20. Overall Fire Effects Map…………………………………….. 31

Figure VII – 21. Zoomed in Fire Effects of Mount Emily Area……………… 32

Figure VII – 22. WUI Zone Extreme Fire Risk only Map…………………….. 34

Figure VII – 23. WUI Zone High Fire Risk only Map…………………………. 34

Figure VII – 24. WUI Zone Moderate Fire Risk only Map……………………. 35

Figure VII – 25. WUI Zone Low Fire Risk only Map…………………………. 35

Figure VII – 26. Zoomed in Fire Occurrence La Grande Area……………… 36

Figure VII – 27. Zoomed in Fire Threat La Grande Area……………………. 36

Figure VII – 28. Zoomed in Fire Effects La Grande Area…………………… 37

Figure VII – 29. Zoomed in Fire Risk La Grande Area………………………. 37

Figure VII – 30. Chart of % WUI Zone Land Coverage of Attributes………. 38

Chapter VIII – Mitigation Action Items and Opportunities

None

Chapter IX – Fuels Treatment, Maintenance, and Biomass

Figure IX – 1. Fire Triangle and Fire Behavior Triangle Components……… 4

Figure IX – 2. WUI Zone Fuel Model Composition …………………………… 5

Figure IX – 3. Stand Condition Comparison…………………………………… 7

Figure IX – 4. Ladder Fuel Photo Examples…………………………………… 8

Figure IX – 5. WUI Zone Current Canopy Base Height……………………… 9

Figure IX – 6. WUI Zone Probability of Canopy Fire…………………………. 10

Figure IX – 7. Canopy Base Height Changes Post Prescribed Fire……….. 14

Chapter X – Accomplishments and Challenges

Figure X – 1. Oregon Department Forestry Treatment Accomplishments…. 2

Figure X – 2. Mount Emily Before and After Treatment Photos…………….. 3

Figure X – 3. Pre and Post Crown Density Reduction Photos………………. 3

Figure X – 4. Wallowa-Whitman Vegetation Treatment Accomplishment…. 4

Figure X – 5. Wallowa-Whitman Fuels Treatment Accomplishment……….. 4

Figure X – 6. Umatilla N.F. Fuels and Vegetation Accomplishment……….. 5

Figure X – 7. All Fuels and Vegetation Treatment County Wide……………. 9

Figure X – 8. Zoomed Fire Risk and Roadless near Cove…………………… 11

Figure X – 9. Zoomed Fire Risk and Roadless Northwest of La Grande…… 11

Figure X – 10. County Wide Roadless Overlay with WUI Zone…………….. 12

Figure X – 11. Smoke Emissions Comparison Prescribed Fire vs. Wildfire.. 14

Chapter XI – Emergency Management

Figure XI – 1. Union County Infrastructure……………………………………. 2

Figure XI – 2. Negative Impacts of Wildfire on Infrastructure……………….. 2

Figure XI – 3. Union County Protection Authority……………………………. 4

Figure XI – 4. Structure Protection Estimated Response Times in County.. 6

Figure XI – 5. Unprotected Structures within WUI Zone against Fire Risk… 7

Figure XI – 6. Dual Protection Coverage Acres………………………………. 8

Figure XI – 7. County Wide Fire Department Detail Coverage Information.. 9