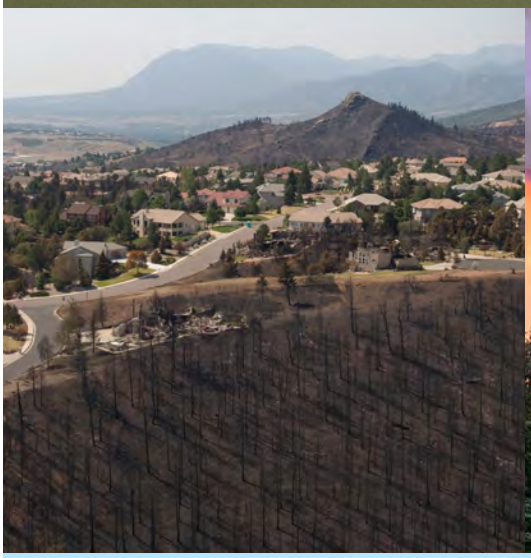
Land Use Planning & Wildfire Workshop



COMMUNITY PLANNING ASSISTANCE FOR WILDFIRE

Creating fire-adapted communities through better land use planning in the wildland-urban interface

May 15-16, 2018 | Alamosa, CO

Helping Communities Better Plan the Wildland-Urban Interface | www.planningforwildfire.org

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Workshop Information

Day 1 – Land Use Planning in the Wildland Urban Interface (WUI)

Tuesday, May 15

Alamosa County Services Center, 8900-A Independence Way, Alamosa

Intended audience:

County planners, administrators, land use officials, elected officials, firefighters, foresters and partners involved in land use decisions, fire and emergency management, and forestry around the wildland-urban interface.

Objectives:

- Learn about land use planning strategies to reduce wildfire risk.
- Understand the basics of wildfire risk in the built environment.
- Identify opportunities for your community and begin to develop an action plan.

Agenda		
8:30	**Welcome and introductions**	Kelly Pohl
8:45	**Trends in the Wildland-Urban Interface (WUI)**: Putting the San Luis Valley in Context	Kelly Pohl & Kimi Barrett
9:15	**WUI Risk Primer** • Defining WUI environments • Wildfire risk factors • Basics of structure ignition	Kelly Johnston
10:30	Break (snacks provided)	
10:45	WUI Risk Primer (continued)	
11:30	**Introduction to WUI Land Use Planning** • Roles and responsibilities • Planning tools • Codes & Ordinances • Risk assessments • Examples from other communities	Molly Mowery & Kelly Johnston
12:30	Lunch (provided)	
1:30	Introduction to WUI Land Use Planning (continued)	
2:30	**Getting Started in Your Community:** Interactive exercise on Comprehensive Plans • Developing Wildfire Policies • Common pitfalls • Tracking success	Molly Mowery & Kelly Johnston
3:30	Break (snacks provided)	
3:45	Getting Started in Your Community (continued)	
4:30	**Reflection and Wrap up**	Kelly Pohl
5:00	Adjourn	

Day 2 – The SLV Wildland-Urban Interface Environment

Wednesday, May 16

Alamosa County Services Center, 8900-A Independence Way, Alamosa

Intended audience:

County land use planners, administrators, foresters, fire officials, emergency management staff, and GIS specialists.

Objectives:

- Help calibrate and refine draft mapping tools of the wildland-urban interface.
- Tour wildland-urban interface sites in the San Luis Valley.
- Identify opportunities and challenges for reducing wildfire risk in the San Luis Valley, and outline priority actions for communities to explore.

Agenda		
8:30	**Welcome and introductions**	Kelly Pohl
8:45	**Wildland-Urban Interface Mapping Tools** • Overview of data • Demonstration of draft tool • Feedback and calibration	Headwaters Economics & Pete Magee
10:00	**Field Tour (with lunch stop)** Stopping at sites to see common WUI challenges and opportunities in the SLV.	Adam Moore, Rachel Baird, & Devin Hayne
2:00	**Evaluation of Opportunities & Challenges** Discussion and evaluation of SLV's successes, weaknesses, opportunities, and challenges to reducing wildfire risk in the wildland-urban interface.	Kelly Pohl
3:15	**Reflection and Wrap Up**	Kelly Pohl
3:30	Adjourn	

Background

COMMUNITY PLANNING ASSISTANCE FOR WILDFIRE

Together we can reduce wildfire risk in your community.

WHAT WE DO

Community Planning Assistance for Wildfire (CPAW) works with communities to reduce wildfire risks through improved land use planning. CPAW is a program providing communities with professional assistance from planners, foresters, economists and wildfire risk modelers to integrate wildfire mitigation into the development planning process. CPAW communities receive customized services, including:

LAND USE PLANNING

We provide communities with expertise in land use planning, forestry, and hazard mitigation to reduce wildfire risk.

RISK ASSESSMENTS

We help communities develop wildfire risk assessments to identify and prioritize areas of concern.

CAPACITY BUILDING

We offer workshops, trainings, and webinars to facilitate learning, networking, and skills development.

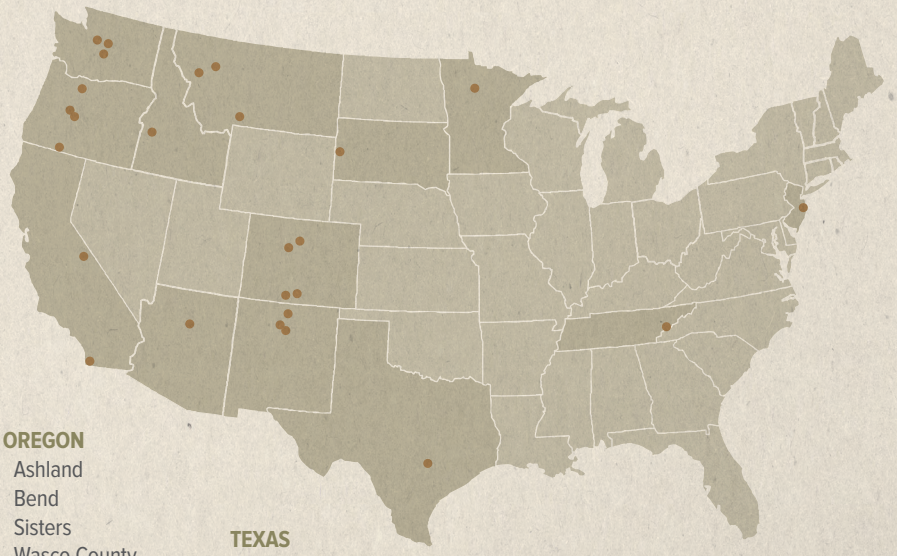
RESEARCH & SCIENCE

We help grow the larger body of knowledge supporting land use planning and wildfire mitigation in the wildland-urban interface

All services provided through CPAW come at no cost to the community. Implementation of recommendations is voluntary and under the authority of the local jurisdiction.

WHERE WE WORK

We work with and learn from communities at all scales and sizes across the United States. Communities apply through a competitive process to participate in CPAW. Since our founding in 2015, we have worked with 26 communities in 13 states.



ARIZONA
- Flagstaff

CALIFORNIA
- Mammoth Lakes
- San Diego

COLORADO
- Boulder County
- Huerfano County
- San Luis Valley
- Summit County

IDAHO
- Boise

MINNESOTA
- Bemidji

MONTANA
- Lewis & Clark County
- Missoula County
- Park County

NEW JERSEY
- Township of Ocean

NEW MEXICO
- Los Alamos
- Santa Fe
- Taos County

OREGON
- Ashland
- Bend
- Sisters
- Wasco County

SOUTH DAKOTA
- Deadwood

TENNESSEE
- Pigeon Forge

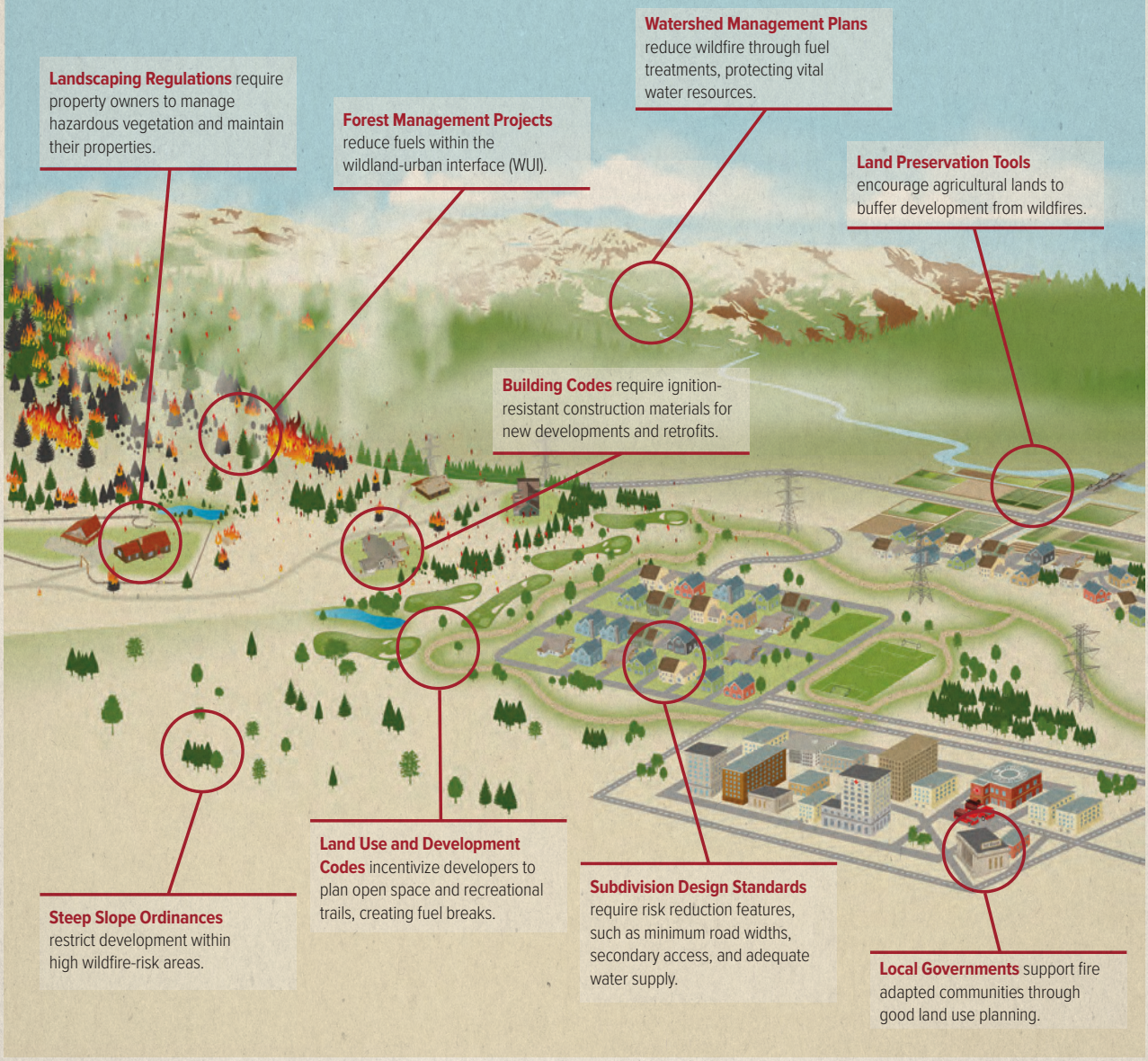
TEXAS
- Austin

WASHINGTON
- City of Chelan
- Chelan County
- Wenatchee

TOOLS

Land use planning tools to reduce wildfire risk are diverse and can help communities determine where to allow development, what types of building materials will help keep people safe, and what infrastructure is needed to safely respond when disasters strike. CPAW develops recommendations after multiple on-site assessments, ongoing stakeholder engagement, and extensive review of community documents.

EXAMPLES OF COMMUNITY TOOLS



COMMUNITY PLANNING ASSISTANCE FOR WILDFIRE

CPAW is a program of Headwaters Economics. We work in partnership with Wildfire Planning International, the U.S. Forest Service Rocky Mountain Research Station, and others to reduce wildfire risk through improved land use planning. It is funded by grants from the U.S. Forest Service, the LOR Foundation, and other private foundations. CPAW is an equal opportunity employer.

NATIONAL FIRE PROTECTION ASSOCIATION

The leading information and knowledge resource on fire, electrical and related hazards

TROUBLING TRENDS

More homes are being lost to wildfire...

...as the cost of wildfire suppression increases.

400
ESTIMATED NUMBER OF HOMES DESTROYED BY MAJOR WILDFIRES (ANNUAL AVERAGE)

◀ 1985 to 2000 ▶

$487.6m
AVERAGE ANNUAL COST OF FEDERAL WILDFIRE SUPPRESSION EFFORTS

1,354
ESTIMATED NUMBER OF HOMES DESTROYED BY MAJOR WILDFIRES (ANNUAL AVERAGE)

◀ 2001 to 2011 ▶

$1.25b
AVERAGE ANNUAL COST OF FEDERAL WILDFIRE SUPPRESSION EFFORTS

3,456
ESTIMATED NUMBER OF HOMES DESTROYED BY MAJOR WILDFIRES (ANNUAL AVERAGE)

◀ 2012 to 2016 ▶

$1.85b
AVERAGE ANNUAL COST OF FEDERAL WILDFIRE SUPPRESSION EFFORTS

6,831
ESTIMATED HOMES DESTROYED BY THE FIVE LARGEST CALIFORNIA WILDFIRES OF 2017 (AS OF DECEMBER 14)

◀ 2017 ▶

$2.7b
FEDERAL WILDFIRE SUPPRESSION COSTS FOR THE FISCAL YEAR 2017, WHICH ENDED SEPTEMBER 30—AN ALL-TIME RECORD

Source: National Interagency Fire Center, news reports. 2018.

https://www.nfpa.org/News-and-Research/Publications/NFPA-Journal/2018/January-February-2018/Features/Build-Burn-Repeat

WILDLANDS | INTERMIX | INTERFACE | OCCLUDED | EMBER ZONE

CONTINUUM OF WILDLAND TO URBAN DENSITIES

COMMUNITY PLANNING ASSISTANCE FOR WILDFIRE ©

WILDLANDS | RURAL | SUBURBAN | GENERAL RESIDENTIAL | URBAN / TOWN CENTER

Basics of Wildland Fire Behavior and the Wildland-Urban Interface

COMMUNITY PLANNING ASSISTANCE FOR WILDFIRE

Community Planning Assistance for Wildfire

Basics of Wildland Fire Behavior &
The
Wildland-Urban Interface

San Luis Valley Planning Workshop
May 2018

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Acknowledgements

The Community Planning Assistance for Wildfire program is a partnership between Wildfire Planning International and Headwaters Economics, and is funded through a cooperative agreement with the U.S. Forest Service and private foundations.

INTRODUCTION

Wildland fire occurs as a natural disturbance process to varying degrees of frequency and intensity in almost all of the vegetated ecosystems across North America. The vegetation (grasses, plants, trees) in these ecosystems contributes as fuel to these fires and can be referred to as *wildland fuels*. As a natural disturbance process, wildland fires are generally considered beneficial to most of the ecosystems they occur in; however, due to human presence and other human values derived from the land base, unplanned wildland fires are generally considered to have a negative impact and are referred to as *wildfires*. Man-made structures (buildings and infrastructure) and cultivated vegetation (landscaping) in and adjacent to these ecosystems also contribute as fuel to wildfires. These man-made structures can be referred to as *built fuels*. For simplicity purposes, we will refer to all vegetation (natural and cultivated) as *wildland fuels*. A wildfire involving both wildland fuels and built fuels is referred to as a *wildland-urban interface fire*.

TRAINING OBJECTIVES

This training will provide the participants with a basic introduction to:

1. Wildland and wildland-urban interface fire behavior;
2. The definition of the wildland-urban interface;
3. What makes structures/infrastructure and communities vulnerable to wildfire losses;
4. Defining wildfire hazard vs. wildfire risk;
5. How wildfire hazard and risk are assessed;
6. How wildfire risk can be reduced.

WHAT IS THE WILDLAND-URBAN INTERFACE?

Traditionally, the wildland-urban interface (WUI) is defined as[1]:

"The line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels. Describes an area within or adjacent to private and public property where mitigation actions can prevent damage or loss from wildfire." (See figures 1 and 2, below.)

[1] National Wildfire Coordinating Group (NWCG) Glossary of Wildland Fire Terminology: http://www.nwcg.gov/glossary/a-z

Figure 1 Traditional definition of the wildland-urban interface

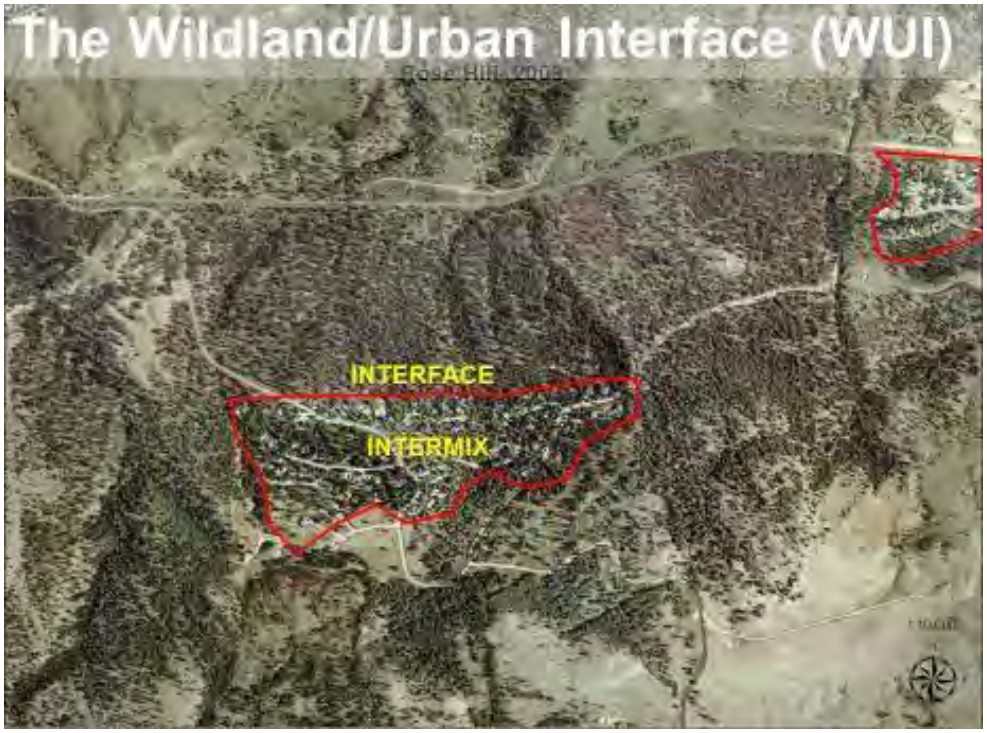


Figure 2. Traditional definition of the wildland-urban intermix

This definition works very well at "fitting" the WUI into a spatial "box" for planning purposes, but when we examine how fire spreads from wildland fuels to the built fuels and study the resulting losses, we find that **this traditional definition might not accurately define the true WUI.**

Two examples that visually explain this very well are the Horse River Fire (Ft. McMurray, Canada) in 2016 and the Waldo Canyon Fire (Colorado Springs, CO) in 2012. Both the photos of the Horse River Fire (Figure 3) and the Waldo Canyon Fire (Figure 4) show very clearly that structures were lost deep into the urban development area and well beyond what has been traditionally defined as the WUI. Note the significant barriers (roads), the lack of direct proximity of wildland vegetation, and the remaining green trees and vegetation adjacent to destroyed structures.

Figure 3 Horse River Fire (Ft. McMurray Canada) 2016

Figure 4. Waldo Canyon Fire (Colorado), 2012

To better explain these examples, which are representative of the majority of WUI occurrences where significant structure losses occur, Dr, Jack Cohen (USDA Forest Service- Retired) developed the "WUI Disaster Cycle" concept (below). This concept describes the events when a fire escapes the initial attempts to suppress it (Initial Attack) and its progression to structure involvement; multiple structure involvement and finally an urban conflagration where fire suppression resources are overwhelmed and disastrous losses occur. 92- 98% of wildfires are suppressed at the initial attack stage; it is that 2- 8% of fires that escape initial attack that are responsible for these large scale losses.

Figure 5. Jack Cohen's WUI Disaster Cycle concept

In reviewing examples like the Waldo Canyon Fire and the Horse River Fire, and reading through the following sections on "The Basics of Wildland Fire and WUI Fire Behavior," you will begin to understand that the WUI is not restricted just to the boundary where the forest meets structures; rather, the WUI extends well beyond that forest boundary, deep into urban development, and is dependent on a complex "set of conditions".

To reflect this complexity and for the purposes of CPAW, the wildland-urban interface is better defined as:

Any area where the combination of human development and vegetation have a potential to result in negative impacts from wildfire on the community.

THE BASICS OF WILDLAND FIRE AND WUI FIRE BEHAVIOR

Any substance that will ignite and combust (burn) is fuel. In a wildfire situation, the two main fuels we have defined are wildland fuels and built fuels. To understand how to define the WUI and the concepts used to assess and mitigate the WUI, the planner must first have a basic understanding of how fire ignites, spreads and behaves in its interactions with wildland and built fuels.

Wildland Fuels and Fire Behavior

For simplicity, we had previously defined wildland fuels to include wildland (natural vegetation and cultivated vegetation (landscaping). In regards to fire, there are three types of wildland fuel and three basic types of wildland fire (see Figure 5 and Figure 6):

- **Ground** fuel: includes all combustible substances below the surface litter of the organic soils. This is the fuel layer involved in *ground fires*.
- **Surface** fuel: includes all combustibles less than 39 inches (breast height) above ground level and one year's litter accumulation. This layer can include lower *ladder fuels***.** This is the fuel layer (and possibly the ground fuel layer) involved in *surface fires*.
- **Aerial (Crown)** fuel: all combustible material higher than 39 inches (breast height) above ground level. This layer can include upper ladder fuels. These fuels, along with the surface fuel layer (and possibly the ground fuel layer) are the fuels involved in *crown fires*.

Figure 6 Wildland Fuels Surface and Aerial (Ladder and Crown) Fuel

Figure 7 Wildland Fuels Ground Fuels and Mineral Soil

Crown fires require a combination of a threshold surface fire intensity and ladder fuels to develop and sustain them (the exception are those crown fires driven by very strong wind events combined with steep slope and/or extremely dry conditions). Surface fires can burn without involving the ground fuel layer—this is typically a winter or spring fire event.

Figure 8. Vertical fire transition to crown fire influenced by ground, surface, ladder and aerial fuel loadings and arrangements

The Fire Triangle

In order to control and successfully fight wildfires and WUI fires, we must first understand what makes fire spread.

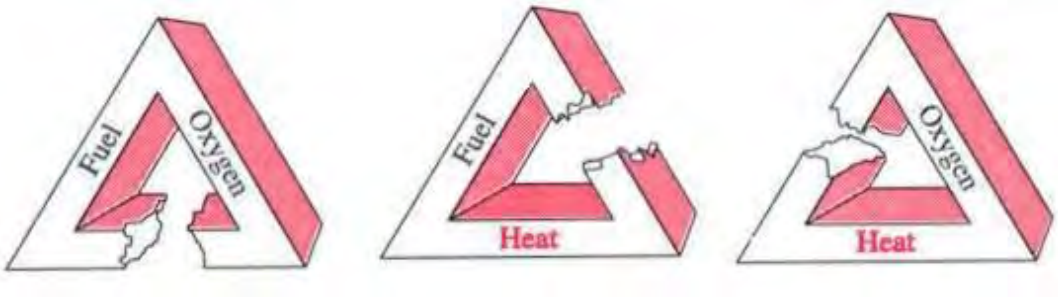
Three elements: *fuel*, *oxygen* and *heat* must be present to start and maintain a fire.

Fuel + Oxygen + Heat

In a wildland fire:

- Vegetation provides the fuel;
- Oxygen is in the air and;
- Heat results either naturally (lightning strike) or is introduced by people.

These three elements (fuel, oxygen, heat) are related to a triangle with each side representing one element. If any one of these elements is altered, the fire will behave differently; if one side of a triangle is removed, the fire extinguishes.



The Heat Transfer Process

Heat transfer process is the process by which heat travels from one body or object to another. There are three types of heat transfer processes:

Radiation: Transfer of heat through the air from warm surfaces to cooler surroundings (e.g., the heat you feel when you are sitting next to a campfire). Radiant heat from a crown fire or other individual significant heat sources (e.g., outbuildings, wood piles, single conifer trees, shrubs) burning at distances less than 30 feet from a structure with wood walls can ignite the structure walls and break single pane windows—allowing ember entry to the interior of the building.

Convection: Transfer of heat by the movement of a hot air mass, usually upwards (i.e., burning objects below heat objects above). Rising convection heat can be "tilted" by the wind and slope, and therefore can transfer heat to receptive wildland or built fuels adjacent to the fire, or upslope and beyond the influence of radiant heat.

Conduction: Transfer of heat through solid matter (i.e., objects touching each other). A good example of conduction heat transfer are burning embers, generated from wildland or built fuels, that are carried through the air by convection and wind for a few feet to several miles that subsequently land on wildland fuels or built fuels. Embers are responsible for approximately 50% of structure ignitions in WUI fires.

Factors Influencing Wildland Fire Behavior

There are three key factors that influence wildland fire behavior:

Key Factors		
1. Fuel	2. Weather	3. Topography
Moisture	Wind	Slope
Size	Precipitation	Aspect
Spacing (continuity)	Relative Humidity	Terrain
Fuel Loading	Temperature	Elevation

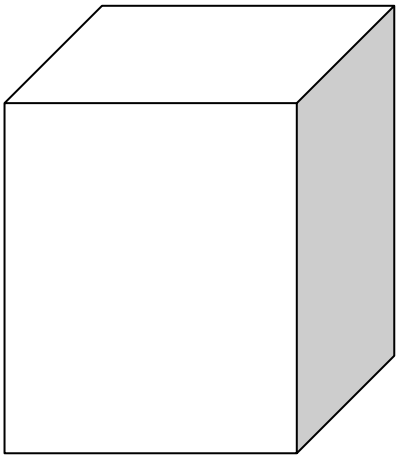
Wildland Fuels and Fire Behavior

Fuel Moisture

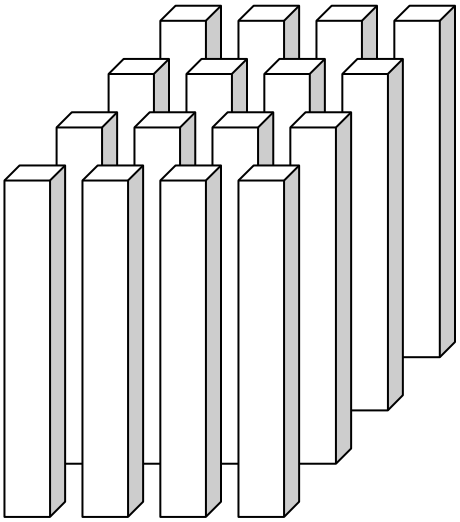
Fuel moisture content is the single most important fuel-related factor affecting fire behavior. Fire will ignite easier and spread faster in fuels with lower fuel moisture. Fuel moisture in wildland fuels is determined by:

- Weather related factors affecting the amount of moisture in the fuel. For example, the amount and type of precipitation (e.g., rain, snow);
- Percentage of live or dead (cured) fuel. For example, green grass will not burn as well as brown grass.

Fuel Size



Surface Area = 6 m²



Surface Area = 18 m²

Heavy, slow-burning fuels include logs, stumps, large branch wood, trees and deep duff. These fuels take longer to ignite (due to moisture content), and fires spread slowly but burn longer with greater intensity. The moisture content change is slower due to a low surface area to volume ratio.

Light, fast-burning fuels include grass, dead leaves, tree needles, brush and small trees. They ignite quickly, result in fast spreading fires and act as kindling to light heavier fuels. The moisture content change is faster due to a high surface area to volume ratio.

Fuel Spacing (Continuity)

Fuel spacing refers to the arrangement of fuel on the landscape and can be considered as the fuel distribution in the horizontal and vertical directions. Fuel closer together increases the ability of fire to spread, while fuel spaced further apart decreases the ability of fire to spread.

Horizontal Fuel Spacing is usually described as “continuous” or “patchy”.

Vertical Fuel Spacing refers to the distance between surface fuels and aerial fuels. Fuels present between these two fuels are called *ladder fuels***.**

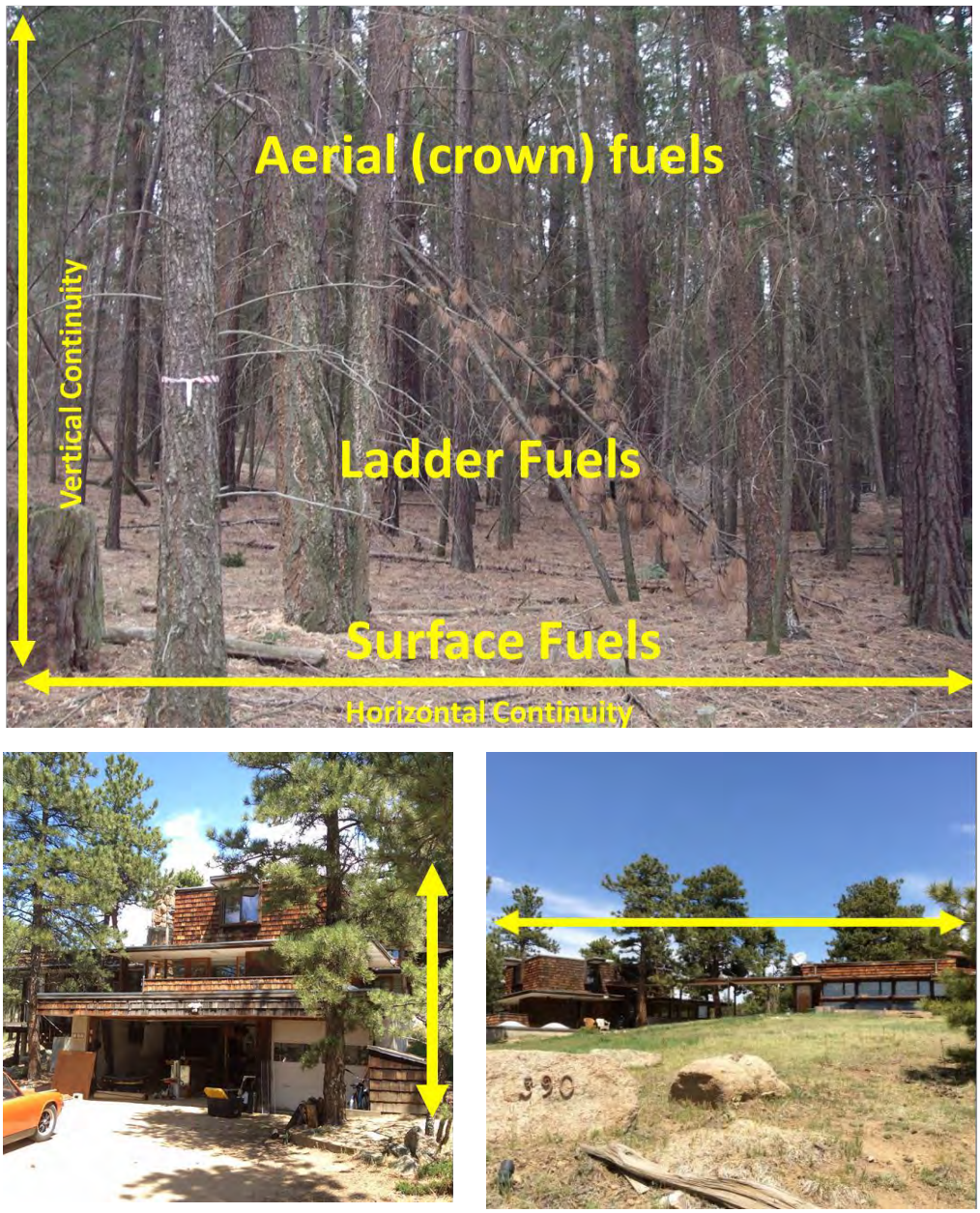


Figure 9. Horizontal fuel continuity in wildland fuels and a WUI fuel complex

Figure 10. Horizontal continuity at the community level WUI fuel complex

Fuel Loading

Fuel loading refers to the weight or mass of fuels in a given area, usually measured in tons per acre. Fuel loads may vary across the landscape. Higher density fuel loads will burn at higher intensities if fuel moisture conditions make all the fuel available for combustion.

Individual Plant Flammability Characteristics

Characteristics of Fire Resistant Plants:

- Moist, supple leaves
- Little dead wood and tendency not to accumulate dead material
- Water-like sap with little or no odor
- Low amount of sap or resin material

Characteristics of Highly Flammable Plants:

- Contain fine, dry, dead material within the plant
- Plant stem, branches and leaves contain volatile waxes, terpenes or oils
- Leaves are aromatic
- Gummy, resinous sap with a strong odor
- Loose papery bark

Weather

Wind

Wind is the single most important weather factor affecting fire behavior and influences fire behavior by:

- Increasing or decreasing fuel moisture
- Bending the flames and convective heat ahead, heating, drying and igniting new fuels
- Carrying embers into new fuel sources (spotting)
- Feeding more oxygen to a fire
- Driving the direction of a fire

Precipitation

Precipitation influences fire behavior by affecting fuel moisture. The effect of precipitation on fuel moisture is mostly dependent on fuel size:

- Less precipitation is required to raise the fuel moisture content in fine fuels than in heavy fuels;
- Fine fuels will dry out faster heavy fuels;
- Precipitation may not wet ground fuels if they are located under a dense canopy;
- Duration of precipitation, not quantity, is the most important factor determining the effect of precipitation on fuel moisture.

Relative Humidity

Relative humidity influences fire behavior by affecting fuel moisture. Relative humidity is the percentage of water vapor present in the air. When the air is dry (low relative humidity), fuels are likely to dry out; when the air is damp (high relative humidity), fuels are likely to absorb moisture (fuel moisture increases). Typically, the relative humidity will increase overnight and decrease during the day.

Temperature

Temperature fluctuations affect relative humidity, thereby affecting fuel moisture. To a lesser degree, temperatures also influence the amount of preheating required to bring fuel to its ignition temperature.

Topography

There are four topographical factors that influence fire behavior:

- Slope
- Aspect
- Terrain
- Elevation

Slope

Slope is the single most important topographical factor affecting fire behavior. Slope affects fire behavior in the following ways:

- Flames are closer to fuels on the uphill side, heating and igniting these new fuels;
- Convective heat (rising heat) from the fire travels up the slope, heating and drying new fuels;
- The convective air may carry firebrands, which can ignite spot fires above the main fire;
- Burning embers and large burning material may roll downhill, igniting new, unburned materials below the fire;
- Firefighting efforts are hampered and slowed on slopes;
- Cooling at night and weather changes can cause winds to blow down slope.

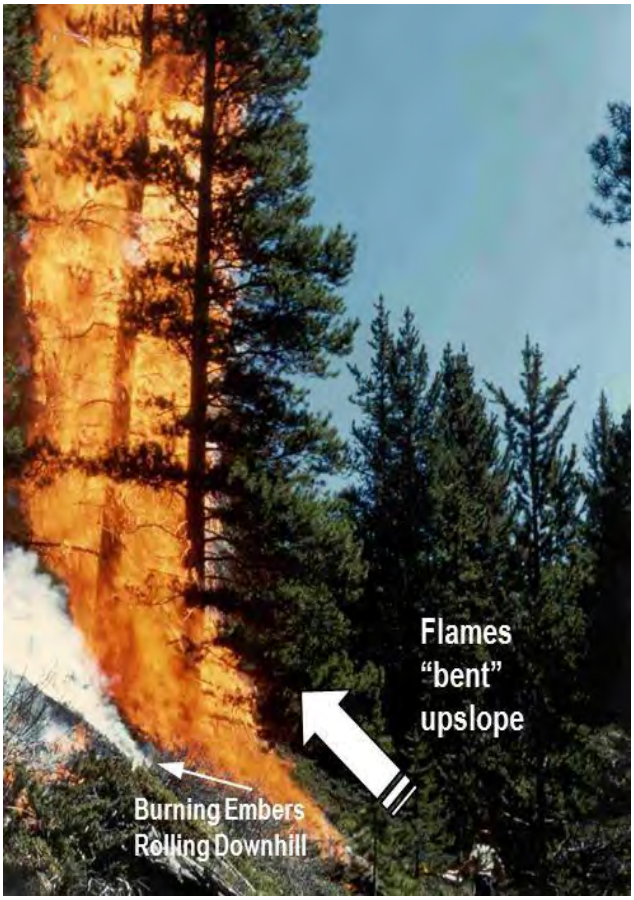


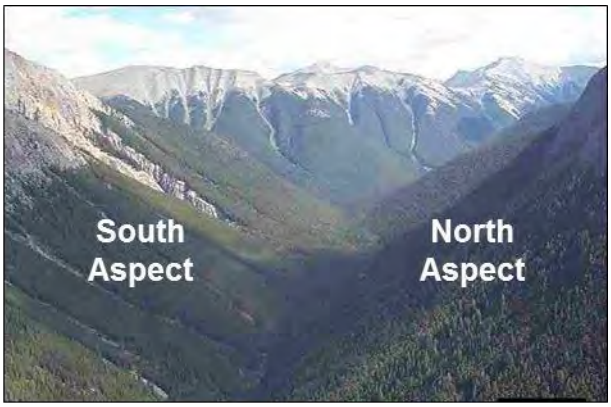
Figure 11. Slope influence on fire

Aspect

Aspect refers to the direction the slope faces. For example, a southwest aspect is a slope that faces southwest. The following aspect factors affect fire behavior directly:

- Southern slopes receive the most direct heat from the sun and therefore have higher temperatures;

- Fuels on south facing slopes typically have the lowest fuel moisture.



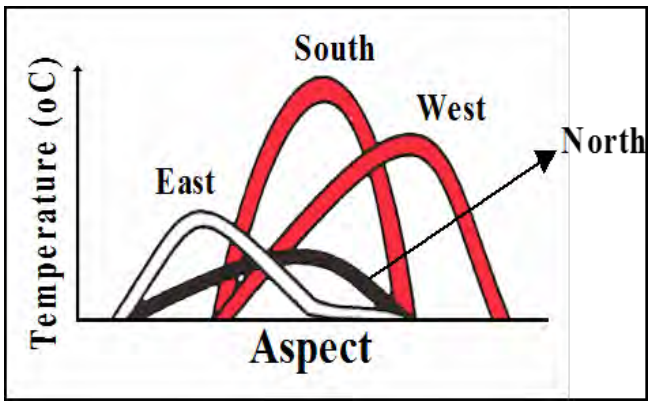


Figure 12. Aspect influence on fire

Terrain

Terrain is the variation in land features, which primarily affects fire behavior by altering wind direction and speed at a local level. It is useful to think of the wind patterns over terrain as water flowing in a river. Terrain affects wind patterns in the following ways:

- Turbulence or "eddies" can be generated on the leeward side when wind blows across ridges;
- Terrain restrictions, such as narrow portions of valleys, or knolls, can increase wind speed as the wind passes through, or around these restrictions;
- Steep-sided gullies or canyons running uphill can create a "chimney effect," dramatically increasing uphill spread rates and intensity. In many cases these terrain features will also have heavy fuel loadings, increasing fire behavior.

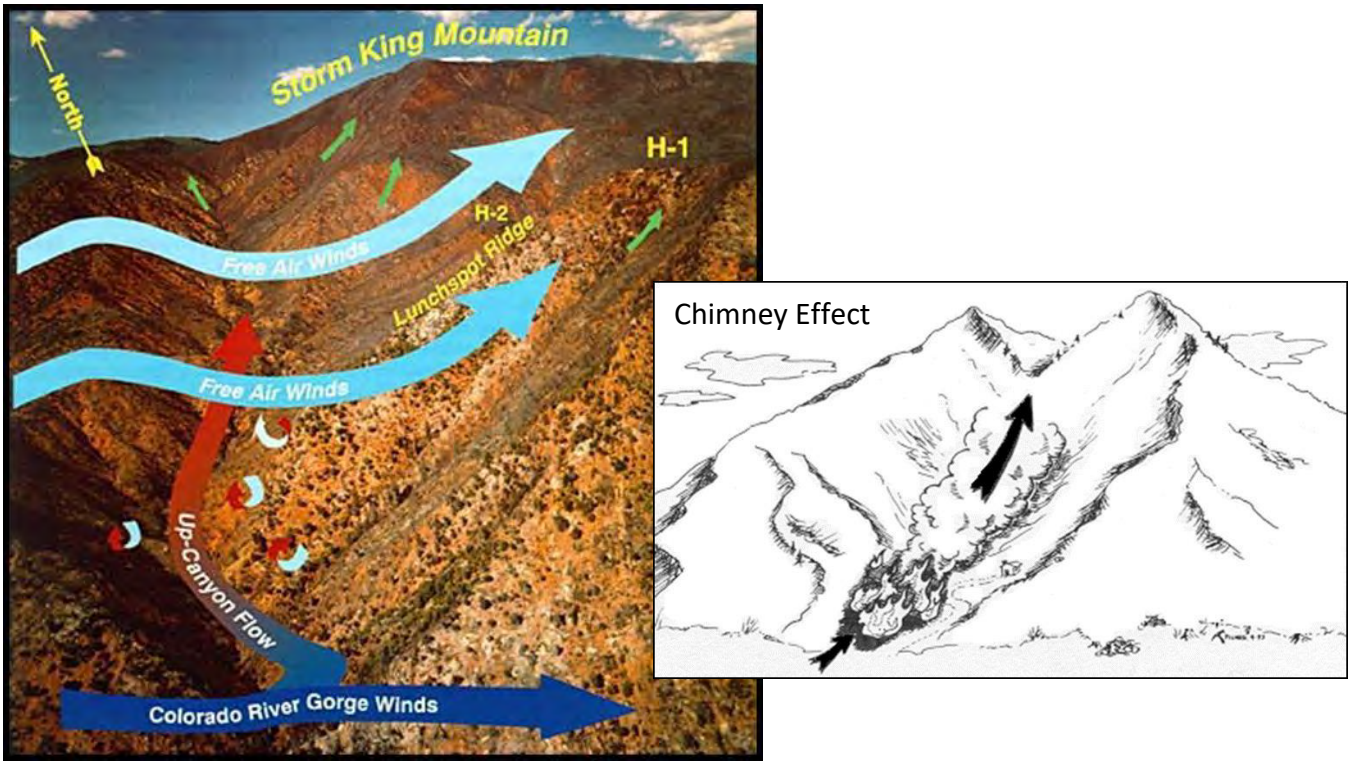


Figure 13. Terrain influence on winds and fire

Elevation

Typically, air temperatures follow an elevation gradient with temperatures being warmer at lower elevations and cooler at higher elevations. Quite often, atmospheric conditions will cause a band of warm air to be trapped at mid- elevation between cool air at lower elevations and cool air above. In mountainous terrain this is a temperature inversion known as a thermal belt. Within the thermal belt, temperature will be higher and relative humidity will be lower than the elevations above and below, possibly creating extreme fire conditions when unexpected

BUILT FUELS AND FIRE BEHAVIOR

Built fuels include man-made structures that are important components of a community and are vulnerable to damage or loss through combustion during a WUI fire event. Some examples are buildings, attachments (e.g., decks, fences), utility poles and bridges. The main focus on fire behavior and built fuels is buildings—typically homes—however, business and infrastructure losses can be significant during a WUI fire and many of the same ignition concepts can be applied to them as well.

Structure Vulnerabilities

Roof Assembly

During a wildfire or urban structure fire event, the roofs of structures can collect airborne burning embers and combustible debris. If the roof is constructed of flammable material it is highly susceptible to ignition from these embers. A large percentage of homes that burned in wildfires are a result of these roof ignitions.

Dormers and Walls Above Lower Roofs

Airborne embers and combustible debris can collect in the wall/roof junctions at the base of walls extending above roofs. The "piling up" of these embers in this junction can ignite combustible siding, or ignite the combustible wall assembly behind non-combustible siding on any exposure of the building, thereby igniting the walls, or combustible material behind the walls of a structure.

Roof and Soffit Vents

Roof and soffit vents required to vent attics can provide openings for airborne embers to enter the attic spaces of homes and ignite combustible material in the attic space.

Gutter and Downspout Assembly

Airborne embers and combustible debris can collect in gutters and downspouts. Burning embers and debris can melt the gutters and downspouts and drop burning material to the base of the structure walls and combustible surface vegetation and materials below the gutter assembly.

Structure Walls

Radiant heat from adjacent burning wildland fuels or structures can ignite combustible exterior structure walls. In addition, airborne embers piling against the base of structure walls at the junction of structure walls and the surrounding finished grade can ignite exterior combustible siding, or the combustible wall assembly behind non-combustible siding.

Windows

Windows can crack and become displaced from window frames when exposed to the radiant heat generated from adjacent burning vegetation or adjacent structures, or the convective heat generated from fires burning downslope of a structure. This can create an opening for airborne embers to enter the structure and ignite interior combustible materials. Although all windows are susceptible to failing, single pane windows have been documented to fail sooner than thermal pane windows.

Attachments and Outbuildings (within 30 feet of structure)

Attached and detached decks, porches, carports, garages and outbuildings within 30 feet of main structures are considered attachments and can be the source of fire spread to the main structure. Deck and porch surface junctions with combustible siding walls can collect embers and combustible debris, igniting the structure walls. The area under decks and carport with combustible surfaces, vegetation or other combustible materials can ignite the deck structure from below which in turn can spread to the main structure. Attached or detached out buildings are susceptible to the same wildfire exposures as the main structure. Radiant heat generated from structures within 30 feet of the main structure can generate enough radiant heat to ignite combustible siding and break windows (allowing ember interior entry), resulting in ignition of the main structure.

Wood Fences

Wood fences attached to structures can act as a "wick"—allowing fire to spread along the fence

to the structure and ignite the structure.

Structure Location on Slope

Structures situated mid-slope or at the crest of a slope can be impacted by both the convective heat and embers generated by fires burning below the structure. This will increase the risk of the structure igniting.

Structure Density

Recall that structures need to be considered as fuel themselves; and therefore can contribute to the ignition and spread of fire to vegetation and other structures. Communities with dense structure layouts can facilitate a wildland-urban interface fire transitioning to an urban conflagration (i.e., fire spread from structure to structure) within the community, or vice versa.

REVISITING THE DEFINITION OF THE WUI

Through examples and a basic knowledge in wildland and WUI fire behavior and understanding the WUI Disaster Cycle, we can clearly see that the WUI is not restricted just to the boundary where the forest meets structures; in fact, it extends well beyond that boundary and deep into urban development and is dependent on a complex "set of conditions". As previously stated, , the wildland-urban interface is better defined as:

Any area where the combination of human development and vegetation have a potential to result in negative impacts from wildfire on the community.

SPATIALLY DEFININING THE WUI

It is clear that the WUI is a set of conditions; however, it must still be spatially displayed in order to support land use planning decisions and regulations.

The SILVIS Lab approach originating from the Federal Registry[2] spatially defines the WUI based on the following criteria:

1. Housing density
2. Landcover[3]
    - **WUI Intermix**: Areas with ≥6.18 houses per km^2 and ≥50 percent cover of wildland vegetation
    - **WUI Interface:** Areas with ≥6.18 houses per km^2 and <50 percent cover of vegetation located <2.4 km of an area ≥5 km^2 in size that is ≥75 percent vegetated
    - **Non- WUI Vegetated (no housing):** Areas with ≥50 percent cover of wildland vegetation and no houses (e.g., protected areas, steep slopes, mountain tops)
    - **Non-WUI (very low housing density):** Areas with ≥50 percent cover of wildland vegetation and <6.18 houses per km^2 (e.g., dispersed rural housing outside neighborhoods). **NOTE: THIS SHOULD BE CONSIDERED AS WUI INTERMIX!**
    - **Non-Vegetated or Agriculture (low and very low housing density): Areas with** <50 percent cover of wildland vegetation and <49.42 houses per km^2 (e.g., agricultural lands and pasturelands). **NOTE: THIS SHOULD BE CONSIDERED AS WUI IN EMBER ZONES!**
    - **Non-Vegetated or Agriculture (medium and high housing density): Areas with** <50 percent cover of wildland vegetation and ≥49.42 houses density per km^2 (e.g., urban and suburban areas, which may have vegetation, but not dense vegetation). **NOTE: THIS SHOULD BE CONSIDERED AS WUI IN EMBER ZONES!**

[2] USDA and USDI. 2001. Urban wildland interface communities within vicinity of Federal lands that are at high risk from wildfire. Federal Register 66:751–777.

[3] Schlosser, W.E. 2012. Defining the Wildland-Urban Interface: A Logic-Graphical Interpretation of Population Density. Kamiak Ridge, LLC

WUI HAZARD AND WUI RISK

All too often, the terms *WUI hazard* and *WUI risk* are used as interchangeable terms, or even combined to create the term "*WUI hazard risk"***.** It is important to understand the difference between these two terms and use them appropriately in the community wildfire planning context.

WUI Hazard

The term *WUI hazard* is appropriately used in the context of describing the combination of the likelihood of a fire occurring and the intensity of the fire the wildland or built fuels present in a given area, or the combustibility of a given fuel type or fuel complex in general. Factors influencing the WUI hazard assessment may include:

- Wildland fuel models or fuel structure (distribution, size, loading, etc.)
- Built fuel vulnerability assessment (roof, walls, windows, fences, etc.)
- Historical fire cause and location (human vs lightening)
- Historical fire size
- Historical weather and fire season
- Historical wildland fire suppression success

WUI Risk

The term *WUI risk* describes the *WUI hazard* along with the factors that contribute to the susceptibility, or impact on highly valued resources and assets of a WUI fire occurring. Factors that contribute to the *WUI risk assessment* may include:

- Population demographics
- Public safety
- Ember transport modeling
- Structure and infrastructure vulnerability
- Natural resource values and vulnerabilities
- Watershed vulnerability
- Socio-economic values

Figure 14. The wildfire risk triangle

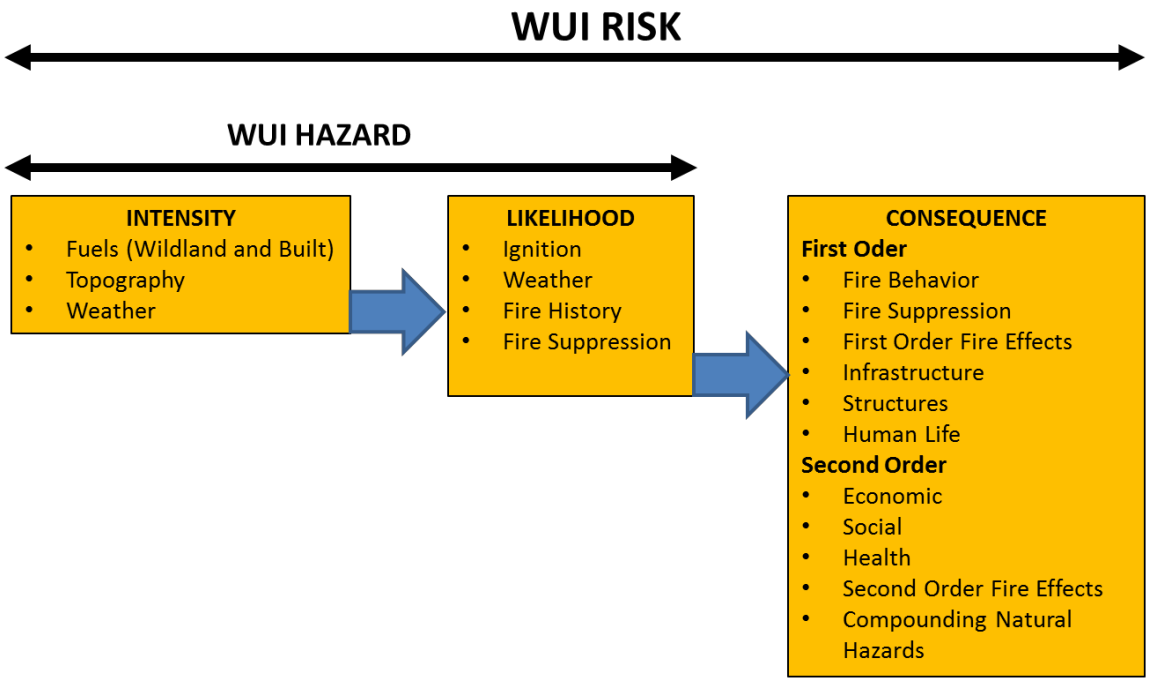


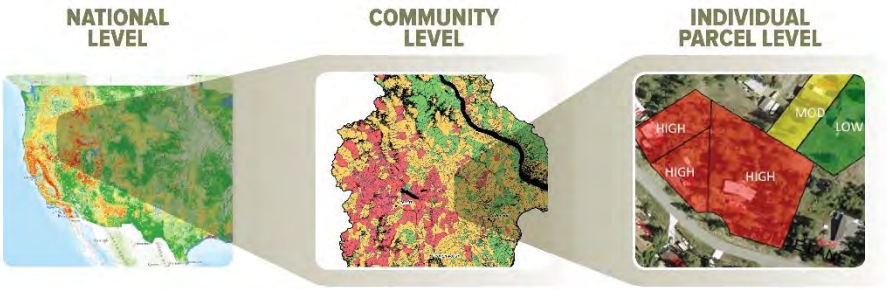
Figure 15. WUI Risk relationship to WUI hazard

A Special Caution Regarding Fire Response Capabilities

The fire response capabilities of a community (e.g., water source, response time, fire stations, fire apparatus) are often included as factors into a risk assessment. While the response capability is extremely successful during the initial attack phase of a wildfire, or in response to an isolated structure fire, these resources are almost always and immediately overwhelmed once either of these scenarios transition into a WUI fire involving wildland fuels and multiple structures. Once this transition is made, the success of reducing losses relies almost solely the mitigation and resiliency of the remaining factors. We therefore should approach the use of response to influence the WUI risk assessment.

WUI RISK AND WUI HAZARD ASSESSMENTS

It is important to know that WUI and wildfire risk assessments are developed for different purposes and scales of reference. The scale and purpose of a landscape level assessment must be appropriate to provide context for a community level assessment and a community level assessment must be at a scale to support Structure Ignition Zone level assessments.



SUPPORTING WUI HAZARD AND RISK ASSESSMENT WITH GIS

GIS has become a very integral and powerful tool used to support the analysis and spatial representation of WUI hazard and WUI risk. There are a number of GIS based wildfire hazard and risk assessment products available. Be sure to answer the following questions when selecting the appropriate GIS assessment product:

- Is the assessment tool scale appropriate for your use (e.g., is it a landscape level vs parcel level assessments)?
- Is the data used and outputs of the assessment tool appropriate for the information you require? (e.g., are appropriate factors used? Is it a risk or hazard output? Is it for wildfire or WUI? Does it assess the "set of conditions"?)
- What is the accuracy of the data used in the assessment tool (e.g., how up to date is that data? What are the sources?)

Land Use Planning Tools

Opportunities for Linking Wildfire in Land Use Planning Tools

This document defines different land use planning tools, and describes different opportunities to link them to wildfire. For more information about land use planning tools to reduce wildfire risk, visit https://planningforwildfire.org.

PLANS

Policy documents created by multiple stakeholders and a public input process which provide analysis and specify future actions to achieve desired outcomes.

Comprehensive Plan (also referred to as General Plan, Growth Policy, or Master Plan)

A community's foundational local policy document that guides long-term planning decisions for growth and change. Plans include an analysis of existing conditions and future trends, and provide goals and policies to implement a community's vision for the future.

- ✓ Include goals, objectives, and policies that address local wildfire planning issues. Topics should include community safety, resilient housing, disaster preparedness and recovery, the role of fire on the landscape, and protection of natural resources.
- ✓ Ensure policies to address wildfire are compatible with other policies, such as where growth is planned to occur in the community.
- ✓ Reference other plans, such as the Community Wildfire Protection Plan, to provide readers with additional sources of information on wildfire.

Sub-Area Plan

Detailed plans prepared for a smaller geographic area within a community (e.g., downtowns, special districts, neighborhoods).

- ✓ Include actions that address wildfire based on unique geographic conditions.
- ✓ Ensure sub-area policies are compatible with wildfire risk reduction objectives (e.g., design guidelines, tree preservation requirements).

Functional Plan

Topic-specific plans that are not geographically constrained to a subarea of a community (e.g., transportation, capital improvements, community forestry, trails and open space, post-disaster, sustainability/ resiliency plans).

- ✓ Identify opportunities to include wildfire-related information and actions to further the goals of the plan (e.g., trails and open space plans can incorporate vegetation management to reduce hazardous fuels/ wildfire conditions near neighborhoods).
- ✓ Reference other plans that provide additional wildfire information and policies/actions (e.g., Community Wildfire Protection Plan).
- ✓ Align project spending with land use policies that promote investment in "safe growth" areas or reduce future wildfire risk.

Community Wildfire Protection Plan (CWPP)

A community-developed functional plan focused specifically on wildfire hazard. Must meet minimum requirements of the Healthy Forests Restoration Act, and may be implemented at different scales. Can be adopted as part of the Hazard Mitigation Plan (see below).

- ✓ Align policies and actions align with the Hazard Mitigation Plan and Comprehensive Plan.
- ✓ Include local land use planning staff on the development and update of city and county CWPPs.
- ✓ Link wildfire risk reduction actions with land use planning decisions, such as the location of future development and building regulations for reducing structural ignitability.

Hazard Mitigation Plan (HMP) (also referred to Pre-Disaster Mitigation Plan)

FEMA-approved plans that identify a community's local hazards and associated risks, potential mitigation actions, community capacity, and a prioritization of hazard mitigation projects. Often developed at the county level in coordination with local jurisdictions.

- ✓ Align mitigation actions with the CWPP and Comprehensive Plan.
- ✓ Include local land use planning staff on plan development and update committee.
- ✓ Link wildfire risk reduction actions with land use planning decisions, such as the location of future development and building regulations for reducing structural ignitability.

CODES & REGULATIONS

Legally-binding requirements as designated by an authority to implement a specified action or set of actions. Development and implementation of codes and regulations is based on applicable local, state, and federal legislation.

Building Code

Sets of regulations governing the design, construction, alteration, and maintenance of structures. Minimum requirements are intended to adequately safeguard the health, safety, and welfare of building occupants.

- ✓ Require fire-resistant building materials and construction techniques to address wildfire vulnerabilities (e.g., windows, doors, roofs, siding, vents, decks/attachments).
- ✓ Always check with state laws to determine if local jurisdiction can adopt more stringent requirements to address wildfire hazard.

Fire Code

Set of regulations prescribing minimum requirements to prevent fire and explosion hazards, ensure life safety and provide fire access and water supply; often works in conjunction with building code.

- ✓ Provide minimum requirements for fire response access (e.g., road/driveway widths, grades, turnarounds) and firefighting water supply requirements (e.g., hydrants, minimum fire flow).
- ✓ Include life safety requirements (e.g., refuge areas and escape, usually within buildings).
- ✓ Include minimum requirements to prevent fire spread between buildings.
- ✓ Include minimum requirements for hazardous uses (e.g., chemical warehouses).
- ✓ Check for overlap or conflict between building codes, WUI Code, and subdivision regulations.

Wildland-Urban Interface (WUI) Code

Standalone code, ordinance, or set of regulations that compile and establish minimum requirements to address wildfire hazard in designated wildland-urban interface areas. Typical topics include vegetation management, construction, water supply, and access.

- ✓ Designate wildland-urban interface based on a defensible process.
- ✓ Ensure code addresses ignition vulnerabilities at building, lot, and neighborhood scales.
- ✓ Model codes are available that provide most recent standards based on ignition science and testing; local amendments should reflect jurisdiction's objectives for risk reduction.

Land Use and Development Code

Implements the goals and policies of the Comprehensive Plan by regulating how property is used and developed within a jurisdiction. Jurisdictions create land use codes differently, which may include Subdivision Regulations and Zoning Regulations (see below).

- ✓ Specify development standards that establish unique requirements for areas subject to wildfire hazard (unless specifically addressed in another code administered by the jurisdiction).
- ✓ Adopt language for a review and referral process to perform required mitigation.
- ✓ Align with other development requirements, such as landscaping, fencing, and screening, to avoid regulatory conflicts.

Subdivision Regulations

Standards for dividing land into lots or parcels to make the property suitable for development. Regulations typically include requirements for drawing and recording a plat and necessary public improvements such as adequate streets, utilities, drainage, and vehicular access.

- ✓ Require applicants to identify wildfire hazard areas at early stage in approval process to determine if mitigation is necessary.
- ✓ For identified hazard areas, require applicants to submit and perform vegetation management by qualified professionals prior to approval.
- ✓ For identified hazard areas, require detailed drawings that identify multiple points of egress, adequate water supply, and any other conditions as required by local fire protection district.

Zoning Regulations

Standards to govern the use of land, and the location, size and height of buildings. Zoning divides a jurisdiction into multiple districts, with each district containing a distinct set of regulations that are uniformly applied to all property with the district.

- ✓ Require conditional use permits rather than permitting them by-right for unique land uses in identified hazard areas (e.g., location of hazardous materials would require additional setbacks and mitigation).
- ✓ Ensure landscaping standards are compatible with wildfire hazard mitigation requirements.
- ✓ Require site plan review and on-site assessments for development in identified hazard areas to ensure wildfire mitigation is incorporated into the development review and approval process.

Comprehensive Plan Examples

Chapter 1: Goals, Objectives, and Policies

The 2035 Long Range Transportation Plan (2035 Plan) is guided by a set of goals, objectives and policies drawn from a variety of sources. One basis for these is the previous version of the Plan, known as the 2025 Plan. This Plan was adopted in 2004 and was last amended in 2007 to conform to the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). As the primary federal funding mechanism, SAFETEA-LU specifies eight planning factors that all Metropolitan Planning Organizations (MPOs) must address. A matrix is available as a supporting document showing the relationship of the 2035 Plan's Goals, Objectives and Policies to these federal planning factors.

In addition, numerous state, regional and local transportation plans and studies, produced since the adoption of the 2025 Plan, were reviewed and critical issues and concerns were highlighted. These plans and studies are shown in Table I.1 in the Introduction.

Early in the 2035 Plan's development, the MPO's Citizens Advisory Committee, Technical Advisory Committee, Bicycle/Pedestrian Advisory Committee and Livable Roadways Committee reviewed and suggested changes to the Goals, Objectives and Policies. The MPO Policy Committee held a workshop and developed a vision statement and made further refinements. Subsequently, the entire MPO voted to approve the vision statement's updated goals, objectives and policies in February 2009. Later in the 2035 Plan's development, these goals and objectives were used to help prioritize future projects for funding.

Contents

Goal I *Improve the quality of life, promote energy conservation and enhance the environment, while minimizing transportation-related fuel consumption, air pollution and greenhouse gas emissions.*

Objective 1.1 **Use appropriate planning and design criteria to protect and enhance the built and natural environment.**

Policy 1.1A: Select new road alignments that avoid cutting through or fragmenting environmentally sensitive areas, including wildlife corridors, parks, trails, marshes or wetlands.

Policy 1.1B: Plan and design new and expanded multi-modal transportation facilities and new roadway alignments that respect and preserve scenic, historical, archaeological or water resources and other sensitive habitats, and protect the character of designated rural areas.

Policy 1.1C: Apply environmentally sensitive design concepts to appropriate roadway widening and multi-modal projects located within the urban service area.

Policy 1.1D: Promote proper environmental stewardship and mitigation practices to restore and maintain environmental resources that may be impacted by transportation projects.

Objective 1.2 **Minimize the use of fossil fuels and improve air quality.**

Policy 1.2A: Give incentives to use transit, biking, walking and transportation demand management (TDM) practices such as carpooling and telecommuting to reduce fuel consumption.

Policy 1.2B: Promote the use of alternative fuels and technologies in motor vehicles, fleet and transit applications to reduce greenhouse gas emissions.

Policy 1.2C: Promote the reduction of energy consumption on a system-wide basis, and the use of more renewable sources of energy such as solar, wind and biomass.

Policy 1.2D: Comply with all federal and state air quality standards, and pursue strategies to reduce greenhouse gas emissions from transportation sources in Hillsborough County and the Tampa Bay region.

Goal II *Support economic vitality to foster the global competitiveness, productivity and efficiency of local and regional businesses.*

Objective 2.1 Promote regional and local cooperation on transportation issues and needs.

Policy 2.1A: Cooperate with the Tampa Bay Regional Transportation Authority (TBARTA) and the West Central Florida MPO Chairs Coordinating Committee (CCC) to advance a regional rail system and other major multi-modal transportation improvements within the region.

Policy 2.1B: Establish regional multi-modal transportation priorities, and improve regional intermodal travel and movement of goods.

Policy 2.1C: Encourage integration of activities for funding, programming and coordinating regional multi-modal transportation projects.

Policy 2.1D: Improve connectivity between Strategic Intermodal System (SIS) transportation corridors, freight facilities and major economic centers.

Policy 2.1E: Support policies to ensure that facilities and services are provided concurrently with development, and meet local level of service (LOS) standards.

Policy 2.1F: Ensure compatibility with the multi-modal transportation facilities and programs such as Intelligent Transportation Systems (ITS) of adjacent jurisdictions and resolve differences among the jurisdictions.

Policy 2.1G: Consider the use of tolls, user fees and innovative funding for regional projects.

Objective 2.2 Relieve congestion and improve traffic flow.

Policy 2.2A: Identify and promote multi-modal improvements in congested corridors to reduce vehicle miles traveled (VMT), including bus service, rapid transit, bicycle/pedestrian facilities and managed lanes (e.g., High Occupancy Vehicle (HOV) or High Occupancy Toll (HOT) lanes).

Policy 2.2B: Support high capacity transit systems in areas with high density, constrained roads and congested corridors.

Policy 2.2C: Promote multi-modal TDM strategies that spread out or reduce the growth in peak hour vehicle travel through programs such as carpooling, telecommuting and flexible work hours.

Policy 2.2D: Support transportation system management (TSM) including intersection improvements, ITS and other strategies to improve traffic flow, particularly on constrained roadways, congested corridors and at key traffic bottlenecks.

Policy 2.2E: Manage congestion near ports, airports, rail facilities and economic activity centers.

Policy 2.2F: Improve response time for non-recurring incidents on congested corridors.

Objective 2.3 Support community education and involvement in transportation planning.

Policy 2.3A: Engage the public in workshops, public hearings, surveys and other methods to encourage awareness and participation.

Policy 2.3B: Communicate with the public on planning issues in a clear and concise manner, and collaborate with the public throughout the development of multi-modal transportation plans.

Policy 2.3C: Make project information and plans interesting and available to the public through the internet, follow the MPO's Limited English Proficiency Plan to ensure that materials are reasonably accessible to persons with disabilities and language barriers and use visual images to describe MPO plans.

Policy 2.3D: Ensure that plans respond to the diversity of community needs.

Policy 2.3E: Encourage early public involvement in the planning and design of proposed transportation projects.

Objective 2.4 Incentivize private-sector and community transportation investments.

Policy 2.4A: Pursue private-public partnerships and provide incentives for private sector participation in the funding, design, right-of-way acquisition, construction and operation of multi-modal transportation improvements.

Policy 2.4B: Partner with the community to invest in transportation enhancements such as transit stations, intermodal terminals, toll roads and TDM programs.

Goal III *Promote accessibility and mobility by increasing and improving multi-modal transportation choices, and the connectivity across and between modes, for people and freight.*

Objective 3.1 **Maximize access to the transportation system and improve the mobility of the transportation disadvantaged.**

Policy 3.1A: Provide facilities that are compliant with the Americans with Disability Act (ADA) and amenities that support all users of the multi-modal transportation system, including persons with disabilities, the elderly and economically disadvantaged (such as new sidewalk connections, trails and enhanced bus stops/shelters).

Policy 3.1B: Improve or expand the multi-modal transportation system serving the disadvantaged by enhancing service availability, and providing greater access to connecting bicycle and pedestrian facilities.

Policy 3.1C: Promote paratransit or alternative services where development patterns do not support fixed route transit.

Objective 3.2 **Decrease reliance on single-occupancy vehicles.**

Policy 3.2A: Plan for and develop a "transit-friendly" transportation system providing appealing choices that are more competitive with automobile travel.

Policy 3.2B: Increase the percentage of persons using alternative modes, especially during peak hours, through planning implementable multi-modal projects, and connections between them.

Policy 3.2C: Promote and expand TDM programs and partnerships with commuter assistance programs such as Bay Area Commuter Services (BACS).

Objective 3.3 **Support an integrated transportation system with efficient connections between modes.**

Policy 3.3A: Develop a multi-modal transportation system that integrates all modes into the planning, design and implementation process.

Policy 3.3B: Promote transit circulator, water taxi and bicycle and pedestrian systems serving major activity centers, such as hospitals, educational facilities, parks, malls and other major employment and commercial centers.

Policy 3.3C: Provide appropriate highway, transit, bicycle and pedestrian links to airports, seaports, rail facilities, major terminals, theme parks and other major tourist destinations.

Policy 3.3D: Support multi-modal improvements to address a system gap or deficiency at significant points such as major intersections and movable bridges that serve vehicular traffic and other modes.

Objective 3.4 To foster greater economic competitiveness, enhance the efficient movement of freight in the Tampa Bay region.

Policy 3.4A: Plan an interconnected freight movement system that encompasses air cargo, trucking, rail, pipeline and marine transportation.

Policy 3.4B: Prioritize improvements that facilitate the efficient and effective movement of freight and enhance the area's regional and global competitiveness.

Policy 3.4C: Improve intermodal connectivity and access to and from designated regional freight activity centers (such as Port of Tampa and Tampa International Airport).

Policy 3.4D: Plan implementable long-term and short-term transportation improvements on designated goods movement corridors and locally designated truck routes.

Policy 3.3E: Promote efficient roadway design standards for designated truck routes (such as turning radii, re-striping pavement and operational improvements).

Goal IV Assure that transportation improvements coordinate closely with comprehensive land use plans and support anticipated growth and development patterns.

Objective 4.1 Promote sensible growth patterns that are livable, sustainable and appealing to residents and travelers.

Policy 4.1A: Ensure that multi-modal transportation improvements support both local and statewide growth management and development goals.

Policy 4.1B: Allow lower highway LOS standards on Non-SIS roadways with acceptable transit services, particularly in urbanized areas.

Policy 4.1C: Support new development requirements to contribute ADA-compliant pedestrian, bicycle and transit amenities and facilities.

Policy 4.1D: Designate roadway and transit corridors for streetscape, gateways, noise buffering and/or median landscaping treatments.

Policy 4.1E: Encourage project designs that follow Livable Roadway Guidelines, incorporating suitable landscape and streetscape elements and addressing the needs of all users including pedestrians, bicyclists, transit users and persons with disabilities.

Policy 4.1F: Preserve and enhance scenic views of and access to waterfronts, historic and cultural assets and other attractive features.

Policy 4.1G: Encourage local governments to consider multi-modal transportation needs in their land use decisions.

Objective 4.2 Use appropriate planning and design criteria to promote community cohesion and avoid or minimize negative impacts to residential neighborhoods.

Policy 4.2A: Design an efficient multi-modal transportation system that improves connections between communities and adjacent areas, while minimizing cut-through traffic in residential neighborhoods.

Policy 4.2B: Balance the need for roadway widening and other goals and priorities of local residents.

Policy 4.2C: Design projects to soften the impact of roadway widening or extensions on established neighborhoods (such as screening, buffering and noise walls).

Policy 4.2D: Meet environmental justice requirements by preventing or avoiding disproportionate adverse impacts to low income and minority communities.

Policy 4.2E: Avoid road construction or widening projects that will isolate or disrupt established neighborhoods and business districts.

Policy 4.2F: Where appropriate, encourage measures that promote traffic calming, especially within urban service areas.

Objective 4.3 Encourage land development patterns that promote transportation efficiency.

Policy 4.3A: Support in-fill development and the creation of more livable communities by connecting neighborhoods, parks, open space, commercial and office centers with transit, bikeways and sidewalks.

Policy 4.3B: Designate corridors that allow higher density mixed use areas to be served by public transit.

Policy 4.3C: Incentivize major development projects to locate along or extend existing or planned public transit lines and implement transit-oriented development design concepts.

Policy 4.3D: Locate transit stops/stations within convenient walking distance of major concentrations of employment and housing.

Policy 4.3E: Minimize the amount of land devoted to vehicle parking and encourage policies that result in a more efficient use of parking facilities.

Goal V Enhance the safety and security of the transportation system for both motorized and non-motorized users.

Objective 5.1 Provide for safer travel for all modes of transportation, including walking, bicycling, transit, auto and freight.

Policy 5.1A: Promote safety in the planning, design, construction and maintenance of all modes in transportation projects and programs (e.g., designing for the incorporation of emerging safety-related technologies).

Policy 5.1B: Work with local governments and other agencies to identify safety concerns and conditions, and recommend projects to address key deficiencies (such as high crash locations, lighting and signage).

Policy 5.1C: Support transit, motorist, bicycle and pedestrian safety education programs.

Policy 5.1D: Encourage improved traffic operations, access management and other safety measures to reduce aggressive driving and the number of traffic crashes, including fatalities and injuries involving pedestrians and bicyclists.

Policy 5.1E: Ensure consistency with the vision, mission and goals of the Florida Strategic Highway Safety Plan.

Policy 5.1F: Encourage the reduction of emergency response time to incidents through the use of ITS.

Policy 5.1G: Assist in the designation of corridors and development of procedures to provide for safe movement of hazardous materials.

Policy 5.1H: Minimize the impacts of truck travel to roadways not designated as local truck routes or regional goods movement corridors.

Objective 5.2 Increase the security and resiliency of the multi-modal transportation system.

Policy 5.2A: Include emergency evacuation considerations in the MPO transportation planning process.

Policy 5.2B: Promote the implementation of safety and security improvements in the design or retrofit of transportation systems, including the ability to support emergency response and recovery.

Policy 5.2C: Develop the multi-modal transportation system to enhance the interface of all modes and users.

Policy 5.2D: Enhance security for all modes through the appropriate use of authorized access, surveillance systems and ITS.

Policy 5.2E: Work with federal, state and local agencies, the private sector and other stakeholders to minimize potential threats and vulnerabilities in the multi-modal transportation system.

Policy 5.2F: Enhance multi-modal transportation system capacity and build communications and information capabilities to not only respond to, but proactively deter and mitigate emergencies.

Policy 5.2G: Enhance the resiliency of the regional supply chain by identifying alternative routes that could be used to ensure goods movement during and after an incident.

Objective 5.3 Improve the ability of the transportation network to support emergency management response and recovery efforts.

Policy 5.3A: Facilitate coordination among emergency management and transportation agencies to improve regional planning for emergency management.

Policy 5.3B: Ensure understanding of roles and responsibilities for how transportation and emergency management professionals can support each other in responding to an emergency.

Policy 5.3C: Support ITS architecture expansion to enhance situational awareness necessary for emergency response and managing evacuations.

Policy 5.3D: Ensure good data sources and communication links for sharing real-time transportation network capacity so that information is available to operating agencies during and after an emergency.

Policy 5.3E: Provide socio-economic, geographic information system (GIS) and other transportation data to assist in emergency management planning.

Policy 5.3F: Use outreach and education to increase public awareness of transportation systems and their use during evacuations.

Policy 5.3G: Facilitate public and private sector service institutional arrangements and coordination, to leverage private sector resources in support of response and recovery efforts following an incident.

Goal VI Preserve existing facilities and optimize the efficiency of Transportation System Management and operations.

Objective 6.1 Acquire and preserve right-of-way at the least possible economic, ecological and social cost.

Policy 6.1A: Establish appropriate right-of-way requirements for designated corridors for public transit, HOVs, truck-only lanes, bicycles and pedestrians.

Policy 6.1B: Support the adoption of local right-of-way corridor need maps, policies and ordinances to identify, acquire and protect public right-of-way from encroachment.

Policy 6.1C: Where feasible, identify and fund the preservation of future corridors for advance right-of-way acquisition for highways, transit, freight and passenger rail, bicycle and pedestrian facilities.

Objective 6.2 Emphasize the preservation of the existing transportation system and establish priorities to ensure optimal use.

Policy 6.2A: Promote policies that maximize the use of existing transportation facilities and explore opportunities for improved connectivity before building new facilities (such as restriping for bicycle lanes, new technologies and ITS).

Policy 6.2B: Give priority and allocate funding to low-cost capital improvements designed to preserve and maintain existing thoroughfare capacity.

Policy 6.2C: Assess total multi-modal transportation investment costs by taking into account not only initial capital costs, but also operating and maintenance costs.

Policy 6.2D: Encourage implementation of roadway access management principles.

Policy 6.2E: Promote the establishment of a dedicated transit revenue base that is stable throughout economic cycles.

Policy 6.2F: Establish criteria to prioritize improvements based on the objectives set forth in this Plan.

GOALS, OBJECTIVES, AND ACTIONS

The goals, objectives, and actions provided herein are divided into three categories: **Landscapes, Livelihoods and Communities.** The growth policy is organized around these categories as a reminder of the core focus of this plan. When reading the goals and objectives it is important to keep in mind that some of the objectives can be used to help achieve more than one goal, as illustrated in Figure 2.

The goals and objectives are intended to create a basis for future actions by Missoula County. While there are numerous topics and issues that are important in Missoula County, this growth policy does not attempt to inventory and address them all. Instead, **the growth policy focuses on those goals and objectives that can lead to an action plan for Missoula County and its partners to address key land use, natural resource, and community development issues.**

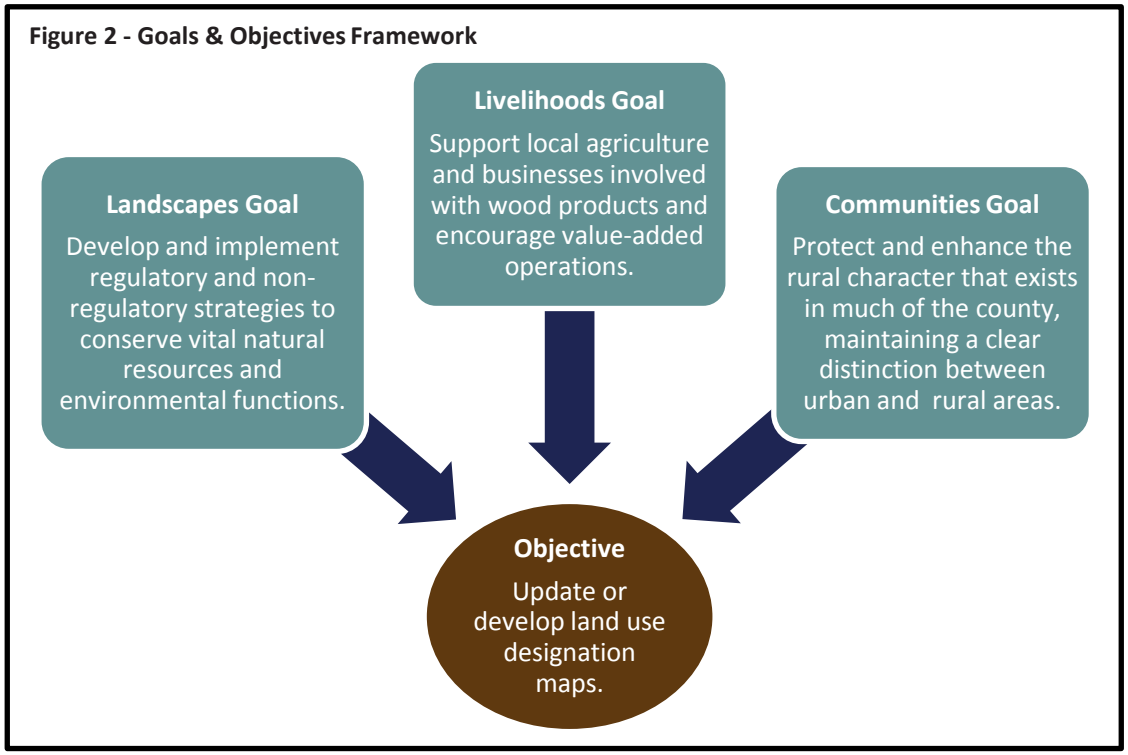
A plan is only as good as its implementation. With that in mind, this chapter describes how to help achieve the goals and objectives. Community and Planning Services (CAPS) Department or other agencies may already be addressing some goals and objectives that are established here, but because these goals and objectives continue to be a part of a future action plan they are retained in this growth policy.

The tables below list each goal and objective, anticipated actions, a timeframe, and the anticipated lead partners. As projects are implemented, the county will develop indicators of success to help measure performance.

Timeframe: This indicates when the action is expected to be taken.

- **Immediate:** These actions are to be initiated or completed within 1 to 2 years from the adoption of the plan and generally reflect high priorities
- **Mid-Term:** These actions are to be initiated or completed within 2 to 5 years from the adoption of the plan
- **Long-Term:** These actions are to be initiated or completed 5-10 years

Figure 2 - Goals & Objectives Framework



or longer after adoption of the plan

- **Ongoing:** These tasks occur continually

Lead Partners: This column lists who is planned to take a leadership role on each action. It does not cite all partners or participants who will be involved with each objective. Depending on the action, the County's role will vary from leading to facilitating to supporting.

Land Use Strategy: Following the action plan is a land use strategy that describes how the county intends to address a variety of land use-related issues through updated land use designation maps.

Landscapes

Goal #1 - Conserve vital natural resources including surface and ground water, air quality, agricultural resources, iconic landscapes, fish and wildlife species and their habitats, and native plant communities

Objectives	Actions	Timeframe	Lead Partners
1.1 Develop and implement regulatory and non-regulatory strategies to conserve vital natural resources and environmental functions.	1.1.1 Identify priority resource areas based on agricultural soils, wildlife habitat, water, scenic viewsheds, and the functions of the natural environment.	Mid-term	CAPS
	1.1.2 Update or develop land use designation maps, area and issue plans, zoning and other projects using priority resource areas. This could include the use of overlays.	Ongoing	CAPS
	1.1.3 Conserve the highest priority lands and waters while allowing other public benefits such as public access utilizing open space bond funding and other public funding sources.	Ongoing	OLC, CAPS, PTOL
	1.1.4 Cooperate with private land trusts and landowners to facilitate voluntary conservation projects with private funding.	Ongoing	OLC, CAPS, PTOL, land trusts
	1.1.5 Update subdivision regulations to provide standards that minimize and mitigate impacts to natural resources.	Immediate	CAPS

Objectives	Actions	Timeframe	Lead Partners
	1.1.6 Improve air quality through road dust abatement, wood stove change outs, energy efficiency, etc.	Ongoing	Health dept, PW, CAPS
	1.1.7 Increase the percentage of the population that is served by public or community water and wastewater systems.	Ongoing	Health dept, PW, Seeley Lake Sewer Board, Seeley Lake Water District

Goal #2 - Promote the responsible use and enjoyment of publicly-owned lands and waters

Objectives	Actions	Timeframe	Lead Partners
2.1 Maximize opportunities for access to publicly-owned lands and waters when consistent with resource management objectives.	2.1.1 Plan for and develop accesses to rivers, lakes and public lands where needed and appropriate, while concurrently protecting resources for future generations.	Ongoing	PTOL, PW, MT FWP
	2.1.2 Build trails to connect communities with public lands and to create linkages between public lands and waters, while concurrently protecting resources for future generations.	Ongoing	PTOL, PW, MT FWP, other agencies and land trusts

Goal #3 - Protect and enhance the historic and cultural structures and sites that are part of Missoula County's history and heritage

Objectives	Actions	Timeframe	Lead Parters
3.1 Protect and, where appropriate, restore and make use of key historic and cultural resources and sites.	3.1.1 Work with partners to protect, restore, and re-use historic resources, sites, and structures, where appropriate.	Ongoing	CAPS, PTOL, community councils, community groups, MT Historic Preservation Office
3.2 Respect cultural resources identified by the Confederated Salish and Kootenai Tribes and other Tribal entities.	3.2.1 Support Tribal efforts to protect and conserve cultural resources, when invited.	Ongoing	CAPS, PTOL, CSKT
	3.2.2 Include the Tribes on agency review lists for development, conservation, and parks and trails projects.	Ongoing	CAPS, PTOL
	3.2.3 Notify contractors that should Native remains or artifacts be uncovered during land development, work would need to cease and Tribal cultural resource experts need to be contacted immediately.	Immediate/ Ongoing	CAPS, PW, EHD, other develop-ment review agencies

Goal #4 - Reduce Missoula County's contribution to climate change while promoting resiliency and adapting to its impact on the natural environment and communities

Objectives	Actions	Timeframe	Lead Partners
4.1 Reduce Missoula County's contribution to climate change.	4.1.1 Use green building principles and consider energy efficiency and waste reduction when siting, upgrading, and constructing public facilities.	Ongoing	BCC, Facilities Manage-ment, PW
	4.1.2 Adopt a green-building incentive program for qualifying private sector development projects focusing on siting, energy efficiency, waste reduction and other measures.	Mid-term	CAPS, PW
	4.1.3 Encourage alternative energy development and use in county facilities and land use plans and policies.	Ongoing	CAPS
	4.1.4 Work with Mountain Line, MRTMA and/or other transportation providers to expand service to rural areas and/or promote ridesharing.	Long-term	CAPS, Mountain Line, MRTMA
	4.1.5 Ensure land use plans and regulations accommodate home-based businesses where appropriate to reduce vehicle miles traveled	Ongoing	CAPS
	4.1.6 Develop county policy to reduce energy use and waste generation at the county level and encourage recycling efforts. Find and use renewable energy sources where possible.	Mid-term	BCC, Facilities Management
4.2 Develop and implement strategies to adapt to climate change.	4.2.1 Convene a working group to investigate the current level of greenhouse gas emissions generated from county facilities and develop a climate change monitoring, mitigation and adaptation plan for Missoula County or participate in other local working groups.	Immediate	BCC, CAPS

Objectives	Actions	Timeframe	Lead Partners
4.3 Encourage legislative action on alternative energy.	4.3.1 Support the continuation of tax breaks for alternative energy.	Immediate	BCC
	4.3.2 Lobby for tax breaks for community solar.	Immediate	BCC

Note: Objectives and actions related to climate change prevention and adaptation located elsewhere in this chapter include: providing efficient and functional communities that encourage compact development patterns; encouraging multi-modal transportation, supporting local agricultural markets and local businesses to minimize vehicle miles traveled; protecting life and property from floods and wildfires, and water quality protection measures.

Livelihoods

Goal #5 - Promote economic development that creates opportunities throughout Missoula County including people living and working in rural communities and across wage levels

Objectives	Actions	Timeframe	Lead Partners
5.1 Support local businesses.	5.1.1 Develop a buy-local program for county government and invite other governments, non-profits and businesses to participate.	Mid-term	BCC
	5.1.2 Provide grant writing and other technical support to qualifying companies seeking to add value to local products and create jobs in rural areas.	Ongoing	BREDD, MEP, GCP
	5.1.3 Support business location, retention and expansion efforts as opportunities arise.	Ongoing	BREDD, BCC, MEP
	5.1.4 Work with business community to improve permitting systems and streamline development review.	Ongoing	
5.2 Expand economic opportunities in rural areas of the county.	5.2.1 Work with local economic development agencies to create a targeted plan(s) for rural communities.	Mid-term	MEP, BREDD, BCC, and private partners

Objectives	Actions	Timeframe	Lead Partners
5.3 Facilitate well-designed commercial and industrial development that is located appropriately, served by necessary infrastructure, conducive to public health and the environment, and reduces buyer and developer financial and legal risks.	5.3.1 Create an industrial site readiness and certification program based on the results of the Industrial Lands Study.	Mid-term	BCC, MDA
	5.3.2 Modernize the county zoning resolution to reflect current and anticipated industries and businesses and to encourage clean technology firms.	Mid-term	CAPS
	5.3.3 Support efforts of business groups in Missoula County communities to improve the appearance and function of the business districts.	Ongoing	CAPS, BCC, MDT, PW, GCP
5.4 Facilitate the re-use of former industrial sites and previously developed, under-utilized parcels of land to revitalize blighted and infrastructure deficient areas and spur private investment.	5.4.1 Use brownfield programs, tax increment finance, targeted economic development districts and other tools to assist with redevelopment efforts.	Ongoing	GCP, MDA, BCC

Objectives	Actions	Timeframe	Lead Partners
5.5 Support workforce training.	5.5.1 Develop a county internship program to provide training to local students.	Immediate	BCC, county depts, UM, Missoula College
	5.5.2 Partner with educational institutions and economic development agencies to create opportunities to retain college and university graduates by matching skills with local industries, especially emerging industries.	Ongoing	UM, Missoula College, BREDD, MEP

Goal #6 - Embrace emerging economic trends and new technologies that will prepare Missoula County for the economy that will exist in 20 years

Objectives	Actions	Timeframe	Lead Partners
6.1 Support initiatives to expand digital communications and develop clean technologies throughout the county.	6.1.1 Research, assess, and enhance broadband availability and affordability throughout Missoula County.	Ongoing	BCC, BREDD, MEP
	6.1.2 Support legislation to expand digital communications in rural areas.	Ongoing	BCC, BREDD, MC Operations, MEP
	6.1.3 Adopt a county policy to require broadband conduit be included in projects in county right-of-way and private road easements in subdivisions for future expansion where appropriate.	Immediate	BCC, CAPS

Goal #7 - Sustain and promote the land- and resource-based industries of agriculture, timber, restoration, and recreation that are part of the local economy and heritage

Objectives	Actions	Timeframe	Lead Partners
7.1 Conserve agricultural lands and timberlands. (See also Landscapes.)	7.1.1 Identify actual amount of remaining agricultural land and evaluate its value/usability for agriculture using parcel size and other factors.	Midterm	CAPS, Extension Office
	7.1.2 Support projects using public and private funding sources to conserve agricultural lands.	Ongoing	CAPS, OLC
	7.1.3 Revise subdivision regulations to address impacts to agriculture and to conserve important agricultural soils.	Immediate	CAPS
7.2 Support local agriculture and businesses involved with wood products and encourage value-added operations.	7.2.1 Create land use designation mapping and zoning that include opportunities for growing and processing of natural resource products in appropriate locations, as well as the flexibility for affiliated businesses.	Mid-term	CAPS
	7.2.2 Assist with efforts to create and expand markets for locally grown and made products.	Ongoing	BREDD, MEP
	7.2.3 Research and develop policies, legal tools and funding sources for new farm start-ups and farmland conservation.	Immediate	CAPS, FVLT, Extension Office, CFAC, MOR, PTOL, City of Missoula, and other partners

Objectives	Actions	Timeframe	Lead Partners
7.3 Support efforts of public and private sectors to restore and maintain healthy forests, including harvesting timber, while meeting other resource management goals.	7.3.1 Engage in the Southwest Crown of the Continent Collaborative and other initiatives as opportunities arise.	Ongoing	BCC, CAPS, USFS
	7.3.2 Encourage forest restoration projects that result in economic activity, fuels reduction and improvements to wildlife habitat.	Immediate	OEM, USFS, PTOL
	7.3.3 Support legislation that enables collaborative efforts to restore and maintain healthy forests and reduce wildfire risks.	Ongoing	BCC
7.4 Help to develop the recreation and tourist economies.	7.4.1 Complete recreation mapping efforts and support marketing and educational opportunities.	Mid-term	PTOL, other partners
	7.4.2 Work with partners to develop and market a regional parks and trail system.	Ongoing	PTOL, City Parks and Recreation, BREDD, MEP, CAPS, local communities

Communities

Goal #8 - Proactively plan and provide for the logical growth of communities while protecting rural character and sustaining county resources by guiding development to areas most suited for it

Objectives	Actions	Timeframe	Lead Partners
8.1 Protect and enhance the rural character that exists in much of the County, maintaining a clear distinction between urban and rural areas.	8.1.1 Review and update land use designation maps where there is community interest to accommodate growth, while protecting vital natural resources.	Immediate, Mid-term	CAPS
	8.1.2 Review and update or retire area and issue plans.	Immediate, Mid-term	CAPS
8.2 Provide opportunities for varied land uses in and around existing communities.	8.2.1 Update area plans and zoning regulations to accommodate modern development types for urban and rural areas.	Mid-term, Ongoing	CAPS
	8.2.2 Work with land owners and residents to develop area plans and apply zoning standards to guide community growth.	Mid-term	CAPS

Objectives	Actions	Timeframe	Lead Partners
8.3 Guide new subdivisions and development to areas that have the least impact on natural resources and are most suited for development.	8.3.1 As part of land use and other plans, identify and communicate where development is encouraged and discouraged.	Ongoing, mid-term	CAPS
	8.3.2 Explore opportunities for zoning with density standards.	Mid-term	CAPS

Goal #9 -As part of planning, support the provision of infrastructure and services to and within rural communities

Objectives	Actions	Timeframe	Lead Partners
9.1 Support increased infrastructure capacity, services and amenities in and around existing communities where appropriate.	9.1.1 Continue to identify and set priorities for community development projects, while minimizing impacts to service providers.	Ongoing	PW, MDT
	9.1.2 Provide grant writing administration, and technical support for projects.	Ongoing	PW, GCP
	9.1.3 Support legislative efforts to provide infrastructure funding for community development.	Ongoing	BCC
	9.1.4 Create and support policies that require developers and new users to pay their proportional share of the costs necessary to serve new development.	Mid-term	CAPS, PW

Goal #10 - Provide opportunities for a wide range of housing choices, especially for those who are homeless or experiencing high costs for housing relative to income

Objectives	Actions	Timeframe	Lead Partners
10.1 Facilitate the development of a variety of housing types including housing that is affordable to all segments of the population.	10.1.1 Project the amount of housing that will be needed of all types and price levels to accommodate the projected population growth.	Mid-term	GCP, CAPS, PW Building Division, MOR, other partners
	10.1.2 Identify areas for housing development through land use designation mapping and area planning to accommodate the projected housing needs.	Mid-term	GCP, CAPS, PW Building Division, MOR
	10.1.3 Work with local communities to revise or initiate new zoning to accommodate the projected housing needs.	Mid-term	MHA, GCP, CAPS
	10.1.4 Research and create an incentive program for private development of housing for underserved groups.	Mid-term	MHA, GCP, CAPS, BCC, private developers
	10.1.5 Seek and utilize creative financing tools and public funding to provide housing for underserved groups.	Ongoing	MHA, GCP, CAPS, other housing developers

Note: Objectives and actions related to affordable housing are located elsewhere in this chapter, particularly under Goals 8 and 9.

Goal #11 - Reduce the safety risks and costs associated with wildland fire, flooding, and other hazards

Objectives	Actions	Timeframe	Lead Partners
11.1 Discourage development in hazardous areas and areas where public and emergency responder safety is compromised.	11.1.1 Identify hazardous areas, including mapping of wildfire and floodplain risks.	Immediate, Ongoing	OEM, CAPS, DNRC, USFS, fire districts, fire service fee areas
	11.1.2 Provide mapping and other information to the public about local hazards in an easily accessible format.	Immediate	CAPS, OEM, other partners
	11.1.3 Explore zoning regulations to guide growth to appropriate locations (outside of hazard areas).	Mid-term	CAPS, OEM
	11.1.4 Complete channel migration zone mapping to identify historical river and stream movement and model future movement.	Mid-term	OEM, Health dept, CAPS

Objectives	Actions	Timeframe	Lead Partners
11.2 When development in hazardous areas does occur, take appropriate measures to limit safety risks and ensure emergency personnel have sufficient resources to respond safely and effectively.	11.2.1 Work with public safety and resource agencies to identify and mitigate risks and provide appropriate resources for public and responder safety.	Ongoing	OEM, CAPS, GCP, fire districts, fire service areas
	11.2.2 Adopt development regulations that require the best possible hazardous mitigation techniques, including Firewise construction, multiple accesses, etc.	Ongoing	OEM, CAPS, PW, DNRC, fire districts, fire service areas
	11.2.3 Provide information to landowners regarding development in hazardous areas (evacuation plans, Firewise development practices, etc.). Explore the possibility of providing risk disclosure statements.	Ongoing	OEM, CAPS, fire districts
	11.2.4 Support efforts such as cost sharing to help landowners reduce fuels and take measures to make their properties more resilient to hazards.	Ongoing	OEM, GCP

Goal #12 - Promote healthy active communities

Objectives	Actions	Timeframe	Lead Partners
12.1 Expand and maintain the network of trails, pathways and sidewalks.	12.1.1 Support development, maintenance, and expansion of trails, including those in the County Parks and Trails Master Plan and the Active Transportation Plan.	Ongoing	PTOL, City, MPO
	12.1.2 Pursue funding for trail development and maintenance, including legislation.	Ongoing	PTOL, City, MPO, MDT, private organizations
12.2 Enhance parks and recreational opportunities throughout Missoula County.	12.2.1 Implement the Parks and Trails Master Plan	Ongoing	PTOL, City Parks and Recreation
12.3 Encourage development of community facilities that promote health and wellness for all age groups.	12.3.1 Coordinate with the health community to provide and enhance community facilities for health and wellness.	Ongoing	Health dept, PTOL

Goal #13 - Promote equal access to employment, safe housing, transportation, community services and amenities for all segments of the population

Objectives	Actions	Timeframe	Lead Partners
13.1 Maximize access for all segments of the population to economic opportunities, social services, health care and other services.	13.1.1 Assess where services are not reaching those in need or are not effective and identify needed actions to ensure access.	Ongoing	GCP, PHC, federal, state and tribal agencies, non-profit organizations

Goal #14 - Improve communication between Missoula County officials and residents and enhance opportunities for public engagement in local government

Objectives	Actions	Timeframe	Lead Partners
14.1 Increase contact and communication between Missoula County government and residents.	14.1.1 Ensure staff or county officials attend community meetings when appropriate.	Ongoing	BCC, Communications dept, county depts
	14.1.2 Implement other communication mechanisms to maximize public outreach and transparency.	Ongoing	BCC, Communications dept, county depts
	14.1.3 Utilize community councils and other advisory boards to help improve communication in both directions and provide opportunities for public engagement.	Ongoing	BCC, county depts
	14.1.4 Provide staff support to community efforts when fiscally possible.	Ongoing	BCC, CAPS, PW, Health dept, Weed District
	14.1.5 Implement policies regarding public meeting notice and update as needed.	Ongoing	BCC, Communications dept
	14.1.6 Prepare and disseminate information on the relationship between taxes paid and cost of providing services.	Ongoing	Finance and Communications depts

Objectives	Actions	Timeframe	Lead Partners
14.2 Enhance opportunities for public engagement.	14.2.1 Support and encourage opportunities for rural representation on County boards.	Ongoing	BCC
	14.2.2 Evaluate whether the joint City-County Planning Board provides sufficient representation to rural areas.	Immediate	BCC, CAPS
	14.2.3 Structure community development projects to incorporate a variety of opportunities for public involvement.	Ongoing	CAPS, Communications dept, county depts, BCC
	14.2.4 Increase PB members involvement in rural projects and provide opportunities for PB to learn about rural planning and community issues.	Immediate	BCC, CAPS, county depts., PB

Goal #15 - Provide effective customer service and flexible, predictable and timely development review processes

Objectives	Actions	Timeframe	Lead Partners
15.1 Provide simple, clear and flexible land use and development regulations, procedures and forms.	15.1.1 Use plain language, graphics and build in flexibility as regulations are revised.	Ongoing	CAPS, PW, Health dept., county depts
	15.1.2 Provide resourceful and responsive assistance in a fair and objective manner to Missoula County residents, businesses, property owners, and visitors.	Ongoing	CAPS, PW, Health dept., county depts
	15.1.3 Set up a regular meeting of agency personnel to review development applications. Explore options to incentivize early comment from agencies and resolution of conflicting comments.	Immediate	CAPS, PW, EHD, other development review agencies
	15.1.4 Establish targets to process development applications more quickly than required under state law.	Immediate	CAPS, PW, EHD, other development review agencies
15.2 Provide enforcement of development regulations that is reasonable and adequate.	15.2.1 Development rules will be enforced using common sense.	Ongoing	CAPS, Health dept, PW, County Attorney

Goal #16 - Promote cooperation between Missoula County and the city, state, federal and tribal governments

Objectives	Actions	Timeframe	Lead Partners
16.1 Maintain compatible policies, coordinated services and regular communication with the City of Missoula.	16.1.1 Maintain and update as needed the City-County inter-local agreement that guides coordinated planning efforts.	Ongoing	BCC, CAPS, Development Services, Mayor
	16.1.2 Maintain an agreement for review of plans and projects in the Missoula urban fringe.	Ongoing	CAPS, Development Services, Mayor
16.2 Maintain open, regular communication and coordinated efforts for better service delivery to the public.	16.2.1 Continue to conduct regular meetings with agencies and organizations to exchange information and address common issues.	Ongoing	BCC, CAPS, other governments, private sector organizations
16.3 Maintain the Memorandum of Understanding with land management agencies in Missoula County.	16.3.1 Continue biannual meetings with land management agencies, and interagency review of development projects.	Ongoing	BCC, CAPS, DNRC, USFS, BLM, MDT, FWP
16.4 Maintain the land use Memorandum of Agreement with the Confederated Salish and Kootenai Tribes.	16.4.1 Follow the provisions of the MOA with CSKT regarding review of development projects.	Ongoing	BCC, CAPS, CSKT
	16.4.2 Continue annual or as needed meetings between the BCC and the Tribal Council of the CSKT.	Ongoing	BCC, CAPS, CSKT

NATURAL ENVIRONMENT

TOPICS

- Purpose
- Referenced Plans
- Background
- Critical Areas
- Shorelines
- Water Resources
- Air Quality
- Noxious Weeds
- Green Building
- Wildfires
- Goals and Policies

PURPOSE

Given the extraordinary natural setting of Wenatchee and the growing recognition of the environment's relationship with economic and social well-being, the topics of this Natural Environment chapter could not be left out. This section, along with others in this Plan, speaks to one of the vision statements identified by locals in 2002: "*The city will protect and enhance its natural setting and environmental quality, including the surrounding hillsides, shorelines, and scenic vistas*."

In addition to addressing typical components of the natural environment (such as water, air and natural habitat), this chapter includes the Growth Management Act (GMA) mandatory critical areas and shoreline components conventionally found in the Land Use Element.

REFERENCED PLANS

Multiple documents contain information not specifically included in this plan but are necessary for providing an overview of the City of Wenatchee's natural environment. Plans, documents or studies which have been adopted as a component of this plan or serve as adopted guidance materials are listed in their entirety under the section, Relationship to Other Plans & Studies, in the Wenatchee Urban Area Plan.

BACKGROUND

Wenatchee is located in north central Washington-the heart of the Northwest. It is placed in a river valley along the Rock Island Reservoir, at the confluence of the Wenatchee and Columbia Rivers. The city is bound to the east by the Columbia River, to the north by the Wenatchee River, and to the west and south by the North Cascades foothills. Most of the urban growth area (UGA) is built on alluvial fans and flood deposits left by a series of major flood events from the Columbia River, Number One and Two Canyons, Dry Gulch, Wenatchee River, and Squilchuck Creek.

These natural features require an ongoing commitment from the City to protect the

functions and values of critical areas while minimizing and avoiding hazards for the community from flooding, seismic, stormwater impacts or geologically hazardous areas.

Wildfires are also part of the ecology of the local natural environment for the Wenatchee Valley. Since 1992, the City of Wenatchee has been affected by 4 wildfire events. While these events are a natural component of our ecosystem, they have a significant effect on residents and the built environment.

CRITICAL AREAS

Critical areas include wetlands, areas with a critical recharging effect on aquifers used for potable water, fish and wildlife habitat conservation areas, frequently flooded areas, and geologically hazardous areas. The City of Wenatchee has adopted development regulations which both designate and protect these critical areas for the functions they provide and to avoid and minimize impacts to the community from potential hazards.

A further description of these critical areas includes:

- Wetlands- land areas inundated or saturated with surface water or ground water at a frequency and duration to support vegetation adapted to life in saturated soil.
- Areas with a critical effect on aquifers used for potable water- areas with a critical recharging effect on aquifers used for potable water, including areas where an aquifer that is a source of drinking water is vulnerable to contamination that would affect the potability of the water, or is susceptible to reduced recharge.
- Fish and wildlife habitat conservation areas- areas that serve a critical role in sustaining needed habitats and species for the functional integrity of the ecosystem, and which, if altered, may reduce the likelihood that the species will persist over the long term.
- Geologically hazardous areas- include those areas that are susceptible to erosion, sliding, earthquakes, or other geological events. These areas can pose a threat to the health and safety of citizens, and possibly to adjacent lands.
- Frequently flooded areas- are lands in the flood plain subject to at least a one percent or greater chance of flooding in any given year, or within areas subject to flooding due to high groundwater.

The City of Wenatchee was the first jurisdiction in the region to adopt critical area regulations and designations in response to the requirements of the Growth Management Act. Since the inception of the Growth Management Act in the 1990's the body of science, tools and approaches for critical areas continues to change. As a whole, recognizing that science is an evolving field, the Growth Management Act was amended to state under RCW 36.70A.172(1)." In designating and protecting critical areas under this chapter, counties and cities shall include the best available science in developing polices and development regulations to protect the functions and values of critical areas. In addition, counties and cities shall give special consideration to conservation as protection measures necessary to preserve or enhance anadromous fisheries."

The City of Wenatchee has adopted and incorporated this standard in the designation and ongoing protection of critical areas and conducts a periodic review, at 8 year intervals, as required

under RCW 36.70A.130 to ensure that best available science is incorporated in city policies, designations and requirements.

The adoption of critical area codes for jurisdictions in Washington State was a significant step in protecting the function and values of critical areas and minimizing and avoiding the impacts of hazards to the public. The effectiveness of critical area protection solely via a regulatory approach alone is limited. A more successful model includes public and private partnerships and investments with an emphasis on educational opportunities for the public.

This approach has been successful for the Wenatchee Valley. Since the 2006 City of Wenatchee Urban Area Plan update significant land purchases, trailhead and trail construction, educational events, critical area enhancements, and approaches or measures to address local natural hazards have occurred in the Valley. These efforts have been possible through significant public private partnership and citizen involvement. Regional partners include but are not limited to the City of Wenatchee, Chelan County, federal and state agencies, the Chelan County Public Utility District, the Trust for Public Lands, the Chelan-Douglas Land Trust, and Cascadia Conservation District, among others.

The most recent coordinated effort is the development of the City of Wenatchee Habitat Plan prepared by the City of Wenatchee Parks, Recreation and Cultural Services Department. This updated plan provides guidance in determining acquisition and habitat enhancement priorities. Through the process of working with private landowners, community groups and public agencies, the Department has protected in perpetuity, over 800 acres of land for outdoor recreation, habitat conservation and open space. The Parks Recreation and Cultural Services Department continues to work with community partners to protect hundreds of additional acres.

SHORELINES

Washington State's citizens voted to approve the Shoreline Management Act of 1971 in November 1972. The adoption of the Shoreline Management Act (Act) recognized "that the shorelines of the state are among the most valuable and fragile of its natural resources and that there is great concern throughout the state relating to their utilization, protection, restoration, and preservation" and that a, "coordinated planning is necessary in order to protect the public interest associated with rights consistent with the public interest" (RCW 90.58.020). The Act seeks to provide environmental protection for shorelines, preserve and enhance shoreline public access, and encourage appropriate development that supports water-oriented uses.

Under the Act, shoreline master programs are created and implemented based on a "cooperative program of shoreline management between local government and the state". The nature of a master program is that it is both a policy and a regulatory document. The City of Wenatchee adopted the first City of Wenatchee Shoreline Master Program effective on October 31, 2014, replacing and superseding the previous Chelan County Shoreline Master Program that was applicable in the City.

As provided d in RCW 36.70A.480, the goals and policies of the City of Wenatchee Shoreline Master Program are an element of the City of Wenatchee Urban Area Plan. The development of the city's shoreline master program was done to provide a consistent document that worked in concert with the city's comprehensive plan. With respect to critical areas within the shoreline jurisdiction, adopted standards and policies for the master program provide an equal or greater level

of protection to the city's critical area code, adopted under the Growth Management Act. This is particularly important given the city's mandate to give special consideration to conservation and protection measures necessary to preserve or enhance anadromous fisheries, which primarily occur associated with the shoreline of the Wenatchee and Columbia Rivers and their associated wetlands.

Similar to the City of Wenatchee's Urban Area Plan, the City of Wenatchee Shoreline Master Program will also be updated on an eight year update cycle.

WATER RESOURCES

Water resources include the Eastbank Aquifer (the source of Wenatchee's public water supply), emergency back-up wells, irrigation districts serving parts of the City and urban growth area, storm-water, and local surface water bodies including the Columbia River and the Wenatchee River.

Stormwater

According to the Department of Ecology, stormwater is the leading contributor to water pollution in urban areas. Stormwater is defined as runoff during and following precipitation and snowmelt events, including surface runoff, drainage or interflow. Rain and snowmelt run onto impervious surfaces (roads, sidewalks, parking lots) where it picks up pollutants left by human activities including cars, fertilizers, and pets. The stormwater enters the municipal stormwater system through catch basins and inlets and in most places discharges directly to local rivers and creeks without treatment. Common pollutants in stormwater include lead, zinc, copper, chromium, arsenic, cadmium, oil and grease, nutrients, fecal coliforms, and sediment. Potential sources consist of leaky vehicles, various vehicle parts and emissions, pet waste, sanitary sewer overflows or illicit connections, pesticides, paints, construction sites, vehicle washing, fertilizers, and vegetative matter.

Under the federal Clean Water Act, the Environmental Protection Agency (EPA) published the Phase II storm water regulations in 1999, extending requirements for a National Pollutant Discharge Elimination System (NPDES) municipal stormwater permit to all municipalities located in urbanized areas. The NPDES permit requires the implementation of a stormwater management program that plans to reduce the discharge of pollutants, reduce impacts to receiving waters, eliminate illicit discharges, and makes progress towards compliance with surface water, ground water, and sediment standards.[23]

Since the first NPDES Eastern Washington Phase II Municipal Stormwater Permit was issued in 2007 by the Washington State Department of Ecology, the City has developed and implemented the Wenatchee Valley Stormwater Management Program. The program was developed in coordination with four other permitted agencies including Douglas County, Chelan County, and City of East Wenatchee. The six required elements of the program are reviewed and updated annually: Public Education and Outreach, Public Involvement and Participation, Illicit Discharge Detection and Elimination, Construction Site Stormwater Runoff Control, Post-Construction Stormwater Management for New Development and redevelopment, and Municipal operations and maintenance. In addition, the program addresses the preparation of an annual stormwater program plan, documentation of coordination mechanisms for implementing the

program, and recordkeeping and monitoring requirements.

Most of the urban area is connected to the stormwater collection system and discharges directly into local waters. To reduce the impact of stormwater discharges from new development and re-development, the City has implemented and encouraged the use of low impact development. Low impact development is a stormwater and land use management strategy that strives to preserve the natural landscape, emphasize conservation, and infiltrates stormwater on-site. Common methods include designing streets that channel water run-off onto landscaped areas, using pervious pavement materials, and incorporating water run-off on site through landscaping and design.

Low Impact Streets

Portland, OR

Another option for managing stormwater involves adding water quality treatment at outfalls to surface water and throughout the system. Water quality treatment facilities can be above ground in the form of swales and ponds or below ground, such as hydrodynamic separators and filters.

Options to consider for stormwater include:

Water Supply

Located just north of Rocky Reach Dam, the Eastbank Aquifer is the primary source of drinking water for the City of Wenatchee, East Wenatchee Water District and Public Utility District No. 1 of Chelan County. Aquifers, such as the Eastbank Aquifer, act as a natural filter and underground storage for water. The Eastbank Aquifer is recharged by the Columbia River, and has produced consistently high quality water since 1983. The aquifer provides an average of 10.5 million gallons per day to Wenatchee Valley residents. To protect this valuable natural resource, the City implements programs for water quality monitoring, cross connection control, wellhead protection, and water use efficiency.

In 2003 the Municipal Water Law (Engrossed Second Substitute House Bill 1338) established a requirement for all municipal water suppliers to use water efficiently to insure water for future demand. The City's Water Use Efficiency program includes metering production and consumption, public education and outreach, capital improvements to address leaks, and annual reporting on water system leakage. The City's water use efficiency also promotes low water-use landscaping or xeriscaping. Xeriscape techniques help conserve water by using plants that are native, drought-resistant, and/or need little extra water.

To meet the needs of existing customers and future growth in the Wenatchee Valley

for the next fifty years, the City and the regional partners have been developing a second water source south of Wenatchee. Construction of the second water source is expected to begin in 2018 and pipeline construction is planned for 2019. The new water source will provide redundancy and improved reliability of service.

Another method for conserving water is by using reclaimed water for irrigation. Presently, a number of properties get irrigation water from the Wenatchee Reclamation District. This water is drawn from the Wenatchee River and distributed by the highline canal. Also, many other properties use domestic drinking water for irrigation purposes. The less domestic water used for irrigation, the less often the City needs to apply for more water rights.

Options to consider for Water Supply include:

1. Landscaping. Update the Landscape and Screening Ordinance to promote landscaping that conserves water.
2. Reclaimed Water. Use reclaimed water for irrigation. More analysis would be necessary to see if it's feasible for Wenatchee.
3. Education. Promote water use efficiency in buildings, appliances, landscaping, and daily life through public outreach and informational materials.

AIR QUALITY

Washington State has been steadily improving its air quality; as of 2004 all but one area met the federal clean air standards. The State's major air pollution sources, according to the Department of Ecology, include motor vehicles, other non-road vehicles and equipment (lawnmowers, boats, trains and recreational vehicles), industrial emissions, wood stoves and fireplaces, and outdoor burning. Motor vehicles (59%) and other non-road vehicles (20%) combined produce nearly 80% of air pollution.

In addition to vehicles, outdoor burning can be a significant contributor to air degradation. Within Wenatchee city limits, no outdoor burning of any kind is allowed. However, in the UGA outside of the city limits, agricultural burning is allowed for business purposes only.

The Department of Ecology measures one air pollutant in Wenatchee: particulate matter 2.5 (PM 2.5). PM 2.5 refers to particles (less than 2.5 microns in size) of soot, dust, and unburned fuel in the air, mainly caused from combustion (diesel emissions, woodstoves, industry, and outdoor burning). The EPA set PM 2.5 standards not to exceed 65 micrograms per cubic meter of air, averaged over 24 hours, and 15 micrograms per cubic meter of air, averaged over a calendar year.

While Wenatchee records show adherence to measured air quality standards, air inversions, common during the winter, can decrease local air quality significantly.

Options to consider for Air Quality include:

1. Automobiles. Promote the use of alternative modes of transportation (walking, bicycling, mass transit) to diminish dependency on single-occupied vehicles, the leading contributor to air pollution.
2. Education. The community's contribution to air degradation could be reduced by educating the public on principal sources of air pollution and how personal choices affect air quality.
3. City Leadership. Purchase low-emission and/or cleaner burning vehicles by City departments to lessen the City's contribution to air pollution and promote business action to improve air quality.

NOXIOUS WEEDS

Noxious weeds are nonnative plants that have been introduced to a particular area or ecosystem. Because of their aggressive growth and lack of natural enemies, these species are highly destructive, competitive, and difficult to control.

In RCW 17.10, Washington State mandates the control of many weed species, holding landowners responsible for controlling weeds on their property. If landowners fail to comply, the county's noxious weed control board may control weeds at the owner's expense.

The most troublesome noxious weeds within Wenatchee include puncturevine (goathead), knapweed, and kochia. In outlying county areas, toadflax is also a problem. Puncturevine, known to many as "goat heads," is an increasing problem in city alleys and fields. The seeds are very persistent, remaining viable for years, and the

Puncturevine Burs

small, sharply pointed burs commonly get stuck in tires, pets, shoes, and bare feet.

Options to consider for Noxious Weeds include:

1. In-Field Program: Create a noxious weed program that actively pursues controlling noxious weeds on public property and rights-of-way (especially alleys) and informing affected private landowners.
2. Public Outreach: Work with Chelan County Noxious Weed Control Board to increase public awareness and promote volunteer clean-up action.

GREEN BUILDING

Green building refers to an approach applied to the design, construction, and operation of buildings that helps mitigate adverse environmental, economic, and social impacts of buildings. For instance, in 1996, building construction and demolition contributed nearly 60 percent of all U.S. non-industrial waste. In 2002, buildings accounted for 38 percent of total carbon dioxide emissions, almost 68 percent of electricity consumption, and nearly 40 percent of total energy consumption for the nation.[24] We spend an average of 90 percent of our time in buildings yet the air quality inside is two to five times worse than outside air (U.S. EPA). Green building practices recognize the relationship between natural and built environments and seek to minimize the use of energy, water and other natural resources; minimize waste generation; and provide a healthy, productive indoor environment.

General strategies for green building include: developing a site to preserve natural water flow, reducing construction waste, designing buildings that support good indoor air quality and the efficient use of natural resources, and using materials that are less detrimental to the environment. Benefits of green building include: reduction of waste, decreased water use, energy conservation, reduced operating and maintenance costs, improved indoor air quality, as well as improvements in employee morale,

[24] U.S. EPA. 2004. *Buildings and the Environment: A Statistical Summary*. http://www.epa.gov/greenbuilding/pubs/gbstats.pdf

health, productivity, recruitment, retention, and public image.

Many home builder associations throughout Washington have developed green building programs for their areas. Most have a checklist that offers different green building strategies with point values assigned to each, allowing developers different ways to incorporate green techniques. A point system allows the creation of a regional certification program by rating different green buildings (e.g. one to five stars) according to how many points are achieved.[25]

WILDFIRE-

There have been four significant fire events within the City of Wenatchee in recent history, with two of these events resulting in structure loss. The 1992 Castle Rock Fire resulted in the loss of 17 homes and 15 apartment units, while the 2015 Sleepy Hollow Fire extended well into the urban core of Wenatchee, destroying 29 homes and four industrial buildings in North Wenatchee near the waterfront.

As a community the City of Wenatchee has been proactive in its approach to wildfires, in 2011 adopting a Wildland-Urban Interface Chapter. The Objective of the Chapter is: "…to establish preferred construction materials, methods and planning that reduce the hazards to life and property associated with the building's ability to withstand exposure to wildfire events." Additionally, the City has been pro-active in emphasizing the need for effective circulation systems which provide for Secondary Access in future transportation corridors and development. Water utilities have been coordinated between the Chelan County PUD and the City of Wenatchee to ensure sufficient water supplies during wildfire events. These actions and the redevelopment of impacted areas help demonstrate the community's resilience to natural hazards.

Still, more work is necessary to become a Fire Adapted Community. Being a Fire Adapted Community is part of the National Cohesive Strategy which recognizes that need to manage landscapes which represents the fuel source, improve fire response or fire suppression capacity, and develop Fire Adaptive Communities. A Fire Adapted Community is one that is works to prevent fire, prepares for the event of fire, and is suited to recover from fire when it happens. The City of Wenatchee and Chelan County Fire District No. 1 are committed to growing community resilience as wildfire will always be a threat to cities throughout North America.

"Community resilience is the capability to anticipate risk, limit impact, and bounce back rapidly through survival and adaptability, evolution, and growth in the face of turbulent change." CARRI Report, Community Resilience, An Analysis

While the steps that Wenatchee had taken to improve and adapt to wildfire hazards were positive, the City seeks to learn from the most recent wildfire event that devastated the community.

In 2015 the City of Wenatchee applied to the Community Planning Assistance for Wildfire Program, CPAW, to be one of five communities to be evaluated with professional consulting services including land use planners, foresters, wildfire risk modelers and hazard mitigation specialists to integrate wildfire mitigation measures into the development planning process. CPAW is a partnership between Headwaters Economics and Wildfire Planning International. The program is funded through a cooperative agreement

[25] BUILT GREEN Washington. 2006. http://www.builtgreenwashington.org/

with the USDA Forest Service and private foundations.

A multi-disciplinary team worked with local stakeholders in a nine month process looking at Wenatchee's unique wildfire needs. Recommendations have been provided to the City in August 2016. Chelan County has also applied for this program and will be a participant for 2017.

The City of Wenatchee will be developing a Wildfire Protection Plan for the City in partnership with Chelan County Fire District No. 1, engaging stakeholders and the public. The City anticipates coordinating with Cascadia Conservation District and Chelan County in the development of Wildfire Protection Plans which have overlapping interests for wildfire protection.

As Wildfire Plans are developed and implementation measures such as code and policy changes, and private and public measures are pursued, it is clear that a community response will be the most effective in increasing Wenatchee Valleys' adaptive capabilities to wildfire risk and events.

GOALS AND POLICIES

GOAL 1: EDUCATION - *Foster a community that values, understands, and protects our environment, thereby sustaining a healthy and desirable place to live.*

Policy 1: Be an active player in education and involvement programs that raise public awareness about environmental issues, advocate respect for the environment, and demonstrate how individual and cumulative actions directly affect our surroundings.

Policy 2: Work in cooperation with public agencies, local organizations, associations, departments, and groups in creating and carrying out environmentally-related programs and outreach efforts.

Policy 3: Actively pursue grants that will aid in creating a more sustainable and healthy community.

Policy 4: Be a business leader in fostering environmental awareness in City departments by purchasing environmentally sensitive products, and promoting energy and water conservation, proper waste management and more environmentally responsible modes of transportation.

GOAL 2: CRITICAL AREAS – Maintain critical area functions and values within the City while seeking to protect the public and personal property from the effects of natural hazards.

Policy 1: Regulate or mitigate activities in or adjacent to critical areas to avoid adverse environmental impacts.

Policy 2: Review, amend and where appropriate expand critical area designations and associated development regulations to provide for accuracy, effectiveness, and utilization of best available science.

Policy 3: Preserve and protect anadromous fish, and threatened, endangered and candidate species as identified by federal and state agencies.

Policy 4: Designate within the UGA, frequently-flooded areas in accordance with Federal Emergency Management Act (FEMA) criteria.

Policy 5: Encourage the use of clustered development and other innovative designs that aim to preserve the functions of critical areas and further public safety.

Policy 6: Seek to protect the public and personal property from the effects of landslides, seismic hazard, steep slope failures, erosion, and flooding by private and public projects incorporating best available science into project design, avoiding or mitigating for potential impacts.

Policy 7: Continue to coordinate with federal, state, and local agencies and non-profit organizations to provide for critical area protection, protection of the public safety, and ongoing educational opportunities associated with critical areas.

Policy 8: Where avoidance measures are not possible for critical area impacts, ensure that mitigation measures include appropriate performance measures to provide successful implementation of mitigation and the maintenance of

functions and values of the applicable critical area consistent with best available science.

Policy 9: Promote ecosystem-based wildland fire planning and wildfire risk reduction policies for critical/environmentally sensitive areas.

GOAL 3: SHORELINES – *The goals and policies of the City of Wenatchee Shoreline Master Program (SMP) are incorporated by reference into this Comprehensive Plan.*

Policy 1: Maintain consistency between the City of Wenatchee Shoreline Master Program and the City of Wenatchee Urban Area Plan.

GOAL 4: WATER RESOURCES - *Undertake comprehensive efforts to conserve water, ensure adequate supplies, and improve water quality.*

Policy 1: Continue compliance with the federal Clean Water Act and National Pollutant Discharge Elimination System permits.

Policy 2: Employ low impact development practices where feasible through City projects, incentive programs, and new development and street standards.

Policy 3: Establish land use regulations that limit the amount of impervious surface area in lower density residential areas.

Policy 4: Continue to evaluate emerging technologies for feasibility with Wenatchee's public water supply, sewer treatment and storm water collection systems.

Policy 5: Adopt landscape and screening standards that conserve water through a variety of techniques including the use of native flora.

Policy 6: Continue encouraging connections to the City's sewer collection system for development within the city limits.

Policy 7: Continue protection and evaluation of safe development practices for the East Bank Aquifer to utilize the fullest potential of this valuable drinking water resource.

GOAL 5: AIR – *Protect and improve* ***the area's air quality.***

Policy 1: Implement a land use and transportation system that decreases the dependence on personal automobiles and increases the appeal of non-motorized transportation and mass transit.

GOAL 6: NOXIOUS WEEDS – *Prevent the spread of non-native plants and promote the use of native flora in landscaping.*

Policy 1: Develop a plant reference guide for landscaping that illustrates native species acclimated to our environment; helping conserve water resources and prevent the spread of invasive species.

Policy 2: Ensure that the City's *Landscape and Screening Ordinance* is compatible with the exclusive use of native flora in landscape plans.

Policy 3: Support the Chelan County Noxious Weed Control Board in efforts to control noxious weeds throughout the city.

GOAL 7: GREEN BUILDING – *Integrate natural and developed environments to create a sustainable urban community.*

Policy 1: Create informational documents with green building methods and local resources to aid new development in utilizing "green" techniques.

GOAL 8: WILDFIRES - Acknowledge the impacts that wildfires have on the Wenatchee Valley. Seek to develop and implement approaches to adapt to the risks of wildfires making the City of Wenatchee a more fire adaptive community.

Policy 1: Coordinate with regional stakeholders in the development and implementation of a City of Wenatchee wildfire protection plan and program.

Policy 2: Review the development code and land use recommendations of the Community Planning Assistance for Wildfire Program for the City of Wenatchee and Chelan County. Through a public process including key stakeholders balance these recommendations and potential amendments with the other policy components of the City of Wenatchee Urban Area Plan and community values.

Policy 3: Support the implementation of the Transportation Element, the Wenatchee Urban Area Motorized Transportation Circulation Map, and requirements for secondary access as improved circulation and access provides for more effective emergency response capabilities and public safety by providing the opportunity for residents to move away from harm while avoiding conflict with responding resources.

Policy 4: Consider allowing for design deviations from zoning standards in the primary wildland urban interface zones for residential and non-residential development where these deviations can be found to provide a greater fire-resistant construction method.

Policy 5: In coordination with public agencies and non-profit organizations, promote the alignment of ecological restoration and ecological based fire management with wildfire mitigation strategies to manage undeveloped open space/recreation areas.

Policy 6: Continue to coordinate with public water utility purveyors and the county to ensure that adequate fire flow and fire storage is available in the wildland urban interface.

Policy 7: Inventory and assess any historic structures within the primary zone of the wildland urban interface that may require special mitigation to promote resilience during a wildfire event.

Comprehensive Plan Exercise

Comprehensive Plan Worksheet

The Comprehensive Plan (also referred to as a General Plan, Master Plan, or Growth Policy) is a community's foundational local policy document that has a long-term planning horizon of 20 to 30 years. A Comprehensive Plan is broad in scope, and includes the community's vision statement for the future, an analysis of existing conditions and projected trends, and topic-specific chapters, or "elements."

Nuts and Bolts

Comprehensive Plans address land use, transportation, housing, natural resources, economy, infrastructure, natural hazards, and other social, economic, and environmental issues. A community implements each topic by developing a set of goals, objectives, and policy statements:

- **Goals** are broad statements that provide a long-term vision and serve as the foundation of the plan.
- **Objectives** are more specific statements of purpose that identify desired outcomes.
- **Policies** are detailed actions that direct plan stakeholders toward future implementation.

Best Practices for Incorporating Wildfire into the Comprehensive Plan

- ✓ Develop goals, objectives, and policies to address local wildfire planning concerns for the natural and built environment. Wildfire goals and policies can be in a single chapter or integrated throughout the plan.
- ✓ Goals (and policies) should address community safety, resilient housing, disaster preparedness and recovery, and other topics unique to the local community.
- ✓ Develop goals (and policies) that also recognize the important ecological role of fire on the landscape and how to protect natural resources, such as watersheds and forests.
- ✓ Ensure goals and policies for hazards are compatible with other policies, such as where growth is planned to occur in the community.
- ✓ Reference other plans that relate to wildfire, such as the Community Wildfire Protection Plan and/or Hazard Mitigation Plan, to steer the reader toward additional sources of information.
- ✓ Keep policies specific and action-oriented to implement goals and objectives, such as identifying land development regulations and incentives to support wildfire mitigation.

Local Tips

Colorado statutes authorize local governments to prepare Master (i.e., Comprehensive) Plans to serve as guiding documents. Counties with more than 10,000 in population and that meet defined growth percentages are required to adopt a Master Plan (C.R.S. § 30-28-106(4)(a)). Similarly, municipalities with a population of 2,000 people or greater in a qualifying county are also required to prepare and adopt a Master Plan (C.R.S. § 31-23-206(4)(a), House Bill 01S2-1006, 2011)).

Additional local information about including natural hazards in Comprehensive Plans is available through the Colorado Department of Local Affairs Planning for Hazards guidebook: www.planningforhazards.com.

Comprehensive Plan – Goals, Objectives, and Policies Exercise

Goals, objectives, and policies are unique to each community. **Goals** are often defined during a goal-setting exercise that engages community members in providing local input to the planning process. **Objectives and policies** are typically determined and/or reviewed by stakeholders who are more familiar with the subject matter. In the case of wildfire, stakeholders often include planners, public works staff, hazard mitigation specialists, emergency managers and first responders, natural resource specialists, land managers, and others.

Goal 1: [what is the overall desired outcome?] *Write the goal below:*
Objectives: [what are more specific outcomes of this goal?] *List 1-2 potential objectives below:*
Policies/Actions: [how will these objectives be achieved?] *List 2-3 potential policies below, providing as much detail as possible:*

Goal 2: [what is the overall desired outcome?] *Write the goal below:*
Objectives: [what are more specific outcomes of this goal?] *List 1-2 potential objectives below:*
Policies/Actions: [how will these objectives be achieved?] *List 2-3 potential policies below, providing as much detail as possible:*

Goal 3: [what is the overall desired outcome?] *Write the goal below:*
Objectives: [what are more specific outcomes of this goal?] *List 1-2 potential objectives below:*
Policies/Actions: [how will these objectives be achieved?] *List 2-3 potential policies below, provide as much detail as possible:*

Goal 4: [what is the overall desired outcome?] *Write the goal below:*
Objectives: [what are more specific outcomes of this goal?] *List 1-2 potential objectives below:*
Policies/Actions: [how will these objectives be achieved?] *List 2-3 potential policies below, provide as much detail as possible:*

Goal 5: [what is the overall desired outcome?] *Write the goal below:*
Objectives: [what are more specific outcomes of this goal?] *List 1-2 potential objectives below:*
Policies/Actions: [how will these objectives be achieved?] *List 2-3 potential policies below, provide as much detail as possible:*