TO: Deschutes County Board of County Commissioners  
FROM: Peter Russell, Senior Transportation Planner  
DATE: May 18, 2015  
RE: UofO review of County policies and regulations pertaining to wildfires and floods

**Background**
Deschutes County updated the Natural Hazards element of the Comprehensive Plan in 2011. Section 3.5 of the Comprehensive Plan sets County policies regarding natural hazards and references the Deschutes County Natural Hazards Mitigation Plan (NHMP). Specifically, Policy 3.5.1 requires regular review of the Natural Hazards component of the Comprehensive Plan.

The Planning Division has contracted with the University of Oregon (UO) Community Planning Workshop (CPW) to assist in this task. The CPW team has reviewed the Comprehensive Plan and the development code as they pertain to natural hazards. The CPW team, based on staff direction, has limited its assessment to the relevant chapters in Titles 15, 18 and 19 for how they address wildfires and flooding.

**Summary**
The purpose of the work session is for CPW to present their findings to the Board for general discussion. The CPW team, which is working under the supervision of myself and Matthew Martin, has spent several months in this effort. The CPW team has also researched, at both the regional and national level, model ordinances on the topic of jurisdictions using their policies and development codes to proactively minimize the potential harm from wildfires and floods.

The CPW team has worked closely with Will Groves, the County’s certified floodplain manager (CFM), and Ed Keith, County Forester, and Alison Green, Project Wildfire. The CPW team presented its findings to Deschutes County Planning Commission at work sessions on April 7 (floodplain) and April 23 (wildfire). Included in the packet for both work sessions were excellent resource documents with specific citations where County policy and/or code language could be revised.

**Conclusion**
CPW’s presentation to the Board will include recommendations for the Board’s consideration. Staff will await the Board’s direction on how to proceed.

Enclosures: May 8, 2015, memo from CPW to Board  
March 27, 2015, memo from CPW to Planning Commission  
April 9, 2015, memo from CPW to Planning Commission
May 11, 2015

To          | Deschutes County Board of County Commissioners
From        | Drew Pfefferle, Mike Howard, Bob Parker, and the CPW Team
SUBJECT     | Deschutes County Code Review

INTRODUCTION

The University of Oregon’s Community Planning Workshop (CPW) is working with Deschutes County Community Development Department (CDD) to conduct a review of the Deschutes County Development Code. The review ensures the County Code is consistent with direction provided in Comprehensive Plan Section 3.5 (Rural Growth/Natural Hazards) and the 2015 Natural Hazards Mitigation Plan update. The intent of this work is to assist Deschutes County to better understand development impacts in the flood and wildfire hazard areas and to provide a set of programmatic options to best manage those impacts.

This memorandum provides a brief overview of the project and presents research findings. The objective of this work session is to present and discuss significant policy options identified during the April 9th and April 23rd Planning Commission meetings for further analysis and review by the Board of County Commissioners (BOCC). A final report will be provided to the County in June.

BACKGROUND

The County is currently updating their Natural Hazards Mitigation Plan (NHMP) in an effort to prepare for the long-term effects resulting from natural hazards. The flood and wildfire hazards were assessed as part of this update to determine the risk to vulnerable systems within the county. The NHMP committee determined that while the county experiences flood events frequently, the county’s vulnerability to floods is low. The major areas of concern to the flood hazard are near Sisters, Tumalo, and between Sunriver and La Pine. The NHMP committee also determined that major wildfires occur with greater frequency than floods and threaten people and property throughout the county. For more information on the flood and wildfire hazards see the Planning Commission packets provided with this memo and the 2015 NHMP update.

A major driver of the county’s vulnerability to the flood and wildfire hazards is the county’s increasing population, which has increased by 41% over the last thirteen years (11% of the growth was in the rural, unincorporated, areas). According to Deschutes County’s population forecast, the county is anticipated to grow by 48% (78,286 people) by 2025 (33% of the growth is expected to be in the rural, unincorporated, areas). It is likely that most of the population growth within the rural, unincorporated, areas will be in wildfire hazard areas and some of the growth will occur in, or near, flood hazard areas.
**Review of County Development Code**

This section presents a review of Deschutes County’s current development code in regards to flood and wildfire land use mitigation policies and programs. This section also identifies potential options to strengthen current codes. A matrix is provided as an attachment that includes additional flood and wildfire options not covered here; you may opt to review the matrix for an overview of the options. To assist in the review of Deschutes County codes and determine potential policy options, CPW utilized model ordinances from the FEMA Model Washington NFIP-ESA Ordinance, the Oregon Model Floodplain Ordinance, the International Code Council (ICC), and the National Fire Protection Association (NFPA), along with relevant development codes and best practices from counties that have addressed similar flood and wildfire risks. These tools and documents are referenced throughout the report and can be found in the April 9th and April 23rd Planning Commission packets.

**Flood Development Code Options**

**Improving Flood Damage Insurance and Human Health**

**Best Practice:** Community Rating System (CRS) standards go beyond the minimum requirements of the National Flood Insurance Program (NFIP). Implementation of CRS supports and strengthens the insurance aspects of the NFIP and fosters a widespread approach to floodplain management. Deschutes County Community Development staff has stated that participation in the CRS is not financially feasible at this time. However, the following specific CRS higher standards are worth considering to reduce damages to property and public infrastructure, enhance public safety, reduce human suffering, avoid economic disruption and losses, and protect the environment:

- 432.e - Lower Substantial Improvements Threshold
- 432.d - Cumulative Substantial Improvements
- 431.a - Protecting Critical Facilities
- 432.a.(3) - Development Limitations

Utilizing these higher standards would add more clarity to the Deschutes County Code purposes section. This section of the code currently doesn’t provide enough detail on the financial impacts or human health aspects of flooding. Additionally, the Oregon Model Floodplain Ordinance has sample code language that provides an emphasis on human health and financial impacts.

**Applicable County Code:** Comprehensive Plan Policy 3.5.10, 18.96.010 Purposes

**Implications:** As stated, participation in the CRS may not be financially feasible at this time. However, implementing identifiable higher standards that are particularly relevant to Deschutes County will add targeted improvement to flood hazards. The County can choose not to participate in the CRS while still implementing several of the program’s higher standards that will have a direct benefit to residents.
Implementing a Combining Zone and Reducing Redundancy

**Best Practice:** Converting a base zone to a combining zone allows for each property within the zone to be appropriately designated based on the neighborhood. It would impart restrictions and conditional development that is subject to the flood hazard in accordance with FEMA regulations.

There are currently three sections in the Deschutes County Code that include floodplain regulations (two of which are combining districts): Chapter 18.96 County Zoning, Flood Plain Zone, Chapter 18.108 County Zoning, Urban Unincorporated Community Zone – Sunriver (in particular 18.108.190 Flood Plain Combining District), and Chapter 19.72 Bend Urban Growth Boundary Zoning Ordinance, Flood Plain Combining Zone. In order to reduce redundancy and eliminate the increased zoning legalities, merging the two zones within Chapter 18 would eliminate these issues.

**Applicable County Code:** Comprehensive Plan Policy 3.5.11 (f)

**Implications:** There are several issues created by having the Floodplain Zone as a base zone, which the County currently has in place. One particular issue is that properties within the Floodplain Zone may have a majority of the property in a different zone. This creates an issue of “split-zoning” and presents a number of code interpretation challenges. Creating a floodplain combining zone would help to reduce code interpretation challenges and potential code enforcement issues.

Improving Conditional and Prohibited Uses Within the Floodplain

**Best Practice:** Prohibiting storage of hazardous materials in the floodplain is critical in reducing the damage caused by floods. Stored materials can become debris during flooding when river currents dislodge and move materials across the floodplain. The Model Washington NFIP-ESA Ordinance offers explicit language for prohibiting hazardous materials in the floodplain.

The Model Washington NFIP-ESA Ordinance also provides specific language addressing critical facilities (hospitals, police stations, fires stations, emergency communication centers, etc.). Critical facilities are crucial to flood response activities, as well as to the health and safety of the public before, during, and after a flood event. Utilizing more specific language will ensure these facilities are sited outside the floodplain, unless no alternative exists.

**Applicable County Code:** 18.96.040 Conditional Uses Permitted, 18.96.050 Prohibited Uses, 18.96.080 Criteria to Evaluate Conditional Uses

**Implications:** Utilizing more specific language for hazardous materials and critical facilities will add to the safety and health of the public during and after a flood, which is one of the principles of Oregon Statewide Planning Goal 7.
Wildfire Development Code Options

Implement a Wildfire Hazard Combining Zone

Best Practice: Given the prevalence of wildfire risk within Deschutes County, applying development standards to individual base zones may not efficiently regulate development in hazardous areas. Several wildfire-affected cities and counties in the country, such as Ashland, OR and Jefferson County, CO, have adopted combining zones to broadly identify lands potentially at risk for wildfire and require mitigation measures as part of the land planning and development process. By implementing a combining zone in Deschutes County, development standards that mitigate wildfire risk could be more easily interpreted and applied.

Applicable County Code: Title 18 Zoning, 15.04.085 Building and Construction Codes and Regulations in Wildfire Hazard Zones

Implications: Implementing a combining zone would eliminate the need to individually prescribe wildfire provisions for each base zone. Wildfire Hazard Zones are currently depicted on the Deschutes County Wildfire Hazard Areas map, and County Code 15.04.085 already implements this map to apply roofing standards in a manner identical to the function of the proposed combining district. Developers and property owners will benefit from clear, consistent requirements that could be found in a single location within Deschutes County Code Title 18. This combining zone would also have implications that include higher wildfire mitigation measures being addressed to the majority of the county instead of only in Forest Zones.

Combining Zone: Prohibit Shake Roofs in Wildfire Hazard Zones

Best Practice: Wooden shake roofs pose a serious risk to residents in the event of a wildfire. Currently the County Code allows wooden shake roofs if they are Class B or higher. To attain a Class B rating, a shake roof must be treated with a fire-resistant material. However, this treatment deteriorates relatively quickly in the county’s climate conditions, and it is uncommon for homeowners to retreat their roofs as often as is necessary. The simplest way to address this issue is to prohibit shake roofing in areas of the county identified as Wildfire Hazard Zones. This practice would ideally be included as a provision applied within a Wildfire Hazard Combining Zone.

Applicable County Code: 15.04.085 Building and Construction Codes and Regulations in Wildfire Hazard Zones

Implications: Although wooden shake roofs can be treated and re-treated to meet Class B roofing standards, explicitly prohibiting new structures from using shake roofing is the most direct form of addressing the hazard inherent to flammable roofing material. Existing structures could be exempted from this requirement unless a homeowner undertook a significant re-roofing project. Regulatory or incentive-based approaches
could be considered as a means to replace ignitable shake roofs with non-combustible roofing material.

**Combining Zone: Requirements for Defensible Space**

**Best Practice:** Defensible space is one of the most effective ways to reduce the risk of structural loss from wildfires that spread into residential areas. Defensible space requirements can currently be found in a handful of places throughout Deschutes County Code. Forest Use Zones 1 and 2 require three zones of defensible space ranging from nonflammable materials in the immediate vicinity of dwellings and structures, to fuel management tactics between 20 and 100 feet. Defensible space is a crucial element of wildfire mitigation, and would ideally be included as a provision applied within a Wildfire Hazard Combining Zone.

**Applicable County Codes:** 17.16.030 Subdivision Information Requirements, 17.16.050 Master Development Plan, 18.113 Destination Resorts, 18.36.70 Fire Siting Standards in Forest Use Zones

**Implications:** Proper implementation and maintenance of defensible space could significantly decrease risk to residential development. However, if specific requirements were applied to all structures and dwellings within the Wildfire Hazard Overlay Zone, defensible space inspections could become very time consuming for County Inspectors.

**Combining Zone: Regulate Development on Steep Slopes**

**Best Practice:** Topography plays a significant role in the spread of wildfire. Fire spreads much more rapidly up slopes than flat ground, which poses a threat to structures situated on steep slopes. Currently, single-family dwellings are allowed on slopes as steep as 40 percent in Forest Use Zones. The International Code Council’s Wildfire Hazard Severity Form lists any slope greater than 30 percent as the maximum risk category. The best practice in regards to development on steep slopes is to regulate development above a certain slope threshold. To be consistent with existing code language, the County could set this threshold at 25-percent the maximum developable slope in Destination Resort Zones.

**Applicable County Code:** 18.36.070(C) Fire Siting Standards for Dwellings and Structures in Forest Use Zone 1, 18.40.070(C) Fire Siting Standards for Dwellings and Structures in Forest Use Zone 2, 18.113.070 Destination Resorts Zone

**Implications:** This best practice option, when combined with defensible space measures, can achieve enhanced resilience to wildfires without impinging on private property rights. Landowners and developers should be encouraged to develop on flat terrain to the greatest degree possible, but providing sensible regulations considers the inevitability of development on slopes.
Wildfire Mitigation Planning for Subdivisions and Destination Resorts

**Best Practice:** National Fire Protection Association 1141: Standard for Fire Protection Infrastructure for Land Development in Wildland, Rural, and Suburban Areas are nationally approved model standards for development of fire protection and emergency services infrastructure in wildland-urban interfaces. These standards include requirements for road access, 30 foot building separation, adequate levels of water supply and fire sprinkler systems.

**Best Practice:** National Fire Protection Association 1144: Standard for Reducing Structure Ignition Hazards from Wildland Fire are nationally approved model standards for assessing wildfire ignition hazards around existing structures. The standards provide requirements for new construction such as wildfire hazard assessments, mitigation and maintenance plan, and defensible space standards.

**Best Practice:** Achieve Firewise Standards or Firewise Recognition. Firewise is a non-regulatory program managed by the NFPA that provides principles or standards that include many NFPA 1141 and 1144 standards. They reflect standards to reduce wildfire ignition to the home through building materials and defensible space around the structure. Communities can receive Firewise Recognition by following five steps that include: a wildfire hazard assessment, creating a community task force, holding an annual Firewise Day, spending $2 per capita on Firewise projects, and submitting an annual report to Firewise documenting the community’s progress.

**Applicable County Code:** Title 17.16.030 Subdivisions: Informational Requirements and 18.113 Destination Resorts.

**Implications:** The County Code does not address specific wildfire mitigation requirements for Subdivisions or Destination Resorts. Chapter 18.113 for Destination Resorts does require a wildfire prevention, control and evacuation plan but does not include any specifications regarding that plan. The County could decide to include regulations from NFPA 1141 and 1144 to address adequate access for emergency responders, water supply, non-combustible building materials, defensible space, fire-resistant landscaping, and requirements for a mitigation plan as well as maintenance plan. Implementing standards identified from Firewise, or achieving Firewise recognition, would help ensure that communities prepare for wildfire mitigation prior to development and have a maintenance plan to continue to prevent wildfire risk to homeowners and their properties. These additional wildfire mitigation requirements could be viewed as restrictive and cause higher costs to developers however, achieving these standards can also be used as a successful marketing tool.

**Require Fire Protection Proof for Subdivisions**

**Best Practice:** Proof of Fire Protection is a best practice found in the Jefferson County, CO Land Development Regulation Section 4.C.18. It requires a written statement from the appropriate fire district indicating that they will serve the property. If the property is
not within a fire district, a contract with the district would need to be established indicating that fire protection to the property will be provided.

**Applicable County Code:** Title 17.16.030 Subdivisions: Informational Requirements

**Implications:** The County Code does not currently require proof of fire protection for subdivisions. Requiring proof of fire protection from a fire district to serve the development will help ensure that emergency responders will adequately be able to service the property. If a property is not currently provided fire protection service a contract, or annexation into a fire district, will help ensure fire protection can be provided. This policy could be restrictive to developers and cause service problems for fire districts however; it will ensure that adequate protection can be provided before property is developed.
ATTACHMENT A: MATRIX

The following matrix identifies the flood and wildfire policy options outlined in the memo.
<table>
<thead>
<tr>
<th>Policy Option</th>
<th>Deschutes County Code</th>
<th>Description</th>
<th>Issues Addressed</th>
<th>Applicability</th>
<th>Implications of Adoption</th>
<th>Planning Commission Comments</th>
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<tbody>
<tr>
<td>Lower Substantial Improvements</td>
<td>18.96.040(I) County Zoning, Conditional Uses Permitted</td>
<td>Adopt higher standards in accordance with Community Rating System (CRS) 432.e Lower Substantial Improvements Threshold with FEMA’s Higher Floodplain Management Regulatory Standards language.</td>
<td>The minimum requirement of the NFIP treats any structure that will incur improvements totaling more than 50% of the market value of the structure, as a new structure – meaning the structure will need to be elevated above base level elevation and meet other flood protection measures specified by the NFIP. Applying a lower substantial improvements threshold (example 25%, 40%, etc.) standard would require structures to comply with NFIP requirements if improvements met the lower threshold.</td>
<td>Adoption of the standard applies to expansion or substantial improvement of an existing dwelling, an agricultural related structure, a commercial, industrial or other non-residential structure, or an accessory building in a floodplain.</td>
<td>Adoption of the standard would increase the minimum requirement of the NFIP and treat any structure that incurs improvements totaling more than 50% of the market value of the structure as a new structure. May require additional staff time for permit assessment.</td>
<td>No comments were provided.</td>
</tr>
<tr>
<td>Cumulative Substantial Improvements</td>
<td>18.96.040(I) County Zoning, Conditional Uses Permitted</td>
<td>Adopt higher standards in accordance with Community Rating System (CRS) 432.d Cumulative Substantial Improvements with FEMA’s Higher Floodplain Management Regulatory Standards language.</td>
<td>The minimum requirement of the NFIP treats any structure that will incur improvements totaling more than 50% of the market value of the structure, as a new structure – meaning the structure will need to be elevated above base level elevation and meet other flood protection measures. Currently the standard is applied at each permit and does not account for cumulative improvements over time. Applying the standard to cumulative substantial improvement would apply the NFIP regulation for improvements over the lifetime of the structure.</td>
<td>Adoption of the standard applies to expansion or substantial improvement of an existing dwelling, an agricultural related structure, a commercial, industrial or other non-residential structure, or an accessory building in a floodplain.</td>
<td>Adoption of the standard would increase the minimum requirement of the NFIP and treat any structure that incurs improvements totaling more than 50% of the market value of the structure over the lifetime of the structure, as a new structure. Requires additional staff time for assessment and management of permits overtime.</td>
<td>Commission questioned number of properties this policy would apply to. An analysis will need to occur to document affected properties.</td>
</tr>
<tr>
<td>Critical Facilities</td>
<td>18.96.050 County Zoning, Prohibited Uses</td>
<td>Adopt higher standards in accordance with Community Rating System (CRS) 431.a Protecting Critical Facilities with Model Washington NFIP-ESA Ordinance (section 5.4, p. 39).</td>
<td>Critical facilities are crucial to flood response activities, as well as to the health and safety of the public before, during, and after a flood event.</td>
<td>Adoption of this policy applies to development of new critical facilities to ensure they are sited outside the floodplain, unless no alternative exists.</td>
<td>Adoption of critical facilities prohibition in the floodplain supports Deschutes County Comprehensive Plan Policy 3.5.6: “Critical facilities (schools, churches, hospitals and other facilities as defined by the Federal Emergency Management Agency) should be located outside high risk natural hazard areas, where possible.” May require additional staff time for permit assessment.</td>
<td>Commission interested in this policy regards to Waste Water Treatment Plant located in South County.</td>
</tr>
<tr>
<td>Hazardous Materials</td>
<td>18.96.040(8) County Zoning, Conditional Uses Permitted</td>
<td>Adopt higher standards in accordance with Community Rating System (CRS) 432.a.(3) Development Limitations as demonstrated in Model Washington NFIP-ESA Ordinance that offers explicit language for prohibiting hazardous materials in the floodplain.</td>
<td>Prohibiting storage of hazardous materials in the floodplain is critical in reducing the damage caused by floods. Stored hazardous materials can become debris during a flood event, and move across the floodplain causing contamination.</td>
<td>According to the Model Washington NFIP-ESA ordinance language; the “prohibition does not apply to small quantities of materials kept for normal household use. This prohibition does not apply to the continued operations of existing facilities and structures, reuse of existing facilities and structures, or functionally dependent facilities or structures.”</td>
<td>Adoption of hazardous materials storage prohibition in the floodplain supports Oregon’s Statewide Planning Goal 7 Implementation Guidelines: “Local governments should consider measures that exceed the National Flood Insurance Program (NFIP) such as: prohibiting the storage of hazardous materials in floodplains or providing for safe storage of such materials. Requires additional staff time for monitoring.</td>
<td>Commission concerned that policy as written does not cover existing structures. Question regarding if policy would apply to golf courses.</td>
</tr>
<tr>
<td>Policy Option</td>
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<td>Floodplain Combining Zone</td>
<td>18.96 County Zoning, Flood Plain Zone; 18.108 County Zoning, Urban Unincorporated Community Zone - Sunriver (in particular 18.108.190 Flood Plain Combining District); 19.72 Bend Urban Growth Boundary Zoning Ordinance, Flood Plain Combining Zone</td>
<td>Create a flood plain zone a combining zone. There are currently three sections in the Deschutes County Code that include floodplain regulations (two of which are combining districts): Chapter 18.96 County Zoning, Flood Plain Zone, Chapter 18.108 County Zoning, Urban Unincorporated Community Zone – Sunriver (in particular 18.108.190 Flood Plain Combining District), and Chapter 19.72 Bend Urban Growth Boundary Zoning Ordinance, Flood Plain Combining Zone. In order to reduce redundancy and eliminate the increased zoning legalities, merge the two zones within Chapter 18 to eliminate these issues.</td>
<td>Many properties near the river have some Floodplain Zoning with the property in various zones. This &quot;split-zoning&quot; presents a number of code interpretation challenges.</td>
<td>Make standards more transparent for developers and homeowners for new development and improvements on private land in Deschutes County.</td>
<td>Reduce the redundancy of two sections of Chapter 18 with floodplain regulations, and create one combining zone would help to eliminate code interpretation challenges and remove potential code enforcement errors.</td>
<td>Commissioners raised concern that policy would limit development. Discussion included the need to balance health and welfare with property rights.</td>
</tr>
<tr>
<td>Definitions</td>
<td>18.04 County Zoning, Definitions</td>
<td>Adopt Oregon Model Floodplain Ordinance language that defines: “Below-grade Crawl Space,” &quot;Conditional Letter of Map Revision (CLOMR),&quot; “Critical Facility,” “Elevated Building,” and &quot;Substantial Damage.”</td>
<td>Adoption of definitions specify meaning of commonly used words or phrases and reduce ambiguity.</td>
<td>Policy applies to applicable standards in order to be more transparent for developers and homeowners for new development and improvements on private land in Deschutes County.</td>
<td>Adoption of this policy will make standards more transparent for developers and homeowners.</td>
<td>No comments were provided.</td>
</tr>
<tr>
<td>Purpose Statement</td>
<td>18.96.010 County Zoning, Purposes</td>
<td>Adopt Oregon Model Floodplain Ordinance Section 1.3 Statement of Purpose to address economic impacts.</td>
<td>Expansion of the purpose statement illustrates the Deschutes County’s recognition of potential financial impact from flooding hazard ranging from mitigation efforts to loss of business interruptions.</td>
<td>Policy applies to county staff and administrative efforts to make financial impacts of flood hazards and mitigation efforts more transparent in Deschutes County.</td>
<td>Expansion of purpose statement to include economic impacts supports the Deschutes County Comprehensive Plan Section 3.5, Goal 1 “Protect people, property, infrastructure, the economy and the environment from natural hazards.”</td>
<td>No comments were provided.</td>
</tr>
<tr>
<td>Local Floodplain Administrator</td>
<td>18.96.020 County Zoning, Designated Areas; 18.96.070 County Zoning, Application for Conditional Use</td>
<td>Adopt Oregon Model Floodplain Ordinance Section 4.3 Duties and Responsibilities of the Local Administrator to ensure that the administrator’s duties and responsibilities are explicitly designated.</td>
<td>Explicitly designate local floodplain administrator and define duties and responsibilities to ensure that the elevation certificate, base flood elevation, and substantial damage requirements of the NFIP are referenced.</td>
<td>Policy applies to local floodplain administrator duties and responsibilities.</td>
<td>Adopt Oregon Model Floodplain Ordinance, Section 4.3, to address changes in 2014 Oregon Residential Specialty Code which removed NFIP duties from building code.</td>
<td>No comments were provided.</td>
</tr>
<tr>
<td>Below-Grade Crawl Spaces</td>
<td>18.96.070(E) County Zoning, Application for Conditional Use</td>
<td>Adopt Oregon Model Floodplain Ordinance Section 4.3.6 Non-Conversion of Enclosed Areas below the Lowest Floor to ensure that below-grade crawl spaces are identified as uninhabitable.</td>
<td>Enclosed areas below the lowest floor are not intended for human habitation and conversion of these areas to habitable space increases the risk to public health and safety.</td>
<td>Adoption of this policy applies to conditional use permits for any dwelling unit or structure in a floodplain.</td>
<td>Adoption of the policy would require such applicants to enter into a &quot;Non-conversion deed declaration for construction within flood hazard areas” or equivalent. The deed declaration would be recorded and be in a form acceptable to the Floodplain Administrator. May require additional staff time for permit process.</td>
<td>No comments were provided.</td>
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</tbody>
</table>
### Table A-1 Deschutes County Flood Mitigation Code Review Matrix (continued)

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<tr>
<td>Conditional Letter of Map Revision (CLOMR)</td>
<td>18.96.080(B) County Zoning, Criteria to Evaluate Conditional Uses</td>
<td>Adopt Oregon Model Floodplain Ordinance section 4.3.4(4) that states &quot;applicants shall obtain a Conditional Letter of Map Revision (CLOMR) from FEMA before any encroachment, including fill, new construction, substantial improvement, or other development, in the regulatory floodway is permitted.&quot;</td>
<td>Prevent alteration or relocation of water course without prior approval or notification to adjacent communities.</td>
<td>Adoption of this policy applies to criteria to evaluate conditional uses before any encroachment, including fill, new construction, substantial improvement, or other development in the floodplain.</td>
<td>Adoption of the policy would require the applicant to prepare technical data to support the Conditional Letter of Map Revision (CLOMR) application and pay processing or application fees to FEMA prior to any encroachment. May require additional staff time for permit assessment.</td>
<td>No comments were provided.</td>
</tr>
<tr>
<td>Crawl-Space</td>
<td>18.96.080(D)(4) County Zoning, Criteria to Evaluate Conditional Uses</td>
<td>Adopt Oregon Model Floodplain Ordinance section 5.2.6 Below-Grade Crawl Spaces that defines and specifies appropriate development ordinance if below grade crawlspaces are allowed.</td>
<td>The Oregon Model Floodplain Ordinance sections 5.2-6 explicitly lists specific requirements that creates more transparency for developers and homeowners for new development and improvements on private land in Deschutes County.</td>
<td>Adoption of this policy applies to criteria to evaluate conditional uses for below-grade crawl spaces in a floodplain.</td>
<td>Adoption of this policy regulates development in a floodplain &quot;because of hydrodynamic loads, crawlspace construction is not allowed in areas with flood velocities greater than five feet per second unless the design is reviewed by a qualified design professional, such as a registered architect or professional engineer.&quot; May require additional staff time for permit assessment.</td>
<td>Commissioners raised concern that reference of FEMA bulletin for policy option creates confusion when FEMA modifies regulations. Referencing third-party documents risks becoming outdated.</td>
</tr>
<tr>
<td>Access Roads</td>
<td>18.96.080(E) County Zoning, Criteria to Evaluate Conditional Uses</td>
<td>Adopt Model Washington NFIP-ESA Ordinance, Section 5.1.3 Subdivision, proposes subdivisions &quot;have at least one access road connected to land outside the Special Flood Hazard Area with the surface of the road at or above the flood plain elevation wherever possible.&quot;</td>
<td>The Deschutes County Code currently lacks regulations to ensure subdivisions have access roads that are both above the floodplain elevation and connect to land outside the floodplain.</td>
<td>Adoption of this policy applies to subdivisions development in a floodplain.</td>
<td>Adoption of policy supports Oregon's Statewide Planning Goal 7 Implementation Guidelines: &quot;Local governments should give special attention to emergency access when considering development in identified hazard areas.&quot; May require additional staff time for permit assessment.</td>
<td>No comments were provided.</td>
</tr>
<tr>
<td>Density and Open Space</td>
<td>18.96.080(E) County Zoning, Criteria to Evaluate Conditional Uses</td>
<td>Adopt Model Washington NFIP-ESA Ordinance, Section 5.1.3 Subdivision, that proposes subdivisions &quot;must have one or more new lots in the Special Flood Hazard Area set aside for open space use through deed restriction, easement, subdivision covenant, or donation to a public agency.&quot;</td>
<td>The Deschutes County Code requires all subdivision and partition proposals to &quot;be consistent with the need to minimize flood damage&quot; but fails to address density of development or adds a provision for open space.</td>
<td>Adoption of this policy applies to subdivision and partition proposals in a floodplain.</td>
<td>Adoption of density restriction and allocation of open space in the floodplain supports Oregon's Statewide Planning Goal 7 Implementation Guidelines: &quot;In adopting plan policies and implementing measures to protect people and property from natural hazards, local governments should consider: the benefits of maintaining natural hazard areas as open space, recreation and other low density uses.&quot; Could require additional costs to developers, however, can also be used as a useful marketing and real estate tool. May require additional staff time for permit assessment.</td>
<td>Commissioners raised concern that the policy option is impractical. Further discussion indicated that Deschutes County Flood mitigation regulation was not commensurate with FEMA. The policy presented is proposed at the local and federal standard levels.</td>
</tr>
<tr>
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<tr>
<td>Filed Notice on the Final Recorded</td>
<td>18.96.080(E) County</td>
<td>Adopt Model Washington NFIP-ESA Ordinance, Section 5.1(G) Subdivision, that proposes that the final recorded subdivision plat shall include a notice that part of the property is in the Special Flood Hazard Area.</td>
<td>Deschutes County Code does not currently require subdivisions located within the special flood hazard areas (floodplain), a riparian habitat zone, or a channel migration area to be accompanied by a filed notice on the final recorded subdivision plat.</td>
<td>Adoption of this policy applies to subdivision development in a floodplain.</td>
<td>Adoption of policy supports Oregon's Statewide Planning Goal 7 Implementation Guidelines: &quot;Local governments should evaluate the risk to people and property based on the new inventory information and an assessment of the types and intensities of land uses to be allowed in the hazard area.&quot; May require additional staff time for permit process.</td>
<td>No comments were provided.</td>
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<tr>
<td>Subdivision Plat</td>
<td>Zoning, Criteria to</td>
<td>Evaluate Conditional Uses</td>
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<tr>
<td>Maintenance Plan or Emergency Action</td>
<td>18.96.080(G)(2): County Zoning, Nonresidential Construction</td>
<td>Adopt Oregon Model Floodplain Ordinance section 5.2.2(6) and 5.2.2(7) proposes applicants supply a comprehensive Maintenance Plan and Emergency Action Plan (EAP) to assure flood proofing protection measures are maintained and that the operators of the building exercise a plan of action for the installation and sealing of the structure prior to a flood event.</td>
<td>Assure flood proofing protection measures are maintained and that the operators of the building exercise a plan of action for the installation and sealing of the structure prior to a flood event for nonresidential construction</td>
<td>Adoption of this policy applies to nonresidential construction in a floodplain.</td>
<td>Adoption of policy requires additional staff time for individual assessments, provides specific mitigation and response action items for property to address.</td>
<td>No comments were provided.</td>
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<td>Plan</td>
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<td>Manufactured Home</td>
<td>18.96.080(G)(3), County Zoning, Manufactured Homes</td>
<td>Adopt Oregon Model Floodplain Ordinance section 5.2.3(4) states that manufactured dwellings shall be anchored to prevent flotation, collapse, and lateral movement during the base flood and electrical crossover connections shall be a minimum of 12-inches above base flood elevation.</td>
<td>Include additional standard for the elevation of electrical crossover connections to be at least 12-inches above base flood elevation</td>
<td>Adoption of this policy applies to manufactured homes located in the floodplain.</td>
<td>Adoption of policy supports Deschutes County Comprehensive Plan Section 3.5, Goal 1 &quot;Protect people, property, infrastructure, the economy and the environment from natural hazards,&quot; but requires additional staff time for individual assessment.</td>
<td>No comments were provided.</td>
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<tr>
<td>Wildfire Hazard Combining Zone</td>
<td>15.04.085 Building and Construction Codes and Regulations; Wildfire Hazard Zones</td>
<td>Given the prevalence of wildfire risk within Deschutes County, applying transparent and effective standards to each individual base zone may not be the most effective means of regulating development. By implementing an overlay district in Deschutes County, development standards for mitigating wildfire risk could be more easily interpreted and applied.</td>
<td>Adoption of the Wildfire Hazard Areas map implements the provisions of the Wildfire Hazard Mitigation Section of the Oregon Residential Specialty Code</td>
<td>All new development on private land in Deschutes County</td>
<td>Eliminates the need to individually prescribe wildfire provisions for each base zone. Provides clear, consistent requirements for developers and property owners. Will require most of the County to now follow higher wildfire regulation standards instead of only the Forest Zones.</td>
<td>Commission was interested to see a potential hazard tiering system.</td>
</tr>
<tr>
<td>Roofing Standards</td>
<td>15.04.085, 15.04.085 Building and Construction Codes and Regulations in Wildfire Hazard Zones</td>
<td>In order to maintain fire resistance of shake roofs, frequent retreatments are required. Since it is unlikely that homeowners will treat their roofs as often as necessary, we recommend the County consider specifically prohibiting shake roofs within 15.04.085.</td>
<td>Wooden shake roofs pose a serious risk to residents in the event of a wildfire. Current County Code allows wooden shake roofs if they are Class B or higher. To attain a Class B rating, a shake roof must be treated with a fire-resistant material. However, this treatment deteriorates relatively quickly in the County’s climate conditions, and it is uncommon for homeowners to retreat their roofs as often as is necessary.</td>
<td>New construction, roof replacements. Would require Class A fire rated materials.</td>
<td>Although wood shake roofs can be treated and re-treated to meet Class B roofing standards, explicitly prohibiting new structures from using shake roofing is the most direct form of addressing the hazard inherent to flammable roofing material. Existing structures could be exempted from this requirement unless a homeowner undertook a significant re-roofing project. Requires Class A materials.</td>
<td>Commission was very interested in this topic. Retroactive application was a topic of conversation, citing Sunriver’s mandatory Class A fire rated materials for roofing.</td>
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<tr>
<td>Steep Slopes</td>
<td>18.36.070 Fire Siting Standards for Dwellings and Structures in Forest Use Zone</td>
<td>Set a slope grade threshold above which development requirements, such as augmented defensible space, must be met. To be consistent with existing code language, the County could set this threshold at 25 percent. This threshold and its requirements would ideally be included as a provision applied within a Wildfire Hazard Combining Zone.</td>
<td>Fire spreads much more rapidly up slopes than flat ground, which poses a threat to structures situated on steep slopes. Currently, single-family dwellings are allowed on slopes as steep as 40% in Forest Use Zones. The best practice in regards to development on steep slopes is to regulate development above a certain slope threshold.</td>
<td>Applicable to new developments. There are not many developable properties with slopes greater than 25%; a full analysis has yet to be completed.</td>
<td>This best practice option, when combined with defensible space measures, can achieve enhanced resilience to wildfires without impinging on private property rights. Landowners and developers should be encouraged to develop on flat terrain to the greatest degree possible, but providing sensible regulations considers the inevitability of development on slopes.</td>
<td>No comments were provided.</td>
</tr>
<tr>
<td>Defensible Space</td>
<td>17.16.030(C)(12) Informational Requirements for Subdivisions</td>
<td>Requirements currently stated in 18.36.070. Suggestion to include requirements in Subdivisions and Destination Resorts as well as include requirements for fire-resistant landscaping.</td>
<td>Defensible space standards are not mentioned for Subdivisions and Destination Resort requirements. Defensible space standards listed in 18.36.070 for Forest Zones do follow NFPA and Firewise standards but do not include fire-resistant landscaping requirements which is a key proven factor in maintaining effective defensible space.</td>
<td>Applicable to new developments.</td>
<td>Decreased risk to residential development, however, an increase of staff time to County Inspector. Homeowners will be responsible for maintenance of their defensible space.</td>
<td>Commission voiced concern about the 100 to 200 foot buffer zone. Commission was also interested in including defensible space requirements for Subdivisions and Destination Resorts and wanted fire-resistant landscaping to be addressed.</td>
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<td>Subdivision Fire Protection (NFPA 1141)</td>
<td>17.16.030(C)(12) Informal Requirements for Subdivisions 17.16.050 Master Development Plan 18.113.060 Destination Resorts</td>
<td>The County may want to consider including a provision for Subdivisions and Destination Resorts that requires areas at risk of wildfires to achieve specific NFPA 1141 standards. Standards include requirements for subdivision access, building separation, fire protection, and water supply.</td>
<td>Standards would address national best practices for emergency access requirements, road grades, building separation to reduce the spread of wildfire, water supply, building materials, and wildfire mitigation planning before development.</td>
<td>Applicable to new developments.</td>
<td>Provides additional protection from wildfire risk. Could require additional costs to developers, however, can also be used as a useful marketing and real estate tool.</td>
<td>No comments were provided.</td>
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<tr>
<td>Structure Ignition Fire Protection (NFPA 1144)</td>
<td>17.16.030(C)(12) Informal Requirements for Subdivisions 17.16.050 Master Development Plan 18.113.060 Destination Resorts</td>
<td>The County may want to consider including a provision for Subdivisions and Destination Resorts that requires areas at risk of wildfires to achieve specific NFPA 1144 standards. Standards include requirements such as reducing structure ignition through defensible space zones, non-combustible construction materials, hazard mitigation assessments, and wildfire mitigation action and maintenance plans.</td>
<td>Standards would address national best practices for emergency access requirements, road grades, building separation to reduce the spread of wildfire, water supply, building materials, and wildfire mitigation planning before development.</td>
<td>Applicable to new developments.</td>
<td>Provides additional protection from wildfire risk. Could require additional costs to developers, however, can also be used as a useful marketing and real estate tool.</td>
<td>No comments were provided.</td>
</tr>
<tr>
<td>Firewise Recognition</td>
<td>17.16.030(C)(12) Informal Requirements for Subdivisions 18.113.060 Destination Resorts</td>
<td>Firewise Recognition or becoming a Firewise Community would help subdivisions create neighborhood action plans to mitigate wildfire from the beginning of development.</td>
<td>Requirement would address consistent standards for all Subdivisions and Destination Resorts to create wildfire mitigation plans before development and maintain standards in perpetuity.</td>
<td>Applicable to new developments.</td>
<td>Earns neighborhood national recognition, can reduce insurance premiums, protects community from wildfire risk. Could require additional costs to developers, however, can also be used as a useful marketing and real estate tool.</td>
<td>Commission said this translates well to increased property values and increased safety.</td>
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<tr>
<td>Fire Protection Proof</td>
<td>17.16.030(C)(12) Informal Requirements for Subdivisions</td>
<td>In addition to requiring a proposed fire protection system it would be beneficial to include Fire Protection Proof. Fire Protection Proof requires the applicant to show proof that the property is located within a fire protection district that will serve the property. (Jefferson County, CO)</td>
<td>This requirement would address assurance that a fire district could have the capability to service the property. If adequate level of service could not be provided, this would alert the fire districts to plan which department could provide the service or if annexation or a new district would need to be created.</td>
<td>Applicable to new developments.</td>
<td>Requiring applicants to prove they are protected by a fire protection district appears to place extra administrative pressure on rural fire districts. However, requiring fire protection information prior to subdivision approval can shed light on potential issues that could arise as a result of overloading a rural fire district.</td>
<td>No comments were provided.</td>
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<tr>
<td>Firewise Protection Standards</td>
<td>17.16.030(C)(12) Informal Requirements for Subdivisions 18.113.060 Destination Resorts</td>
<td>Firewise standards include: nonflammable roofing materials, requirements for windows, vents, and attachments, Firewise plants, defensible space, and landscape maintenance.</td>
<td>Standards would ensure developments follow national best practice models to reduce wildfire risk by using non-flammable construction materials and fire-resistant landscaping.</td>
<td>Applicable to new developments.</td>
<td>Provides additional protection from wildfire risk. Could require additional costs to developers, however, can also be used as a useful marketing and real estate tool.</td>
<td>No comments were provided.</td>
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<td>Fire Apparatus Access</td>
<td>17.36.260 Fire Hazards</td>
<td>The Deschutes County Code currently requires a minimum of two points of access to a subdivision in a fire hazard area. ICC International Wildland-Urban Interface Code includes additional standards for fire apparatus access in subdivisions. We recommend The County consider these higher standards to ensure adequate access in future subdivisions. Requirements currently found in 18.36.080. We suggest these same requirements be applied to 17.36.260.</td>
<td>These requirements would explicitly state higher access requirements to be addressed for Subdivisions as listed in the ICC code and in 18.36.260.</td>
<td>Applicable to new developments.</td>
<td>The costs associated with providing additional points of access can be considered by developers as barriers to development. However, higher standards for access help prevent the loss of structures and ensure the safe ingress and egress of fire crews, emergency personnel, and residents.</td>
<td>Commission wanted to clarify that this applies to developments with over 600 dwelling units. Staff will determine the appropriate scale of development to apply this standard.</td>
</tr>
<tr>
<td>Road/Address Identification Signs</td>
<td>18.36.080 Fire Safety Design Standards for Roads in Forest Use Zone 1 &amp; 2</td>
<td>The Code does not include language to address road identification signs or markers. Proper signage is important for emergency responders to quickly locate and identify a residence. We recommend the County consider including policies on road and address marking. The International Wildland-Urban Interface Code section 403.4 and 403.6 provide specific language addressing road and address marking.</td>
<td>This requirement would include requirements for proper signage for emergency responders that currently does not exist and would help identify locations in need of emergency.</td>
<td>Applicable to new developments.</td>
<td>Creates accessible signage for emergency responders to quickly locate and identify residences.</td>
<td>Increases visibility and correct address identification and location in time-sensitive emergency responses. Desire to include same requirement on long private driveways with multiple residences.</td>
</tr>
<tr>
<td>Wildland Fire Hazard Assessment</td>
<td>18.36.40(B) Conditional Use in Forest Use Zone 1 &amp; 2</td>
<td>This section does not indicate how the increase in fire hazard, fire suppression costs, or risk to fire suppression personnel would be measured. We suggest the County consider including language stating the fire hazard risk would be determined by a wildland fire hazard assessment. Examples of this language and assessment can be found in NFPA 1144 Chapter 4 and the ICC International Wildland-Urban Interface Code.</td>
<td>A Wildfire Hazard Assessment imitated before development would identify the level of risk to a property and ensure adequate mitigation standards are obtained before construction and occupancy.</td>
<td>Applicable to new single-family dwellings.</td>
<td>Additional staff time for individual assessments, provides specific mitigation action items for property to address before development</td>
<td>No comments were provided.</td>
</tr>
<tr>
<td>Wildfire Mitigation Plans</td>
<td>18.36.05(A) Standards for Single-Family Dwellings in Forest Use Zone 1 &amp; 2 18.124.040(D) Site Plan Review</td>
<td>Due to the frequency with which homes are being built in wildland areas of Deschutes County, requiring Wildfire Mitigation Plans may be a useful addition to the site plan review process. We recommend the County consider including Wildfire Mitigation Plans as required contents for the site plan review process could minimize the loss of lives and property from wildfires. (Kane County, UT; Boulder County, CO; NFPA 1144 Chapter 4.3)</td>
<td>Wildfire Mitigation Plans would ensure an action and maintenance plan in regards to wildfire be developed prior to construction and occupancy. This would ensure that the homeowner considers wildfire mitigation planning and maintenance before development and in perpetuity.</td>
<td>Applicable to new single-family dwellings.</td>
<td>Creates a wildfire mitigation plan at the time of development. Builds and develops land to NFPA standards. Requires additional effort from homeowners and developers as well as restrictions to design.</td>
<td>No comments were provided.</td>
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Table A-2 Deschutes County Wildfire Mitigation Code Review Matrix (continued)

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<tr>
<th>Policy Option</th>
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<tr>
<td>Fire Prevention and Control Plans</td>
<td>Section 17.16.050 Master Development Plan</td>
<td>The Master Development Plan does not include a requirement for wildfire treatment in the wildfire hazard zone. Fire Prevention and Control Plans address water supply, access, building ignition and fire-resistance factors, fire protection systems and equipment, defensible space, and vegetation management. (City of Ashland / International Wildland-Urban Interface Code)</td>
<td>Fire Prevention and Control Plans address Subdivisions that did not have clear wildfire prevention plans in place before development. Clear standards and requirements for this plan would help developers with their design plan and ensure that maintenance of these standards remain in perpetuity.</td>
<td>Applicable to new developments.</td>
<td>Provides clear expectations for developers, wildfire planning considered in early phases of planning</td>
<td>No comments were provided.</td>
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</table>
INTRODUCTION

The Community Planning Workshop (CPW) is working with the Deschutes County Community Development Department (CDD) to review sections of the Deschutes County Development Code consistent with direction provided in Comprehensive Plan Section 3.5 (Rural Growth/Natural Hazards). The review will focus on improving development regulations that address wildfire, flood, and other natural hazards.

Task 4 of our work program requires CPW to facilitate work sessions with the Planning Commission and the Board of County Commissioners (BOCC) to present policy and programmatic options for further analysis and review. This memorandum provides an overview of the project and presents research findings to the Planning Commission in regards to wildfire management for the April 23rd work session. In addition to this work session, CPW held a work session on April 9 discussing flood code review. Following these work sessions CPW will hold a work session with the BOCC on May 18. This work session has three objectives: (1) Identify the current wildfire risks in Deschutes County; (2) Review the County’s existing wildfire programs; (3) Present for discussion potential policy options in regards to wildfire management.

To assist in the review of County codes and determine potential policy options CPW utilizes model ordinances from the International Code Council (ICC) and the National Fire Protection Association (NFPA), as well as relevant development codes and best practices from counties that have addressed similar wildfire risks. In addition to model ordinance comparisons, CPW compares Deschutes County Code to goals stated in the Deschutes County Comprehensive Plan, Community Wildfire Protection Plans, and Natural Hazard Mitigation Plan.

BACKGROUND

Deschutes County updated the Natural Hazards element of its Comprehensive Plan in 2011. Section 3.5 of the Deschutes County Comprehensive Plan establishes County policy with respect to natural hazards. The comprehensive plan cross-references the Natural Hazards Mitigation Plan (NHMP) as well as seven Deschutes County Community Wildfire Protection Plans (CWPPs). Policy 3.5.1 specifically addresses maintenance of the Goal 7 Comprehensive Plan Element as well as the NHMP and CWPPs:

Adopt by reference the most recent Deschutes County Natural Hazards Mitigation Plan into this Plan.
a) Review and evaluate this Section of the Comprehensive Plan every five years.

b) Adopt by reference Community Wildfire Protection Plans and revisions into this Plan.

In summary, Policy 3.5.1 clearly articulates the County’s commitment to address natural hazards and establishes mechanisms for coordinating the Comprehensive Plan with the NHMP and CWPPs. Furthermore, this project assists Deschutes County with a review and analysis of Comprehensive Plan Section 3.5 to ensure consistency with the NHMP Update and the following policies:

Policy 3.5.4 Provide Incentives and if needed regulations, to manage development in areas prone to natural hazards.

Policy 3.5.11 Review and revise County Code as needed to:

a. Ensure that land use activities do not aggravate, accelerate or increase the level of risk from natural hazards.

b. Address wildfire concerns to and from development, through consideration of site location, building construction and design, landscaping, defensible space, fuel management, access and water availability.

c. Require development proposals to include an impact evaluation that reviews the ability of the affected fire agency to maintain an appropriate level of service to existing development and the proposed development.

d. Minimize erosion from development and ensure disturbed or exposed areas are promptly restored to a stable, natural and/or vegetated condition using natural materials or native plants.

e. Endure drainage from development or alterations to historic drainage patterns do not increase erosion on-site or on adjacent properties.

f. Make the Floodplain Zone a combining zone and explore ways to minimize and mitigate floodplain impacts.

g. Require new subdivisions and destination resorts to achieve Firewise standards from the beginning of the projects and maintain those standards in perpetuity.

Specifically, this project is a review of the Deschutes County Development Code consistent with guidance provided in policies 3.5.4 and 3.5.11 of the Deschutes County Comprehensive Plan. The focus of this project is to identify policy and programmatic options for consideration by the Board of County Commissioners (BOCC), Planning Commission, staff, stakeholders, and partner organizations. The options will be described in a final report to CDD and structured in a manner
that staff can include them in future annual CDD work programs. After completion of the CPW report in June 2015, CDD staff will work with County decision makers to identify policy and code language for potential adoption into the comprehensive plan or development code.

**WILDFIRE RISK IN DESCHUTES COUNTY**

Wildfires are a natural and necessary component of many ecosystems across the country. Central Oregon is no exception. Historically, wildfires have shaped the forests and wildlands valued by residents and visitors. These ecosystems are significantly altered due to fire prevention efforts, modern suppression activities and a general lack of large scale fires, resulting in overgrown forests and wildland-urban interfaces with dense fuels that burn more intensely than in the past. Wildfires can be divided into three categories: interface, wildland, and firestorms. Interface fires are the most likely wildfires to happen in Deschutes County.

Interface fires occur where wildland and developed areas meet (the wildland-urban interface). In these locations, both vegetation and structural development combine to provide fuel. The wildland-urban interface can be divided into three categories: classic wildland-urban interface, mixed wildland-urban interface, and occluded wildland-urban interface.

1. Classic wildland-urban interface exists where well-defined urban and suburban development presses up against open expanses of wildland areas.
2. Mixed wildland-urban interface is found in areas of exurban or rural development: isolated homes, subdivisions, resorts and small communities situated in predominantly wildland settings.
3. Occluded wildland-urban interface where islands of wildland vegetation exist within a largely urbanized area.

**DEVELOPMENT LOCATION AND RATE OF DEVELOPMENT**

Between 2000 and 2013 population in Deschutes County increased 40.9%, a total population of 162,525. According to Deschutes County’s population forecast between 2013 and 2025, the County’s population is anticipated to grow by 48.2% (78,286 people), a total population of 240,811. The City of Bend is expected to account for 40% of the population growth, while the rural (non-incorporated) areas of the County are expected to account for 33% of the population growth.

Some of the population growth has occurred in interface areas. The increase in residential development in interface areas has also increased the risk of wildfires. Fire has historically been a natural wildland element and can sweep through vegetation that is adjacent to a combustible home. New residents in remote locations are often surprised to learn that in moving away from built-up urban areas, they have also left behind readily available fire services providing structural protection.

Unprotected residential development is an important issue for Deschutes County. There are several examples of residential developments that do not have structural or wildland fire protection. These include the Lower Bridge area east of Sisters, and the Brothers and Hampton
areas along Highway 20 on the eastern edge of the County. In addition, there are approximately 100,000 acres of privately owned, largely unimproved rangeland east of Bend that do not have wildland fire protection.

Because these types of areas have no fire protection organizations and because of the light, flashy nature of the fuel types present in some areas, wildland fires have the potential to grow quite large often spreading to the point where they become a threat to protected areas. Deschutes County developed County Code Section 8.21 that outlines a system for private landowners in unprotected areas to respond to the wildland fire threat with defensible space and fire-breaks.

There are substantial resource commitments and fiscal costs associated with emergency response to wildland fire incidents. This impact on local organizations was demonstrated by the multiple agency organizational response each fire season. Notable recent incidents that exemplify the impact on local organizations are Pole Creek (2012), Burgess Road (2013), and Two Bulls (2014). The costs associated with multiple day mobilization of law enforcement, search and rescue, structural fire assets and state fire resources can quickly deplete local and state agency budgets. Residential evacuation triggers American Red Cross mobilization and when major transportation routes are impacted, Oregon Department of Transportation and County Road Department personnel are also mobilized. Depending on the scope and specifics of an individual fire, additional agency and non-governmental support organizations may also be mobilized to help mitigate the impact on citizens and community infrastructure.

**MODEL ORDINANCES**

CPW used the following federal and state model ordinances in the process of reviewing the County’s development code:

**National Fire Protection Association (NFPA) 1141, Standard for Fire Protection Infrastructure for Land Development in Wildland, Rural, and Suburban Areas:** This standard provides guidance on the development of the community infrastructure necessary to eliminate fire protection problems that result from rapid growth and change.

**National Fire Protection Association (NFPA) 1144, Standard for Reducing Structure Ignition Hazards from Wildland Fire:** This standard provides guidance on individual structure hazards. It requires a new spatial approach to assessing and mitigating wildfire hazards around existing structures and includes improved ignition-resistant requirements for new construction.

**International Wildland-Urban Interface Code (2012):** This comprehensive wildland-urban interface code establishes minimum regulations for land use and the built environment in designated wildland-urban interface areas using prescriptive and performance-related provisions. It is founded on data collected from tests and fire incidents, technical reports and mitigation strategies from around the world.
EXISTING COUNTY WILDFIRE PROTECTION PROGRAMS

Community Wildfire Protection Plans

The Community Wildfire Protection Plans (CWPPs) allow communities to identify wildland-urban interface areas and prioritize hazardous fuels reduction projects and other measures to help them survive a wildland fire. Stakeholders have developed CWPPs for each of the four incorporated cities (and surrounding areas) in the County (Greater Bend, Greater La Pine, Greater Redmond, Greater Sisters Country) and three other regions (East and West Deschutes County, Sunriver, and Upper Deschutes River Coalition). These plans are developed by the community members and facilitated through the organization Project Wildfire.

Natural Hazard Mitigation Plan

Deschutes County developed a multi-hazard Natural Hazards Mitigation Plan (NHMP) in an effort to prepare for the long-term effects resulting from natural hazards including wildfire. The NHMP is intended to assist Deschutes County reduce the risk from natural hazards by identifying resources, information, and strategies for risk reduction. It is also intended to guide and coordinate mitigation activities throughout the County. The draft May 2015 update of the NHMP identifies three proposed wildfire action items for Deschutes County: (1) expansion of public information/education initiatives in support of active hazardous fuels treatment; (2) review and upgrade existing building and land use codes to address landscape, fuel amounts and structure detail that reduces the incidence or spread of wildland fire in urban/rural interface areas; and (3) continue prioritization and support fuels reduction projects on private lands utilizing FireFree and other programs, and identify and prioritize fuels reduction projects on public lands in the wildland-urban interface.

Project Wildfire

Project Wildfire is the result of a Deschutes County effort to create long-term wildfire mitigation strategies and provide for a disaster-resistant community. Its mission is to prevent deaths, injuries, property loss and environmental damage resulting from wildfires in Deschutes County. Created by Deschutes County Ordinance 8.24.010, Project Wildfire is the community organization that facilitates, educates, disseminates and maximizes community efforts toward effective fire planning and mitigation. Project Wildfire is governed by a 27-member steering committee that is defined by County Ordinance 8.24.020 as a balanced mix between fire agency representatives, private residents, elected officials, Deschutes County 911, Deschutes County Emergency Management, Insurance, and many other at large community members.

Project Wildfire organizes community events that help educate the community about wildfire protection strategies and techniques. Project Wildfire coordinates the FireFree program\(^1\). FireFree is an educational program that teaches residents how to protect their homes from wildfire. Project Wildfire has successfully implemented projects identified in the Community

\(^1\) For more information see http://firefree.org/
Wildfire Protection Plans by reducing hazardous fuel with grant money received from national and state programs. The FireFree program and fuels reduction projects yield over 40,000 cubic yards of woody debris each year. Project Wildfire, in conjunction with the Central Oregon Fire Chiefs Association, develops a vital evacuation guide for the communities called “Plan, Prep, Go.” that helps save lives. Project Wildfire also works with developing destination resorts in order to ensure compliance with development standards to become a Firewise Community. Firewise Communities are nationally recognized communities that have taken an organized approach to wildfire preparedness. Typically, these areas have defensible space, evacuation routes, and community cohesion.

**Senate Bill 360**

Although not technically a County program, Senate Bill 360, or the Oregon Forestland-Urban Interface Fire Protection Act of 1997, applies to properties within the Oregon Department of Forestry’s protection district. Senate Bill 360 requires property owners in identified wildland-urban interface areas to reduce excess vegetation around structures and driveways. Some cases also require fuel breaks to be created along property lines and roadsides. Owners are notified by the Oregon Department of Forestry to comply with fuel reduction standards within two years and mail back a certification form upon completion. Certification relieves the owner from fire cost-recovery liability if a fire originates on their property.

**Review of County Comprehensive Plan Policies**

This section presents a review of the Deschutes County Comprehensive Plan in regards to land use and wildfire hazard mitigation policies and programs. The existing comprehensive plan policy language is shown in *italics* followed by our comments.

**Comprehensive Plan Policy 3.5.11(g):**

*Policy 3.5.11 Review and revise County Code as needed to:*

*g. Require new subdivisions and destination resorts to achieve FireWise standards from the beginning of the projects and maintain those standards in perpetuity.*

**Comment:** The Firewise program is inherently flexible since it is a national recognition program; it is not a certificate program and does not have standards to be met. The standards of the National Fire Protection Association (NFPA) 1141 and 1144 (described herein) provide specific language that may be more applicable to Deschutes County. It may be worth modifying the comprehensive plan to reference this distinction. In section 17.16.030 we discuss an option to enhance the existing Deschutes Code to help clarify this distinction.

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2 For more information see [http://firewise.org](http://firewise.org)
**Review of County Development Code**

This section presents a review of the County’s current development code in regards to land use and wildfire mitigation policies and programs and identifies potential actions to strengthen current codes. In the following section the existing development code language is shown in *italics* followed by our comments. Model development code is shown in *italics and underlined*.

**Title 15: Buildings and Construction**

Though the scope of our code review is not specifically targeted to building codes, we have provided a comment in regards to Wildfire Hazard Zone-specific building standards.

**15.04.085 Wildfire Hazard Zones**

A. Wildfire Hazard Zones are those depicted on the Deschutes County Wildfire Hazard Areas map on file with the County Clerk.

B. Adoption of the Wildfire Hazard Areas map implements the provisions of the Wildfire Hazard Mitigation Section of the Oregon Residential Specialty Code enforced pursuant to DCC 15.04.010(A).

**Comment:** The provisions of the Wildfire Hazard Mitigation Section of the Oregon Residential Specialty Code enacted within 15.04.085 include requirements that:

*All buildings regulated by this code in wildfire hazard zones shall have Class A or B roofing according to section 1506.*

The County Building Official has advised that shake roofs are permitted if Class B or higher. For a shake roof to achieve Class B, it must be treated with a fire-resistant material. While this treatment sounds like effective mitigation, he noted that the treatment deteriorates relatively quickly in the County’s climate conditions. In order to maintain fire resistance of shake roofs, frequent retreatments are required. Since it is unlikely that homeowners will treat their roofs as often as necessary, we recommend the County consider specifically prohibiting shake roofs within 15.04.085.

**Title 17: Subdivisions**

This section reviews Title 17 in regards to land use and wildfire mitigation policies programs and identifies options for the County to strengthen current language.

**17.16.030 Informational Requirements**

17.16.030(C)(12). Proposed fire protection system for the subdivision.

**Comment (1):** In addition to requiring a proposed fire protection system it would be beneficial to include Fire Protection Proof. Fire Protection Proof requires the applicant to show proof that the property is located within a fire protection district that will serve the property. An example
of code language that identifies Fire Protection Proof can be found in the Land Development Regulations of Jefferson County, CO Section 4.C.18:

Fire Protection Proof: A written statement from the appropriate fire district, indicating that they serve the referenced property. If the property is not located within a fire protection district, a contract with a district or a municipality indicating that they will provide service to the property shall be required.

Comment to model ordinance: CDD may want to consult with the fire districts to determine the mechanics and feasibility of a contract (annexation) and to determine their willingness to serve areas outside of their existing territory. A key issue to address is whether the contract would deprive landowners of economic use of their land.

Comment (2): Comprehensive Plan Policy 3.5.11(g) requires new subdivisions and destination resorts to achieve FireWise Standards from project onset and to maintain those standards in perpetuity (modification of this policy is discussed above). The Firewise program is inherently flexible since it is a national recognition program; it is not a certificate program and does not have standards to be met. The standards of the National Fire Protection Association (NFPA) 1141 and 1144 (described herein) provide specific code language that may be more applicable to Deschutes County. The County may want to consider modifying the Informational Requirements to require areas at risk of wildfires to achieve specific NFPA 1141 and 1144 standards and/ or achieve FireWise recognition.

Section 17.16.050 Master Development Plan

An overall master development plan shall be submitted for all developments affecting land under the same ownership for which phased development is contemplated. The master plan shall include, but not limited to, the following elements:

A. Overall development plan, including phase or unit sequence;

B. Show compliance with the comprehensive plan and implementing land use ordinances and policies;

C. Schedule of improvements, initiation and completion;

D. Overall transportation and traffic pattern plan, including bicycle, pedestrian and public transit transportation facilities and access corridors;

E. Program timetable projection;

F. Development plans for any common elements or facilities;

G. If the proposed subdivision has an unknown impact upon adjacent lands or lands within the general vicinity, the Planning Director or Hearings Body may require a potential development pattern for streets, bikeways and access corridors for adjoining
lands to be submitted together with the tentative plan as part of the master development plan for the subject subdivision.

**Comment (1):** The Master Development Plan does not include a requirement for wildfire treatment in the wildfire hazard zone (see “Wildfire Hazard Overlay Zone” section, below). Fire Prevention and Control Plans address water supply, access, building ignition and fire-resistance factors, fire protection systems and equipment, defensible space, and vegetation management. Code language regarding a Fire Prevention and Control Plan can be found in Section 405 of the 2012 International Wildland-Urban Interface Code as well the City of Ashland’s Land Use Ordinance 18.3.10.100. The City of Ashland also requires provisions of the maintenance of the plan to be included in the development’s covenants, conditions, and restrictions or by the property owner. We recommend that the County consider the requirement of a Fire Prevention and Control Plan as exists in the City of Ashland (see Attachment 2).

**Comment (2):** As discussed in Comment 2 of code review Section 17.16.030, the County may want to consider including a provision in the Master Development Plan that requires areas at risk of wildfires to achieve specific NFPA 1141 and 1144 standards and/or achieve FireWise recognition.

**Section 17.36 Design Standards**

**17.36.260 Fire Hazards**

*Whenever possible, a minimum of two points of access to the subdivision or partition shall be provided to provide assured access for emergency vehicles and ease resident evacuation.*

**Comment:** The Deschutes County Code currently requires a minimum of two points of access to a subdivision in a fire hazard area. Model ordinances include additional standards for fire apparatus access in subdivisions. We recommend the County consider these higher standards to ensure adequate access in future subdivisions. NFPA 1141 code regulations suggests requiring three (3) points of access when there are greater than 600 households in a residential area. ICC suggests including additional requirements for a fire apparatus access road. Specific code language from the ICC Section 403.3 for Fire apparatus access roads states:

*When required, fire apparatus roads shall be all-weather roads with a minimum width of 20 feet and a clear height of 13 feet 6 inches; shall be designed to accommodate the loads and turning radii for fire apparatus normally used at that location within the jurisdiction. Dead-end roads in excess of 150 feet in length shall be provided with turnarounds as approved by the code official.*

**Comment on model ordinance:** The access standards presented in Section 403 of the ICC Wildland Urban Interface Code provide extensive guidance for providing access for emergency vehicles to subdivisions in the interface (see Attachment 3 for Section 403 in its entirety).
**Title 18: Zoning Ordinance**

This section reviews Title 18 in regards to land use and wildfire mitigation policies, and offers, for consideration of the Planning Commission, options for the County to improve current programs.

**Wildfire Hazard Overlay Zone**

Given the prevalence of wildfire risk within Deschutes County, applying transparent and effective standards to each individual base zone may not be the most effective means of regulating development. Several wildfire-affected counties in the country have adopted overlay zones to broadly identify lands potentially at risk for wildfire and require mitigation measures as part of the land planning and development process. By implementing an overlay district in Deschutes County, development standards for mitigating wildfire risk could be more easily interpreted and applied.

Wildfire Hazard Zones are currently depicted on the Deschutes County Wildfire Hazard Areas map, which is on file with the County Clerk (DCC 15.04.085):

A. *Wildfire Hazard Zones are those depicted on the Deschutes County Wildfire Hazard Areas map on file with the County Clerk.*

B. *Adoption of the Wildfire Hazard Areas map implements the provisions of the Wildfire Hazard Mitigation Section of the Oregon Residential Specialty Code enforced pursuant to DCC 15.04.010(A).*

These materials are currently only used in regards to building codes, but could support the implementation of an overlay zone to provide a broader approach to regulating land uses. Below is a sample of code language from Jefferson County, CO, which enables a Wildfire Hazard Overlay Zone:

*This District is intended to promote the public health, safety and welfare of the citizens of Jefferson County, minimize the risk of loss of life and property in Wildfire Hazard Overlay Zone District; encourage and regulate prudent land use in the Wildfire Hazard Overlay Zone District so as not to increase the danger to the public health, safety and property; reduce the demands for public expenditures for relief and protection of structures and facilities permitted in the Wildfire Hazard Overlay Zone District; regulate buildings and structures so as to minimize the hazard to public health, safety, welfare, and to public or private property.*

See Attachment 4 for the full text of Jefferson County’s Section 32: W-H Wildfire Hazard Overlay Zone.
18.36 Forest Use Zone F1 and 18.40 Forest Use Zone F2

18.36.040 Limitations on Conditional Use

18.36.040(B) The proposed use will not significantly increase fire hazard or significantly increase fire suppression costs or significantly increase risks to fire suppression personnel.

Comment: This section does not indicate how the increase in fire hazard, fire suppression costs, or risk to fire suppression personnel would be measured. We suggest the County consider including language stating the fire hazard risk would be determined by a wildland fire hazard assessment. Examples of this language and assessment can be found in NFPA 1144 Chapter 4 and the ICC International Wildland-Urban Interface Code Section 502. A sample of a Fire Hazard Severity Form can be found in the Attachment 5.

18.36.050 Standards for Single-Family Dwellings

This section contains standards for Single-Family Dwellings in Forest Use Zones.

18.36.050(A) General Provisions

Comment: To increase protection of life and property of single-family homes built in wildfire designated zones, we recommend the County include a provision for a Wildland Fire Hazard Mitigation Plan such as suggested in NFPA 1144 Chapter 4.3:

4.3.3: This plan shall include, but not limited to, the following:

1) Specific mitigation recommendations based on the hazard assessment to reduce the ignition potential around and including the structure

2) Construction modification or retrofit necessary to reduce the identified hazards as a minimum or to comply with the provisions in Chapter 5 (Building Design, Location, and Construction)

3) Fuel modification recommendations as specified in Chapter 6 (Fuel Modification Area)

4) A hazard mitigation implementation and maintenance schedule approved by the Authority having jurisdiction (AHJ).

Comment on model ordinance: The Wildland Fire Mitigation Plan would be preceded by a structure assessment as defined in Chapter 4 of NFPA 1144 that would assess the specific wildland fire hazards in the structure ignition zone.

Below is an example of code language with a Wildfire Mitigation Plan requirement in Boulder County, Colorado, Article 4-804.C.12:

A Wildfire Mitigation Plan demonstrating the appropriate site location of structures, construction design and the use of ignition resistant building material, defensible space
and fuel reduction around the structures, driveway access for emergency vehicles, and an emergency water supply for fire fighting.

18.36.070 Fire Siting Standards for Dwellings and Structures

18.36.070(C) Fire Siting Standards for Dwellings and Structures (also 18.40.70(C))

Caretaker residences and private accommodations for fishing shall not be located on hillsides steeper than 30% and containing flammable fuels. A single-family dwelling shall not be sited on a slope greater than 40%.

Comment: Wildfires spread more rapidly on steep slopes. The Deschutes County Code currently allows single-family homes to be sited on slopes as high as 40%, which places structures and lives at risk. Hillsides with hazardous topographic characteristics can be desirable residential areas due to their pleasant views, which could imply greater development pressure. We recommend the County consider lowering the maximum slope grade to 25% (the maximum allowable slope indicated in 18.113.070 Destination Resorts Zone) in order to prevent residential development from siting on more hazardous topographies. Alternatively or additionally, a conditional use could be implemented to require greater defensible space for homes built on slopes greater than 25%.

18.36.070(E) Structural Standards

1. All dwellings and structures shall use noncombustible or fire resistant roofing materials. This means roofing material identified as Class A, B or C in the Oregon Uniform Building Code. Roof sprinklers are not an acceptable alternative to this standard.

2. If the dwelling or structure has a chimney, it shall have a spark arrester.

Comment: See comment for 15.04.085 in regards to Class B roofing. We recommend the County consider specifically prohibiting shake roofing to prevent creating additional wildfire hazards.

18.36.080 Fire Safety Design Standards for Roads

The following standards apply to all roads and driveways, except for private roads accessing only commercial forest uses, which access uses permitted under DCC 18.36.020 or approved under DCC 18.36.030.

Comment: This section does not include language to address road identification signs or markers. Proper signage is important for emergency responders to quickly locate and identify a residence. We recommend the County consider including policies on road and address marking. The International Wildland-Urban Interface Code section 403.4 and 403.6 provide specific language addressing road and address marking:
**Section 403.4** Marking of roads: Approved signs or other approved notices shall be provided and maintained for access roads and driveways to identify such roads and prohibit the obstruction thereof or both.

**Section 403.6** Address Markers: All buildings shall have a permanently posted address, which shall be placed at each driveway entrance and be visible from both directions of travel along the road. In all cases, the address shall be posted at the beginning of construction and shall be maintained thereafter, and the address shall be visible and legible from the road on which the address is located.

### 18.60.070 Limitations on Conditional Use

The following limitations shall apply to uses allowed by DCC 18.60.030:

A. The Planning Director or Hearings Body may require establishment and maintenance of fire breaks, the use of fire resistant materials in construction and landscaping, or may attach other similar conditions or limitations that will serve to reduce fire hazards or prevent the spread of fire to surrounding areas.

B. The Planning Director or Hearings Body may limit changes in the natural grade of land, or the alteration, removal or destruction of natural vegetation in order to prevent or minimize erosion or pollution.

**Comment:** The language used in this section is too vague to effectively inform wildfire mitigation requirements. Though the Planning Director or Hearings Body currently may prescribe limitations to development on a case-by-case basis, wildfire mitigation in the rural residential zone could be made more robust by including specific standards. An example of such standards can be found in Deschutes County Code Section 18.36.070 (Fire Siting Standards for Dwellings and Structures in Forest Use Zones) and 18.36.080 (Fire Safety Design Standards for Roads in Forest Use Zones). We recommend the County consider including specific wildfire mitigation requirements to augment the authority held by the Planning Director or Hearings Body to ensure clear interpretations code language.

### 18.113 Destination Resorts

#### 18.113.060 Standards for Destination Resorts

The following standards shall govern consideration of destination resorts:

**Comment:** As described in comment 2 of code review Section 17.16.030, The County may want to consider including a provision for Destination Resorts that requires areas at risk of wildfires to achieve specific NFPA 1141 and 1144 standards and/ or achieve FireWise recognition.
18.124 Site Plan Review and 19.76 Site Plan Review

These section concerns site plan review requirements.

18.124.040(D) The site plan shall indicate the following:

1. Access to site from adjacent rights of way, streets and arterial.
2. Parking and circulation areas.
3. Location, dimensions (height and bulk) and design of buildings and signs.
4. Orientation of windows and doors.
5. Entrances and exits.
7. Pedestrian circulation.
8. Public play areas.
9. Service areas for uses such as mail delivery, trash disposal, above ground utilities, loading and delivery.
10. Areas to be landscaped.
11. Exterior lighting.
12. Special provisions for disabled persons.
13. Existing topography of the site at intervals appropriate to the site, but in no case having a contour interval greater than 10 feet.
15. Public improvements.
17. Bicycle parking facilities, with location of racks, signage, lighting, and showing the design of the shelter for long term parking facilities.
18. Any required bicycle commuter facilities.
19. Other site elements and information which will assist in the evaluation of site development.

Comment (1): Due to the frequency with which homes are being built in wildland areas of Deschutes County, requiring Wildfire Mitigation Plans may be a useful addition to the site plan review process. We recommend the County consider Including Wildfire Mitigation Plans as required contents for the site plan review process could minimize the loss of lives and property from wildfires. A sample Wildfire Mitigation Plan from Kane County, Utah is as follows:

A site plan, showing the location and extent of structures and other improvements, the defensible space management zones around the structures, the driveway access for emergency vehicles, emergency water supply for fire fighting, and the locations of other specific natural and human created features; and 2) a narrative that describes in detail these same features.

Another sample of code language from Boulder County Land Use Code Article 4-804.C.12

A Wildfire Mitigation Plan demonstrating the appropriate site location of structures, construction design and the use of ignition resistant building material, defensible space
and fuel reduction around the structures, driveway access for emergency vehicles, and an emergency water supply for fire fighting.

Comment (2): Deschutes County Code Section 19.76 Site Plan Review in the Bend Urban Growth Boundary differs from 18.124 mainly in its organization. A uniformed organization would make reading and comparing the two site review sections easier to follow.

ADDITIONAL INFORMATION

The following programs are non-regulatory options that the County can implement to provide additional resources and information for wildfire protection to homeowners. An incentive program is also identified to encourage wildfire mitigation activities.

Wildland Home Risk Meter

The Wildland Home Risk Meter provides a model for communities to identify their wildfire hazards risk in the urban interface by using a meter with multiple cardboard dials on a placard. The meter computes a wildfire hazard level using the following four steps:

1. Estimate the terrain slope around the home and line up the first dial.
2. Select the vegetation type rating from a given chart, and line up the rating on the second dial.
3. Select the roof material.
4. The wildfire risk meter then points to the danger rating from low to extreme.

Oregon Ready, Set, Go!

Oregon Ready, Set, Go is an online wildfire assessment tool that provides awareness and educational materials to property owners in Klamath County. The website allows property owners to enter their home address and identify structural and vegetative information to calculate a wildfire risk score. Based on the score, information will be provided to help reduce the home’s risk including building materials or outside landscaping. This is an educational tool for homeowners that can help protect their life and property as well as keep First Responders safe when fighting fires. To access the website visit: www.oregonrsg.org.

Incentive for Mitigation Activities: Ad Valorem Tax Exemption

Some jurisdictions have implemented ordinances that increase insurance rates in areas with extremely high wildfire risk. The policy rationale for this differential is that policyholders in areas of lower risk should not be expected to subsidize the insurance rates of policyholders in areas of higher risk. These ordinances then offer reduced rate incentives to policyholders that comply with guidelines designed to mitigate property loss from wildfire.

Some jurisdictions offer a one-time ad valorem tax exemption to land owners in wildfire hazard overlay districts. An example of enabling language is as follows:
Deschutes County shall grant a one-time ad valorem tax exemption to Landowners in the Overlay District. The exemption shall apply to all improvements to real property made by or for the purpose of wildfire mitigation and conducted in accordance with a Wildfire Mitigation Plan. The amount of the exemption shall be equal to the costs for improvements made by or for the use of wildfire mitigation and in accordance with the Wildfire Mitigation Plan. The exemption shall be assessed, one-time, against the Landowner’s ad valorem tax for the following year.

Comment: It should be noted, however, that the one-time assessment mentioned in this tax exemption may mislead property owners to believe that defensible space and wildfire mitigation are one-time activities.
ATTACHMENT I: RESOURCES

Boulder County, CO Land Use Code

Boulder County, CO faced several major wildfires in recent times, which destroyed hundreds of homes and acres of land. Wildfire mitigation measures were placed into land use code including the requirement for submission of a Wildland Mitigation Plan with a Site Plan application. Boulder County, CO experiences similar environmental conditions with Deschutes County including high summertime temperatures, seasonal high winds and increased human presence in development and recreational use. These conditions increase the risk for wildfire and need for mitigation measures such as a Wildfire Mitigation Plan.

City of Ashland, OR Land Use Code

The City of Ashland established a series of development standards for preliminary plats and applications to partition land containing designated wildfire areas. The development standards trigger preparation for a “fire prevention and control plan” that is reviewed by the fire chief as part of the record of action. This is a model standard that identifies a clear wildfire mitigation plan to be implemented prior to the issuance of a building permit and maintained in perpetuity.

Jefferson County Wildfire Hazard Overlay Zone

This zoning ordinance demonstrates several key elements that communities should include to safeguard against legal challenges in the implementation of an overlay zone: 1) A clear statement of the “intent and purpose” of the district. Note that the intent of the district is to “promote health, safety, and general welfare” and “to minimize the risk of loss of life and property in the Wildfire Hazard Overlay Zone District.” 2) A clear statement of applicability – property owners know if they are in or out of the hazard overlay district. 3) Performance standards that provide information to the property owner on what activities they can or must take to minimize risks of wildfire.


The Wildfire Technical Resource Guide provides information to help communities in Oregon plan for wildfire hazards. The guide is designed to help your local government address wildfire hazard issues through effective comprehensive plan inventories, policies, and implementing measures. This guide also contains numerous references and contacts for obtaining additional information about wildfire.

Wildfire Mitigation In Florida

A publication from the Florida Department of Community Affairs and Florida Department of Agriculture and Consumer Services, Division of Forestry, based on recommendations contained in published literature and recommended by advisory and review teams. The guide is a manual for communities at risk of wildland fire. Although it was produced for Florida, many of its recommendations are broad in nature.
ATTACHMENT 2: CITY OF ASHLAND FIRE PREVENTION AND CONTROL PLAN

18.3.10 – Physical and Environmental Constraints Overlay

exception is subject to the Type I procedure in section 18.5.1.050 and may be granted with respect to the development standards for Hillside Lands if the proposal meets all of the following criteria.

1. There is demonstrable difficulty in meeting the specific requirements of this chapter due to a unique or unusual aspect of the site or proposed use of the site.
2. The exception will result in equal or greater protection of the resources protected under this chapter.
3. The exception is consistent with the minimum necessary to alleviate the difficulty.
4. The exception is consistent with the stated Purpose and Intent of chapter 18.3.10 Physical and Environmental Constraints Overlay chapter and section 18.3.10.090 Development Standards for Hillside Lands.

18.3.10.100 Development Standards for Wildfire Lands

A. Requirements for Subdivisions, Performance Standards Development, or Partitions.

1. A Fire Prevention and Control Plan shall be required with the submission of any application for an outline plan approval of a Performance Standards Development, preliminary plat of a subdivision, or application to partition land where the site contains area designated as Wildfire Hazard.

2. The Staff Advisor shall forward the Fire Prevention and Control Plan to the Fire Chief within three days of the receipt of a completed application. The Fire Chief shall review the Fire Prevention and Control Plan, and submit a written report to the Staff Advisor no less than seven days before the scheduled hearing. The Fire Chief’s report shall be a part of the record of the Planning Action.

3. The Fire Prevention and Control Plan, prepared at the same scale as the development plans, shall include the following items:
   a. An analysis of the fire hazards on the site from wildfire, as influenced by existing vegetation and topography.
   b. A map showing the areas that are to be cleared of dead, dying, or severely diseased vegetation.
   c. A map of the areas that are to be thinned to reduce the interlocking canopy of trees.
   d. A tree management plan showing the location of all trees that are to be preserved and removed on each lot. In the case of heavily forested parcels, only trees scheduled for removal shall be shown.
   e. The areas of primary and secondary fuel breaks that are required to be installed around each structure, as required by 18.3.10.100.B.
   f. Roads and driveways sufficient for emergency vehicle access and fire suppression activities, including the slope of all roads and driveways within the Wildfire Lands area.

4. Approval Criteria; The hearing authority shall approve the Fire Prevention and Control Plan when, in addition to the findings required by this chapter, the additional finding is made that the
wildfire hazards present on the property have been reduced to a reasonable degree, balanced with the need to preserve and/or plant a sufficient number of trees and plants for erosion prevention, wildlife habitat, and aesthetics.

5. The hearing authority may require, through the imposition of conditions attached to the approval, the following requirements as deemed appropriate for the development of the property.
   a. Delineation of areas of heavy vegetation to be thinned and a formal plan for such thinning.
   b. Clearing of sufficient vegetation to reduce fuel load.
   c. Removal of all dead and dying trees.
   d. Relocation of structures and roads to reduce the risks of wildfire and improve the chances of successful fire suppression.

6. The Fire Prevention and Control Plan shall be implemented during the public improvements required of a subdivision or Performance Standards Development, and shall be considered part of the subdivider’s obligations for land development. The plan shall be implemented prior to the issuance of any building permit for structures to be located on lots created by partitions and for subdivisions or Performance Standards developments not requiring public improvements. The Fire Chief, or designee, shall inspect and approve the implementation of the Fire Prevention and Control Plan, and the Plan shall not be considered fully implemented until the Fire Chief has given written notice to the Staff Advisor that the plan was completed as approved by the hearing authority.

7. In subdivisions or Performance Standards Developments, provisions for the maintenance of the Fire Prevention and Control Plan shall be included in the covenants, conditions and restrictions for the development, and the City shall be named as a beneficiary of such covenants, restrictions, and conditions.

8. On lots created by partitions, the property owner shall be responsible for maintaining the property in accord with the requirements of the Fire Prevention and Control Plan approved by the hearing authority.

B. Requirements for Construction of All Structures.

1. **Applicability.** All new construction and any construction expanding the size of an existing structure shall have a fuel break as defined below.

2. **General Fuel Break Requirements.** A fuel break is defined as an area that is free of dead or dying vegetation, and has native, fast-burning species sufficiently thinned so that there is no interlocking canopy of this type of vegetation. Where necessary for erosion control or aesthetic purposes, the fuel break may be planted in slow-burning species. Establishment of a fuel break does not involve stripping the ground of all native vegetation. Fuel breaks may include structures, and shall not limit distance between structures and residences beyond that required by other sections of this ordinance.

3. **Primary Fuel Break.** A primary fuel break will be installed, maintained and shall extend a minimum of 30 feet, or to the property line, whichever is less, in all directions around structures, excluding fences, on the property. The goal within this area is to remove ground cover that will...
18.3.10 – Physical and Environmental Constraints Overlay

produce flame lengths in excess of one foot. Such a fuel break shall be increased by ten feet for each ten percent increase in slope over ten percent. Adjacent property owners are encouraged to cooperate on the development of primary fuel breaks.

4. **Secondary Fuel Break.** A secondary fuel break will be installed, maintained and shall extend a minimum of 100 feet beyond the primary fuel break where surrounding landscape is owned and under the control of the property owner during construction. The goal of the secondary fuel break is to reduce fuels so that the overall intensity of any wildfire is reduced through fuels control.

5. **Roofing.** All structures shall be constructed or re-roofed with Class B or better non-wood roof coverings, as determined by the Oregon Structural Specialty Code. All re-roofing of existing structures in the Wildfire Lands area for which at least 50 percent of the roofing area requires re-roofing shall be done under approval of a zoning permit. No structure shall be constructed or re-roofed with wooden shingles, shakes, wood-product material or other combustible roofing material, as defined in the City's building code.

C. Fuel breaks in areas which are also Erosive or Slope Failure Lands shall be included in the erosion control measures outlined in section 18.3.10.090 Development Standards for Hillside Lands.

D. **Implementation.**

1. For land that have been subdivided and required to comply with subsection 18.3.10.100.A.6, above, all requirements of the plan shall be complied with prior to the commencement of construction with combustible materials.

2. For all other structures, the vegetation control requirements of subsection 18.3.10.100.B, above, shall be complied with before the commencement of construction with combustible materials on the lot.

3. As of November 1, 1994, existing residences in subdivisions developed outside of the Wildfire Lands Zone, but later included due to amendments to the zone boundaries shall be exempt from the requirements of this zone, with the exception of subsection 18.3.10.100.B.5, above. All new residences shall comply with all standards for new construction in subsection 18.3.10.100.B.

4. Subdivisions developed outside of the wildfire lands zone prior to November 1, 1994, but later included as part of the zone boundary amendment, shall not be required to prepare or implement Fire Prevention and Control Plans outlined in subsection 18.3.10.100.A.

18.3.10.110 Development Standards for Severe Constraint Lands

A. **Severe Constraint Lands are extremely sensitive to development, grading, filling, or vegetation removal and, whenever possible, alternative development should be considered.**

B. Development of floodways is not permitted except for bridges and road crossings. Such crossings shall be designed to pass the 100-year flood without raising the upstream flood height more than six inches.

C. Development on lands greater than 35 percent slope shall meet all requirements of section
CHAPTER 4
WILDLAND-URBAN INTERFACE AREA REQUIREMENTS

SECTION 401
GENERAL

401.1 Scope. Wildland-urban interface areas shall be provided with emergency vehicle access and water supply in accordance with this chapter.

401.2 Objective. The objective of this chapter is to establish the minimum requirements for emergency vehicle access and water supply for buildings and structures located in the wildland-urban interface areas.

401.3 General safety precautions. General safety precautions shall be in accordance with this chapter. See also Appendix A.

SECTION 402
APPLICABILITY

402.1 Subdivisions. Subdivisions shall comply with Sections 402.1.1 and 402.1.2.

402.1.1 Access. New subdivisions, as determined by this jurisdiction, shall be provided with fire apparatus access roads in accordance with the International Fire Code and access requirements in accordance with Section 403.

402.1.2 Water supply. New subdivisions as determined by this jurisdiction shall be provided with water supply in accordance with Section 404.

402.2 Individual structures. Individual structures shall comply with Sections 402.2.1 and 402.2.2.

402.2.1 Access. Individual structures hereafter constructed or relocated into or within wildland-urban interface areas shall be provided with fire apparatus access in accordance with the International Fire Code and driveways in accordance with Section 403.2. Marking of fire protection equipment shall be provided in accordance with Section 403.5 and address markers shall be provided in accordance with Section 403.6.

402.2.2 Water supply. Individual structures hereafter constructed or relocated into or within wildland-urban interface areas shall be provided with a conforming water supply in accordance with Section 404.

Exceptions:
1. Structures constructed to meet the requirements for the class of ignition-resistant construction specified in Table 503.1 for a nonconforming water supply.
2. Buildings containing only private garages, carports, sheds and agricultural buildings with a floor area of not more than 600 square feet (56 m²).

402.3 Existing conditions. Existing buildings shall be provided with address markers in accordance with Section 403.6.

Existing roads and fire protection equipment shall be provided with markings in accordance with Sections 403.4 and 403.5, respectively.

SECTION 403
ACCESS

403.1 Restricted access. Where emergency vehicle access is restricted because of secured access roads or driveways or where immediate access is necessary for life-saving or firefighting purposes, the code official is authorized to require a key box to be installed in an accessible location. The key box shall be of a type approved by the code official and shall contain keys to gain necessary access as required by the code official.

403.2 Driveways. Driveways shall be provided when any portion of an exterior wall of the first story of a building is located more than 150 feet (45 720 mm) from a fire apparatus access road.

403.2.1 Dimensions. Driveways shall provide a minimum unobstructed width of 12 feet (3658 mm) and a minimum unobstructed height of 13 feet 6 inches (4115 mm).

403.2.2 Length. Driveways in excess of 150 feet (45 720 mm) in length shall be provided with turnarounds. Driveways in excess of 200 feet (60 960 mm) in length and less than 20 feet (6096 mm) in width shall be provided with turnouts in addition to turnarounds.

403.2.3 Service limitations. A driveway shall not serve in excess of five dwelling units.

Exceptions: When such driveways meet the requirements for fire apparatus access road in accordance with Section 503 of the International Fire Code.

403.2.4 Turnarounds. Driveway turnarounds shall have inside turning radii of not less than 30 feet (9144 mm) and outside turning radii of not less than 45 feet (13 716 mm). Driveways that connect with a road or roads at more than one point shall be considered as having a turnaround if all changes of direction meet the radius requirements for driveway turnarounds.

403.2.5 Turnouts. Driveway turnouts shall be an all-weather road surface at least 10 feet (3048 mm) wide and 30 feet (9144 mm) long. Driveway turnouts shall be located as required by the code official.

403.2.6 Bridges. Vehicle load limits shall be posted at both entrances to bridges on driveways and private roads. Design loads for bridges shall be established by the code official.

403.3 Fire apparatus access road. When required, fire apparatus access roads shall be all-weather roads with a minimum width of 20 feet (6096 mm) and a clear height of 13 feet 6 inches (4115 mm); shall be designed to accommodate the
WILDLAND-URBAN INTERFACE AREA REQUIREMENTS

loads and turning radii for fire apparatus; and shall have a gradient negotiable by the specific fire apparatus normally used at that location within the jurisdiction. Dead-end roads in excess of 150 feet (45 720 mm) in length shall be provided with turnarounds approved by the code official. An all-weather road surface shall be any surface material acceptable to the code official that would normally allow the passage of emergency service vehicles typically used to respond to that location within the jurisdiction.

403.4 Marking of roads. Approved signs or other approved notices shall be provided and maintained for access roads and driveways to identify such roads and prohibit the obstruction thereof or both.

403.4.1 Sign construction. All road identification signs and supports shall be of noncombustible materials. Signs shall have minimum 4-inch-high (102 mm) reflective letters with $\frac{1}{2}$ inch (12.7 mm) stroke on a contrasting 6-inch-high (152 mm) sign. Road identification signage shall be mounted at a height of 7 feet (2134 mm) from the road surface to the bottom of the sign.

403.5 Marking of fire protection equipment. Fire protection equipment and fire hydrants shall be clearly identified in a manner approved by the code official to prevent obstruction.

403.6 Address markers. All buildings shall have a permanently posted address, which shall be placed at each driveway entrance and be visible from both directions of travel along the road. In all cases, the address shall be posted at the beginning of construction and shall be maintained thereafter, and the address shall be visible and legible from the road on which the address is located.

403.6.1 Signs along one-way roads. Address signs along one-way roads shall be visible from both the intended direction of travel and the opposite direction.

403.6.2 Multiple addresses. Where multiple addresses are required at a single driveway, they shall be mounted on a single post, and additional signs shall be posted at locations where driveways divide.

403.6.3 Single business sites. Where a roadway provides access solely to a single commercial or industrial business, the address sign shall be placed at the nearest road intersection providing access to that site.

403.7 Grade. The gradient for fire apparatus access roads and driveways shall not exceed the maximum approved by the code official.

SECTION 404
WATER SUPPLY

404.1 General. When provided in order to qualify as a conforming water supply for the purpose of Table 403.1 or as required for new subdivisions in accordance with Section 402.1.2, an approved water source shall have an adequate water supply for the use of the fire protection service to protect buildings and structures from exterior fire sources or to suppress structure fires within the wildland-urban interface area of the jurisdiction in accordance with this section.

Exception: Buildings containing only private garages, carports, sheds and agricultural buildings with a floor area of not more than 600 square feet (56 m²).

404.2 Water sources. The point at which a water source is available for use shall be located not more than 1000 feet (305 m) from the building and be approved by the code official. The distance shall be measured along an unobstructed line of travel.

Water sources shall comply with the following:

1. Man-made water sources shall have a minimum usable water volume as determined by the adequate water supply needs in accordance with Section 404.5. This water source shall be equipped with an approved hydrant. The water level of the water source shall be maintained by rainfall, water pumped from a well, water hauled by a tanker or by seasonal high water of a stream or river. The design, construction, location, water level maintenance, access and access maintenance of man-made water sources shall be approved by the code official.

2. Natural water sources shall have a minimum annual water level or flow sufficient to meet the adequate water supply needs in accordance with Section 404.5. This water level or flow shall not be rendered unusable because of freezing. This water source shall have an approved draft site with an approved hydrant. Adequate water flow and rights for access to the water source shall be ensured in a form acceptable to the code official.

404.3 Draft sites. Approved draft sites shall be provided at all natural water sources intended for use as fire protection for compliance with this code. The design, construction, location, access and access maintenance of draft sites shall be approved by the code official.

404.3.1 Access. The draft site shall have emergency vehicle access from an access road in accordance with Section 402.

404.3.2 Pumper access points. The pumper access point shall be either an emergency vehicle access area alongside a conforming access road or an approved driveway no longer than 150 feet (45 720 mm). Pumper access points and access driveways shall be designed and constructed in accordance with all codes and ordinances enforced by this jurisdiction. Pumper access points shall not require the pumper apparatus to obstruct a road or driveway.

404.4 Hydrants. All hydrants shall be designed and constructed in accordance with nationally recognized standards. The location and access shall be approved by the code official.
ATTACHMENT 4: JEFFERSON COUNTY, CO WILDFIRE HAZARD OVERLAY ZONE

Section 32: W-H Wildfire Hazard Overlay District

(orig. 1-27-76; am. 2-1-85; am. 7-15-87; am. 12-17-92; am. 7-11-93; am. 6-20-10)

A. Intent and Purpose Of District

This District is intended to promote the public health, safety and welfare of the citizens of Jefferson County, minimize the risk of loss of life and property in Wildfire Hazard Overlay Zone District; encourage and regulate prudent land use in the Wildfire Hazard Overlay Zone District so as not to increase the danger to the public health, safety and property; reduce the demands for public expenditures for relief and protection of structures and facilities permitted in the Wildfire Hazard Overlay Zone District; regulate buildings and structures so as to minimize the hazard to public health, safety, welfare, and to public or private property. (orig. 1-27-76; am. 12-17-92)

B. General Provisions

1. Boundaries

The boundaries of the Wildfire Hazard Overlay Zone District shall be as they appear on the official recorded Wildfire Hazard Overlay Zone District Map as adopted by the Board of County Commissioners and kept on file with the Planning and Zoning Department. The boundary lines on the map shall be determined by the scale appearing on the map. Where there is a conflict between the boundary lines illustrated on the map and the actual field conditions, the conflict shall be settled according to the "Mapping Conflicts" portion of this Section. (orig. 1-27-76; am. 12-15-96)

2. Wildfire Hazard District Overlays Other Zone Districts

The Wildfire Hazard District shall overlay any portion of other underlying zone districts, including Planned Development Zone Districts, which is applicable to the Wildfire Hazard Overlay Zone District. The regulations of this District shall be construed as being supplementary to the regulations imposed on the same lands by any underlying zone district. When the regulations of this district conflict with any provision of the underlying zone district, the provisions of this overlay district shall control. Any underlying zone district shall remain in full force and effect to the extent that its provisions do not conflict with the provisions of this District. (orig. 1-27-76)

3. Warning and Disclaimer of Liability

The degree of protection from potential wildfire hazards intended to be provided by this regulation is considered reasonable for regulatory purposes, and is based on current forestry and wildfire mitigation research. This regulation is intended to reduce the risks, costs, and impacts from wildfire. Nonetheless, wildfire is capricious and unpredictable. Thus damage may occur to persons and property although structures and land uses may be properly permitted within the provisions of the Wildfire Hazard Overlay District. (orig. 1-27-76; am. 12-15-96)

C. Use Regulation

All use shall be permitted within the Wildfire Hazard Overlay District to the same extent that they are permitted by an underlying zone district, so long as the same are not in conflict with any of the provisions set forth herein. (orig. 1-27-76; am. 12-15-96)

D. Building Permits

1. No Building Permit may be issued for a new dwelling, the replacement of an existing dwelling, or for additional space of 400 square feet or more (cumulatively measured), from May 21, 2002, the date of this regulation's adoption, until written evidence has been submitted and approved by the Zoning Administrator or his/her appointed designee stating that the following have been satisfied: (orig. 12-5-96; am. 6-18-02; am. 12-17-02)
a. Defensible space and associated fuel break thinnings have been created around the dwelling, or a wildfire mitigation site plan has been reviewed and a special exception granted by the Board of Adjustment for the property for which a Building Permit has been requested. (orig. 12-5-95)

b. Access standards as specified in the General Provisions and Regulations Section of this Zoning Resolution have been satisfied. (orig. 12-5-95; am. 7-11-06)

2. Where the property owner chooses to submit a wildfire mitigation site plan for review by the Board of Adjustment, a Building Permit shall not be issued until such time as the wildfire mitigation site plan has been reviewed and a Special Exception granted by the Board of Adjustment. (orig. 12-5-95)

3. Design Standards
   a. The standards and criteria governing the design of defensible space and associated fuel break thinnings shall be contained in the Colorado State University’s Cooperative Extension Fact Sheet 6.302 and will be administered, with flexibility, by a qualified wildfire interface fire specialist from a current list provided by Jefferson County Planning and Zoning. (orig. 12-5-95; am. 6-16-02)
   b. The standards and criteria contained in the Roadway Design and Construction Manual shall govern the design and construction of all roadways in this overlay district, including private roads and driveways. (orig. 12-5-95; am. 12-17-02)

4. Defensible Space Certification Procedures
   a. An applicant who has obtained a Defensible Space permit shall be deemed to be in compliance with the initial defensible space review when an initial inspection has been completed by entities deemed qualified by the Zoning Administrator or his/her appointed designee to conduct such inspections. Upon receipt of the initial inspection, the Planning and Zoning Department may issue the Building Permit. A final inspection shall be completed by entities deemed qualified before a Certificate of Occupancy can be issued for the newly created structure or addition. The cost of inspection and certification shall be borne entirely by the Building Permit applicant. (orig. 12-5-95; am. 6-16-02; am. 12-17-02)
   b. A denial of a certificate of completion may be appealed to the Board of Adjustment. The written appeal must be received by the secretary of the Board of Adjustment within 30 calendar days of the date of denial. (orig. 12-5-95; am. 12-17-02)

E. Mapping Conflicts

In all cases, a person contesting the location of the Wildfire Hazard Overlay District boundary or the severity of conditions at a specific location within the Wildfire Hazard Overlay District shall be given a reasonable opportunity to present their case to the Zoning Administrator or his/her appointed designee, and shall submit forestry and topographic evidence to support such contentions. The Zoning Administrator or his/her appointed designee shall not allow deviations from the boundary line as mapped or change the mitigation requirements recommended by the Colorado State Forest Service and Jefferson County Emergency Management unless the forestry and other related technical evidence clearly and conclusively establish that the mapped location of the boundary line is incorrect or that the hazard conditions as determined by the Colorado State Forest Service or Jefferson County Emergency Management are in error. The Zoning Administrator or his/her appointed designee must make a finding that any deviations approved as a result of this subsection do not present a significant hazard to public health, safety or to property at the specific contested location within the Wildfire Hazard Overlay Zone District. (orig. 12-5-95; am. 12-17-02)

F. Qualifications

The following criteria have been established as meeting the alternative qualifications for the defensible space program. A person with these qualifications shall be termed a wildfire interface fire specialist.
certification letter must be submitted by the applicant prior to the issuance of a Building Permit in order to be in compliance with the provisions of this Section. (orig. 6-18-02)

1. Minimum Qualifications (orig. 6-18-02)

   Bachelor's degree in Forestry or a closely related field and two years wildland/urban interface firefighting experience, or successful completion of the following National Wildfire Coordinating Group Classes. (orig. 6-18-02)

   S-130 Basic Wildland Firefighting

   S-190 Basic Fire Behavior

   S-215 Fire Operations in the Wildland/Urban Interface

   S-290 Intermediate Wildland Fire Behavior

   S-300 Introduction to Wildfire Behavior Calculations

   National Fire Protection Association (NFPA) workshop “assessing wildfire hazards in the home ignition zone” (or equivalent) and five years wildland/urban interface firefighting. (orig. 6-18-02)

2. The applicant must submit a letter from a qualified Wildfire Interface Fire Specialist, certifying that the defensible space work undertaken on the property meets the standards and criteria governing the design of defensible space and associated fuel break thinning as described in the Colorado State University’s Cooperative Extension Fact Sheet 6.302. (orig. 6-18-02)

G. Maintenance Of Defensible Space and Associated Fuel Break Thinning

Defensible space and fuel break thinning work must be completed and maintained to the standards described in the Colorado State University’s Cooperative Extension Fact Sheet 6.302. The responsibility for maintaining defensible space and associated fuel break thinning lies with the landowner. Noncompliance with defensible space maintenance standards will be enforced as a Zoning Violation, as specified in the Enforcement and Administrative Exceptions Section of this Zoning Resolution. (orig. 6-18-02, am. 7-11-06)
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**ATTACHMENT 5: ICC FIRE HAZARD SEVERITY FORM**

**APPENDIX C**

**FIRE HAZARD SEVERITY FORM**

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

When adopted, this appendix is to be used in place of Table 502.1 to determine the fire hazard severity.

### A. Subdivision Design Points

<table>
<thead>
<tr>
<th>1. Ingress/Egress</th>
<th>Topography</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two or more primary roads</td>
<td>8% or less</td>
</tr>
<tr>
<td>One road</td>
<td>20% or more, but less than 30%</td>
</tr>
<tr>
<td>One-way road in, one-way road out</td>
<td>30% or more</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2. Width of Primary Road</th>
<th>Roofing Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 feet or more</td>
<td>Class A Fire Rated</td>
</tr>
<tr>
<td>Less than 20 feet</td>
<td>Class B Fire Rated</td>
</tr>
</tbody>
</table>

| 3. Accessibility | Class C Fire Rated | 10 |
|------------------|------------------|
| Road grade 5% or less | Nonrated | 20 |
| Road grade more than 5% | | |

<table>
<thead>
<tr>
<th>4. Secondary Road Terminus</th>
<th>Fire Protection—Water Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loop roads, cul-de-sacs with an outside turning radius of 45 feet or greater</td>
<td>500 GPM hydrant within 1,000 feet</td>
</tr>
<tr>
<td>Cul-de-sac turnaround</td>
<td>Hydrant farther than 1,000 feet or draft site</td>
</tr>
<tr>
<td>Dead-end roads 200 feet or less in length</td>
<td>Water source 20 min. or less, round trip</td>
</tr>
<tr>
<td>Dead-end roads greater than 200 feet in length</td>
<td>Water source farther than 20 min., and 45 min. or less, round trip</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5. Street Signs</th>
<th>Existing Building Construction Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Present</td>
<td>Noncombustible siding/deck</td>
</tr>
<tr>
<td>Not present</td>
<td>Noncombustible siding/combustible deck</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>6. Vegetation (IWUIC Definitions)</th>
<th>Utilities (gas and/or electric)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Fuel Types</td>
<td>All underground utilities</td>
</tr>
<tr>
<td>Light</td>
<td>One underground, one aboveground</td>
</tr>
<tr>
<td>Medium</td>
<td>All aboveground</td>
</tr>
<tr>
<td>Heavy</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2. Defensible Space</th>
<th>Total for Subdivision</th>
</tr>
</thead>
<tbody>
<tr>
<td>70% or more of site</td>
<td>Moderate Hazard</td>
</tr>
<tr>
<td>30% or more, but less than 70% of site</td>
<td>High Hazard</td>
</tr>
<tr>
<td>Less than 30% of site</td>
<td>Extreme Hazard</td>
</tr>
</tbody>
</table>

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*2012 INTERNATIONAL WILDLAND-URBAN INTERFACE CODE®*
March 27, 2015

To          | Deschutes County Planning Commission
From        | Drew Pfefferle, Mike Howard, Bob Parker, and the CPW Team
SUBJECT     | Deschutes County Code Review: Flood Program

INTRODUCTION

The Community Planning Workshop (CPW) is working with the Deschutes County Community Development Department (CDD) to review sections of the Deschutes County Development Code consistent with direction provided in Comprehensive Plan Section 3.5 (Rural Growth/Natural Hazards). The review will focus on improving development regulations that address wildfire, flood, and other natural hazards.

Task 4 of our work program requires CPW to facilitate work sessions with the Planning Commission and the Board of County Commissioners (BOCC) to present policy and programmatic options for further analysis and review. CPW will hold work sessions with the Planning Commission on April 9 (flood) and April 23 (wildfire). Following these work sessions CPW will hold a work session with the BOCC on May 18. This memorandum provides an overview of the project and presents research findings to the Planning Commission in regards to floodplain management for the April 9th work session. This work session has three objectives: 1) Identify the current flood risks in Deschutes County, 2) Review the county’s existing flood program, and 3) Present for discussion potential policy options in regards to floodplain management.

BACKGROUND

Deschutes County updated the Natural Hazards element of its Comprehensive Plan in 2011. Section 3.5 of the Deschutes County Comprehensive Plan establishes County policy with respect to natural hazards. The comprehensive plan cross-references the Natural Hazards Mitigation Plan (NHMP) as well as Deschutes County Community Wildfire Protection Plans (CWPPs). Policy 3.5.1 specifically addresses maintenance of the Goal 7 Comprehensive Plan Element as well as the NHMP and CWPP:

Adopt by reference the most recent Deschutes County Natural Hazards Mitigation Plan into this Plan.

a) Review and evaluate this Section of the Comprehensive Plan every five years.

b) Adopt by reference Community Wildfire Protection Plans and revisions into this Plan.
In summary, Policy 3.5.1 clearly articulates the County’s commitment to address natural hazards and establishes mechanisms for coordinating the Comprehensive Plan with the NHMP and CWPPs. Furthermore, this project assists Deschutes County with a review and analysis of Comprehensive Plan Section 3.5 to ensure consistency with the NHMP Update and the following policies:

Policy 3.5.4 Provide Incentives and if needed regulations, to manage development in areas prone to natural hazards.

Policy 3.5.11 Review and revise County Code as needed to:

a. Ensure that land use activities do not aggravate, accelerate or increase the level of risk from natural hazards.

b. Address wildfire concerns to and from development, through consideration of site location, building construction and design, landscaping, defensible space, fuel management, access and water availability.

c. Require development proposals to include an impact evaluation that reviews the ability of the affected fire agency to maintain an appropriate level of service to existing development and the proposed development.

d. Minimize erosion from development and ensure disturbed or exposed areas are promptly restored to a stable, natural and/or vegetated condition using natural materials or native plants.

e. Endure drainage from development or alterations to historic drainage patterns do not increase erosion on-site or on adjacent properties.

f. Make the Floodplain Zone a combining zone and explore ways to minimize and mitigate floodplain impacts.

g. Require new subdivisions and destination resorts to achieve FireWise standards from the beginning of the projects and maintain those standards in perpetuity.

Specifically, this project is a review of the Deschutes County Development Code consistent with guidance provided in policies 3.5.4 and 3.5.11 of the Deschutes County Comprehensive Plan. The focus of this project is to identify policy and programmatic options for consideration by the Board of County Commissioners (BOCC), Planning Commission, staff, stakeholders, and partner organizations. The options will be structured in a manner that staff can include them in future annual CDD work programs. CDD staff will work with county decision makers to identify policy and code language for potential adoption into the comprehensive plan or development code.
**Flood Risk in Deschutes County**

The geological makeup of Deschutes County makes it less susceptible to flooding than surrounding counties. Due to underlying porous volcanic rocks that have a large capacity for water storage, flooding has not been a serious problem in Deschutes County. However, historically a few significant flooding events have affected the county. The flood of record on the Deschutes River occurred in November 1909 downstream of the Little Deschutes River at the gauge near Benham Falls, with a discharge of 5,000 cubic feet per second (cfs). In December 1964, at the same location, there was a discharge of 3,470 cfs, which was approximately a 175-year flood.

The principal sources of flooding occur from the Deschutes River, Little Deschutes River, Whychus Creek, Paulina Creek, and Spring River. These locations can potentially threaten the communities of Bend, La Pine, Sisters, and Tumalo. The annual flood season for these regions occurs approximately between October through July.

Flooding mainly occurs from prolonged warm rain on snow (winter), snowmelt flooding (spring), or frazil ice and ice jams near Mirror Pond (Bend). There is a potential flood hazard due to a moraine dam at Carver Lake near the Three Sisters and Broken Top that could fail due to seismic activity, avalanches of rock and ice, or the unstable nature of the dam material.

Deschutes County has assessed the probability of a flood event to be high (at least one flood event within the next 10 to 35 years) and the vulnerability to the population and property to be low (less than 1% of population and property expected to be affected by any one event).

**Development Location and Rate of Development**

Between 2000 and 2013 population in Deschutes County increased 40.9%. According to Deschutes County’s population forecast between 2013 and 2025, the county’s population is anticipated to grow by 48.2% (78,286 people). The City of Bend is expected to account for 40% of the population growth, while the rural (non-incorporated) areas of the county are expected to account for 33% of the population growth.

Since 2005, the County approved approximately 50 land use permits for some type of development in the 100-year floodplain, approximately 20 of which were conditional use permits that allowed for development of new residential structures in the floodplain. Most approved conditional use permits were located between La Pine and Sunriver, along the Deschutes River (at least two CUPs were for development on the Whychus near Sisters).

**Model Ordinances**

CPW used the following federal and state model ordinances in the process of reviewing the county’s development code:

guidance on ways to improve floodplain management practices while assisting communities to meet the requirements of the Endangered Species Act within FEMA Region 10.

**Oregon Model Flood Damage Prevention Ordinance (2014, modified March 2015, Oregon Model Floodplain Ordinance):** The model ordinance includes required, and recommended, standards and provisions that ensure sound floodplain management practices to comply with the National Flood Insurance Program (NFIP) in the state of Oregon.

**Existing County Flood Management Programs**

Deschutes County currently participates in the National Flood Insurance Program (NFIP). The NFIP offers affordable flood insurance to property owners in communities that adopt and enforce floodplain management regulations set by FEMA. Homeowners with federally backed mortgages located in the floodplain zone are required to purchase flood insurance. Flood Insurance Rate Maps (FIRM) are the official maps on which both the special flood hazard area (the area where the NFIP floodplain management regulations must be enforced and where mandatory purchase of flood insurance applies) and the risk premium zones for a community have been delineated. Deschutes County’s current FIRMs were digitally updated in 2007. In 2012, based upon data from the U.S. Census, the Federal Insurance and Mitigation Administration (FIMA), a division of FEMA, reported that approximately 15% of Deschutes households eligible for the NFIP had policies in force. Deschutes County maintains its participation in the NFIP with ongoing compliance of the program’s minimum flood mitigation standards by adopting and enforcing the following NFIP regulations (FEMA, NFIP Guidebook, p. 21):

- **Require development permits for all proposed construction and other developments within the community’s designated 100-year floodplain.**
- **Ensure all other permits required by local, State and Federal laws are obtained.**
- **Maintain records of all development permits.**
- **Review the permit to ensure that sites are reasonably safe from flooding.**
- **Review subdivision proposals to determine whether the project is safe from flooding and provides for adequate drainage.**
- **Require residential structures to have the lowest floor (including basement) elevated at least to or above the Base Flood Elevation (BFE).**
- **Require non-residential structures to have the first floor elevated or floodproofed one foot above the BFE.**
- **Require manufactured homes be elevated and anchored.**
- **Require water supply systems be designed to eliminate infiltration of floodwaters.**
• Require new and replacement sanitary sewage systems be designed to minimize or eliminate infiltration of flood waters.

• Ensure flood carrying capacity of altered or relocated watercourses is maintained.

• Verify/document lowest floor elevations of new or substantially improved structures.

• Determine whether structures in the Special Flood Hazard Area have been substantially damaged. If a substantial damage determination is made, the repairs must include bringing the structure up to current flood hazard area building standards.

**Review of County Comprehensive Plan Policies**

This section presents a review of the Deschutes County Comprehensive Plan in regards to land use and flood hazard mitigation policies and programs. The existing comprehensive plan policy language is shown in *italics* followed by our comments. Model development code language is shown in *italics and underlined*.

**Comprehensive Plan Policy 3.5.10:**

*Regulate development in designated floodplains identified on the Deschutes County Zoning Map based on Federal Emergency Management Act regulations.*

*a. Participate in and implement the Community Rating System as part of the National Flood Insurance Program.*

**Comment:** Community Rating System (CRS) standards go beyond the minimum requirements of the NFIP. Adoption of CRS strengthens and supports the insurance aspects of the NFIP and encourages a comprehensive approach to floodplain management. According to CDD staff, “based on coordination with Department of Land Conservation (DLCD), staff believes that the above-and-beyond programs of the Community Rating System (CRS) would present a low return on investment of staff time and resources. This could change if there were significantly increased participation by county residents in flood insurance (increasing the value of reduced insurance rates) or if basic CRS activities were pre-packaged for easy deployment by DLCD (reducing their cost).” Although participation in the CRS is not deemed feasible at this time, the following higher standards of the CRS are worth consideration.

The following CRS higher standards are worth considering to enhance public safety, reduce damages to property and public infrastructure, avoid economic disruption and losses, reduce human suffering, and protect the environment:

• **432.e Lower Substantial Improvements Threshold:** The NFIP (and the Deschutes Code) allows improvements valued at up to 50% of the building’s pre-improvement value to be permitted without meeting the flood protection requirements for buildings located in
the special flood hazard area. Following are ways to lower the substantial improvements threshold:

- Instead of basing the substantial improvement determination on the value of the building and the cost of the project, a higher standard is to limit expansions of the building to no more than 25% of the square footage of the lowest floor.
- Another higher standard is to apply the threshold to either improvements or to repairs to damaged buildings, but not both.

- **432.d Cumulative Substantial Improvements:** The NFIP (and the Deschutes Code) allows improvements valued at up to 50% of the building’s pre-improvement value to be permitted without meeting the flood protection requirements for buildings located in the special flood hazard area. Over the years, a community may issue a succession of permits for different repairs or improvements to the same structure. This can greatly increase the overall flood damage potential to that building as well as the insurance liability to FEMA. Cumulative substantial improvement ensures that the total value of all improvements or repairs permitted over time does not exceed 50% of the value of the structure. When the total value does exceed 50%, the original building must be protected according to the ordinance requirements for new construction.

- **431.a Prohibiting Fill:** Prohibiting fill and other ground-altering measures within the special flood hazard area can protect existing development and habitat, improve water quality, and maintain the flood attenuating benefits of natural areas.

- **431.a Protecting Critical Facilities:** Protecting critical facilities to higher levels reduces damage to those facilities and improves the community’s ability to respond to the needs of citizens during a disaster. Critical facilities are facilities for which even a slight chance of flooding might be too great (including, but not limited to, schools, nursing homes, hospitals, police, fire, and emergency response installations, and installations which produce, use, or store hazardous materials or waste). The highest standard is to prohibit development of these facilities within the special flood hazard area. In special cases, it may not be feasible to locate critical facilities outside the special flood hazard area, in these cases regulations that allow new facilities in the special flood hazard area, but set higher protection standards for them could be considered. The standards may apply to some facilities, or some parts of facilities, for example, regulations may address only one type of critical facility, such as hazardous materials sites or critical facilities owned and managed by the community.

- **432.a.(3) Development Limitations:** Prohibition of outdoor storage of materials (currently the Deschutes Code allows storage of some materials with a CUP per 18.96.040(B):

  (a) Prohibition outdoor storage of all materials in the SFHA.
(b) Prohibition of hazardous materials (indoors or outdoors) in the SFHA.

(c) Storage of hazardous materials allowed to be stored indoors in the special flood hazard area, but elevated above the base flood elevation.

**Comprehensive Plan Policy 3.5.11(f):**

*Review and revise County Code as needed to:*

*f. Make the Floodplain Zone a combining zone and explore ways to minimize and mitigate floodplain impacts.*

**Comment:** The Floodplain Zone (18.96) is currently a base zone, meaning that it has its own list of allowed uses, restrictions, and special provisions, like the Rural Residential Zone (RR-10) or Exclusive Farm Use Zone (EFU). Having the Floodplain Zone as a base zone presents a number of difficulties:

- Many properties have some Floodplain Zoning near the river with the majority of the property in a different zone. This “split-zoning” presents a number of code interpretation challenges.

- FEMA and the County Code (under DCC 18.96.130) allow a landowner to provide a topographical survey to show that a property or portion of a property is above the area of special flood hazard.

One option for consideration is conversion of the Floodplain Zone to a combining zone. Like the Wildlife Area (WA) Combining Zone, a Floodplain Combining Zone would first assign every property a base zone appropriate to the neighborhood (e.g. RR-10, EFU, etc.) and, second, restrict and condition development that is actually subject to flood hazard in accordance with FEMA regulations.

In addition, Deschutes County Code has three sections that include floodplain regulations (two of which are combining districts): Chapter 18.96 County Zoning, Flood Plain Zone, Chapter 18.108 County Zoning, Urban Unincorporated Community Zone – Sunriver (in particular 18.108.190 Flood Plain Combining District), and Chapter 19.72 Bend Urban Growth Boundary Zoning Ordinance, Flood Plain Combining Zone. An option for consideration by the Planning Commission is to repeal the existing floodplain zones (18.96 and 18.108.190) and create one Floodplain Combining Zone for Title 18 County Zoning and one for Title 19 Bend Urban Growth Boundary.

**Review of County Development Code**

This section presents a review of the County’s current development code in regards to land use and flood mitigation policies and programs and identifies potential actions to strengthen current codes. In the following section the existing development code language is shown in *italics* followed by our comments. Model development code is shown in *italics and underlined.*
Title 18: County Zoning

This section reviews Title 18 in regards to land use and flood mitigation policies programs and identifies options for the county to strengthen current language.

Chapter 18.04 Definitions

There are several definitions provided in the Oregon Model Floodplain Ordinance that the Planning Commission may choose to consider adding to the Code, including:

“Below-grade Crawl Space” means an enclosed area below the base flood elevation in which the interior grade is not more than two feet below the lowest adjacent exterior grade and the height, measured from the interior grade of the crawlspace to the top of the crawlspace foundation, does not exceed 4 feet at any point.

Note: See comment under 18.96.080(D)(4) for more information regarding below-grade crawl spaces.

“Conditional Letter of Map Revision (CLOMR)” means a letter from FEMA commenting on whether a proposed project, if built as proposed, would meet the minimum NFIP standards or proposed hydrology changes.

“Critical Facility” means a facility for which even a slight chance of flooding might be too great. Critical facilities include, but are not limited to schools, nursing homes, hospitals police, fire and emergency response installations, installations which produce, use or store hazardous materials or hazardous waste.

“Elevated Building” means for insurance purposes, a nonbasement building which has its lowest elevated floor raised above ground level by foundation walls, shear walls, post, piers, pilings, or columns.

“Substantial Damage” means damage of any origin sustained by a structure whereby the cost of restoring the structure to its before damaged condition would equal or exceed 50 percent of the market value of the structure before the damage occurred.

Chapter 18.96 Flood Plain Zone

18.96.010: Purposes

The purposes of the Flood Plain Zone are: To implement the Comprehensive Plan Flooding Section; to protect the public from the hazards associated with flood plains; to conserve important riparian areas along rivers and streams for the maintenance of the fish and wildlife resources; and to preserve significant scenic and natural resources while balancing the public interests with those of individual property owners in the designated areas.

Comment: The Deschutes County Code does a good job of addressing environmental impacts, but only has a broad scope of addressing human health. There is also no focus on the financial
impact of flooding, from money for flood control projects to economic impacts on business interruptions. One option is to expand the purpose statement of the floodplain ordinance with the possibility of outlining a list that details each purpose. The following is an example of code language from the Oregon Model Floodplain Ordinance:

Section 1.3 Statement of Purpose:

(1) To protect human life and health;

(2) To minimize expenditure of public money and costly flood control projects;

(3) To minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;

(4) To minimize prolonged business interruptions;

(5) To minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets, and bridges located in areas of special flood hazard;

(6) To help maintain a stable tax base by providing for the sound use and development of areas of special flood hazard so as to minimize future flood blight areas;

(7) To ensure that potential buyers are notified that property is in an area of special flood hazard; and,

(8) To ensure that those who occupy the areas of special flood hazard assume responsibility for their actions.

18.96.020 Designated Areas.

The designation of the local floodplain administrator and their duties and responsibilities are covered in 18.96.020 and 18.96.070. The duties, however, could be more explicit and ensure that the elevation certificate, base flood elevation, and substantial damage requirements of the NFIP are explicitly referenced. The Oregon Model Floodplain Ordinance provides an example of more comprehensive duties and responsibilities language:

4.3 Duties and Responsibilities of the Local Administrator

Duties of the local administrator shall include, but not be limited to:

4.3-1 Provide Base Flood Elevation and Freeboard

When base flood elevation has been provided in accordance with Section 3.2, Basis for Establishing the Areas of Special Flood Hazard, and the local administrator shall provide it to the Building Official along with any freeboard requirements established in Section 5.2 Specific Standards.
When base flood elevation data has not been provided (A and V Zones) in accordance with Section 3.2, Basis for Establishing the Areas of Special Flood Hazard, the local administrator shall obtain, review, and provide any base flood elevation and floodway data available from a Federal, State or other source, in order to administer Sections 5.2, Specific Standards, and 5.3 Floodways and the Building Codes.

18.96.040 Conditional Uses Permitted.

This section concerns what uses are conditionally permitted in the special flood hazard area.

18.96.040(B), Material or equipment stored shall include only items which will not create a hazard to the health or safety of persons, property, animals or plant life should the storage area be inundated.

Comment: The Deschutes County Code does not explicitly prohibit storage of hazardous materials in the floodplain. Stored materials can become debris during a flood event. The Model Washington NFIP-ESA Ordinance provides an example of more explicit language:

Section 5.3 Hazardous Materials:

A. No new development shall create a threat to public health, public safety, or water quality. Chemicals, explosives, gasoline, propane, buoyant materials, animal wastes, fertilizers, flammable liquids, pollutants, or other materials that are hazardous, toxic, or a threat to water quality are prohibited from the Special Flood Hazard Area. This prohibition does not apply to small quantities of these materials kept for normal household use. This prohibition does not apply to the continued operations of existing facilities and structures, reuse of existing facilities and structures, or functionally dependent facilities or structures.

B. If the proposed project will cannot meet section 5.3(A) of this ordinance then a habitat assessment must be conducted in accordance with Habitat Impact Assessment and Habitat Mitigation Plan.

18.96.040(I). All new construction, expansion or substantial improvement of an existing dwelling, an agricultural related structure, a commercial, industrial or other non-residential structure, or an accessory building.

Comment: The minimum requirement of the NFIP treats any structure that will incur improvements totaling more than 50% of the market value of the structure, as a new structure – meaning the structure will need to be elevated above base flood elevation (BFE) and meet other flood protection measures. According to FEMA’s Higher Floodplain Management Regulatory Standards, some communities have reduced this 50% threshold and have begun to track these improvements over time (i.e., the structure must be elevated if they received flood damage two times over the past 10 years, of which the cost to repair after each flood equals 25% of the market value on average). In addition, applying the standard to cumulative...
substantial improvement would apply the NFIP regulation for improvements over the lifetime of the structure.

18.96.050 Prohibited Uses
The list of prohibited uses is limited to marinas, boat slips, and boat houses on private property.

Comment: Critical facilities are vital to flood response activities or critical to the health and safety of the public before, during, and after a flood, such as a hospital, emergency operations center, electric substation, police station, fire station, nursing home, school, vehicle and equipment storage facility, or shelter. Facilities that, if flooded, would make the flood problem and its impacts much worse, such as a hazardous materials facility, power generation facility, water utility, or wastewater treatment plant. Given this, it is prudent to require these facilities to be sited outside of the floodplain unless no viable alternative exists. The Deschutes County Code does not define critical facilities or prohibit development in the special flood hazard area. The Model Washington NFIP-ESA Ordinance, Section 5.4, provides language specific to critical facilities:

Critical facility:

A structure or other improvement that, because of its function, size, service area, or uniqueness, has the potential to cause serious bodily harm, extensive property damage, or disruption of vital socioeconomic activities if it is destroyed or damaged or if its functionality is impaired. Critical facilities include health and safety facilities, utilities, government facilities, and hazardous materials facilities. For the purposes of a local regulation, a community may also use the International Codes’ definition for Category III and IV buildings.

5.4. Critical Facilities

A. Construction of new critical facilities shall be, to the extent possible, located outside the limits of the Special Flood Hazard Area.

B. Construction of new critical facilities in the Special Flood Hazard Area shall be permissible if no feasible alternative site is available, provided

1. Critical facilities shall have the lowest floor elevated three feet above the base flood elevation or to the height of the 500-year flood, whichever is higher. If there is no available data on the 500-year flood, the permit applicants shall develop the needed data in accordance with FEMA mapping guidelines.

2. Access to and from the critical facility shall be protected to the elevation of the 500-year flood.

Additional provisions provided by the Oregon Model Floodplain Ordinance include the following:
• Floodproofing and sealing measures must be taken to ensure that toxic substances will not be displaced by or released into floodwaters.

18.96.070. Application for Conditional Use.

This section concerns what materials are to be provided by the applicant and reviewed by staff.

18.96.070(E) The elevation of the lowest habitable floor and of any basement floor for any dwelling unit or structure.

Comment (1): The Oregon Model Floodplain Ordinance section 4.3.3(1) explicitly lists “below-grade crawl spaces” in addition to the requirements of 18.96.070(E). We recommend that the Planning Commission consider specifically listing “below-grade crawl spaces” in relation to elevation of the lowest habitable floor. A definition for below-grade crawl space has been offered in the section on Definitions (18.04) above.

Comment (2): Enclosed areas below the lowest floor are not intended for human habitation. A conversion of these areas to habitable space increases the risk to public health and safety. The Oregon Model Floodplain Ordinance section 4.3.6 provides sample language to consider:

4-3-6 Non-Conversion of Enclosed Areas below the Lowest Floor

To ensure that enclosed areas below the lowest floor continue to be used solely for parking vehicles, limited storage, or access to the building and not be finished for use as human habitation/recreation/bathrooms, etc., the Floodplain Administrator shall:

(1) Determine which applicants for new construction and/or substantial improvements have fully enclosed areas below the lowest floor that are 5 feet or higher;

(2) Require such applicants to enter into a “Non-conversion deed declaration for construction within flood hazard areas” or equivalent. The deed declaration shall be recorded with {city, county, tribe}, and shall be in a form acceptable to the Floodplain Administrator.

18.96.080. Criteria to Evaluate Conditional Uses

This section includes the criteria staff will use to review an application.

18.96.080(B) Approval to alter or relocate a water course shall require notification to adjacent communities, the Department of Land Conservation and Development and Department of State Lands, prior to any such alteration or relocation and submit evidence to the Federal Insurance Administration. Maintenance shall be provided within the altered and relocated portion of said watercourse so that the flood carrying capacity is not diminished.

Comment: The DCC does not currently explicitly require an applicant to obtain a Conditional Letter of Map Revision from FEMA before encroachments are permitted. The Oregon Model Floodplain Ordinance section 4.3.4(4) provides language to consider:
(4) Applicants shall obtain a Conditional Letter of Map Revision (CLOMR) from FEMA before any encroachment, including fill, new construction, substantial improvement, or other development, in the regulatory floodway is permitted. The applicant shall be responsible for preparing technical data to support the CLOMR application and paying any processing or application fees to FEMA.

18.96.080(D)(4) Below-grade crawlspace is allowed subject to the standards in FEMA Technical Bulletin 11-01.

Comment: Although Deschutes County Code and the Oregon Model Floodplain Ordinance both reference FEMA Technical Bulletin 11-01, the Oregon Model Floodplain Ordinance sections 5.2-6 explicitly lists specific requirements that create more transparent expectations for development. Note: the definition and appropriate crawlspace code must be included in the flood hazard development ordinance if below grade crawlspaces are allowed, otherwise below grade crawlsspaces will be considered to be basements. Structures built with below grade crawlspaces will have higher insurance premiums. Sections 5.2-6 (1)-(8) of the Oregon Model Floodplain Ordinance and FEMA Technical Bulletin 11-01 outline specific requirements for below-grade crawl spaces:

Section 5.2-6 Below-Grade Crawl Spaces:

(1) The building must be designed and adequately anchored to resist flotation, collapse, and lateral movement of the structure resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy. Hydrostatic loads and the effects of buoyancy can usually be addressed through the required openings stated in Section B below. Because of hydrodynamic loads, crawlspace construction is not allowed in areas with flood velocities greater than five feet per second unless the design is reviewed by a qualified design professional, such as a registered architect or professional engineer.

Other types of foundations are recommended for these areas.

(2) The crawlspace is an enclosed area below the base flood elevation (BFE) and, as such, must have openings that equalize hydrostatic pressures by allowing the automatic entry and exit of floodwaters. The bottom of each flood vent opening can be no more than one foot above the lowest adjacent exterior grade.

(3) Portions of the building below the BFE must be constructed with materials resistant to flood damage. This includes not only the foundation walls of the crawlspace used to elevate the building, but also any joists, insulation, or other materials that extend below the BFE. The recommended construction practice is to elevate the bottom of joists and all insulation above BFE.

(4) Any building utility systems within the crawlspace must be elevated above BFE or designed so that floodwaters cannot enter or accumulate within the system components during flood conditions. Ductwork, in particular, must either be placed above the BFE or sealed from floodwaters.
(5) The interior grade of a crawlspace below the BFE must not be more than two feet below the lowest adjacent exterior grade.

(6) The height of the below-grade crawlspace, measured from the interior grade of the crawlspace to the top of the crawlspace foundation wall must not exceed four feet at any point. The height limitation is the maximum allowable unsupported wall height according to the engineering analyses and building code requirements for flood hazard areas.

(7) There must be an adequate drainage system that removes floodwaters from the interior area of the crawlspace. The enclosed area should be drained within a reasonable time after a flood event. The type of drainage system will vary because of the site gradient and other drainage characteristics, such as soil types. Possible options include natural drainage through porous, well drained soils and drainage systems such as perforated pipes, drainage tiles or gravel or crushed stone drainage by gravity or mechanical means.

(8) The velocity of floodwaters at the site should not exceed five (5) feet per second for any crawlspace. For velocities in excess of five (5) feet per second, other foundation types should be used.

18.96.080(E) Subdivision and Partition Proposals

1. All subdivision and partition proposals shall be consistent with the need to minimize flood damage.

2. All subdivision and partition proposals shall have public utilities and facilities such as sewer, gas, electrical and water systems located and constructed to minimize flood damage.

3. All subdivision and partition proposals shall have adequate drainage provided to reduce exposure to flood damage.

Comment (1): The Deschutes County Code currently lacks requirements regarding density of development and the provision of open space within subdivisions. The Model Washington NFIP-ESA Ordinance addresses this concern by combining floodplain management with the provision of open space as an amenity to residents and a method of preserving the natural environment. The Model Washington NFIP-ESA Ordinance provides an example of use of open space requirements to manage density in the floodplain:

Section 5.1 Subdivisions:

B. The proposed subdivision must have one or more new lots in the Special Flood Hazard Area set aside for open space use through deed restriction, easement, subdivision covenant, or donation to a public agency.
1. In the Special Flood Hazard Area outside the Protected Area, zoning must maintain a low density of floodplain development.

2. In the Special Flood Hazard Area outside the protected area in which the current zoning is less than 5 acres must maintain the current zoning.

3. The density of the development in the portion of the development outside the Special Flood Hazard Area may be increased to compensate for the amount of land in the Special Flood Hazard Area preserved as open space in accordance with (section of the community’s zoning or other development ordinance that allows PUDs and/or transfers of development rights).

C. If a parcel has a buildable site outside the Special Flood Hazard Area, it shall not be subdivided to create a new lot, tract, or parcel within a binding site plan that does not have a buildable site outside the Special Flood Hazard Area. This provision does not apply to lots set aside from development and preserved as open space.

Comment (2): The Deschutes County Code lacks regulations to ensure subdivisions are accompanied by access roads that are both above the floodplain elevation and connect to land outside the floodplain. The Model Washington NFIP-ESA Ordinance Section 5.1(E) has specific language intended to ensure residents are able to safely evacuate in the event of a flood.

Section 5.1 Subdivisions:

E. All proposals shall ensure that all subdivisions have at least one access road connected to land outside the Special Flood Hazard Area with the surface of the road at or above the FPE wherever possible.

Comment (3): Deschutes County Code does not currently require subdivisions located within the special flood hazard areas (floodplain), a riparian habitat zone, or a channel migration area to be accompanied by a filed notice on the final recorded subdivision plat. Inclusion of this requirement would qualify for CRS credit. The Model Washington NFIP-ESA Ordinance provides notification language:

Section 5.1 Subdivisions:

G. The final recorded subdivision plat shall include a notice that part of the property is in the SFHA, riparian habitat zone and/or channel migration area, as appropriate.

18.96.080(G)(2): Nonresidential Construction

Comment: The Deschutes Code does not currently include provisions for a comprehensive Maintenance Plan or an Emergency Action Plan as outlined in the Oregon Model Floodplain Ordinance. Including such provisions may provide the community assurance that floodproofing protection measures are maintained and that the operators of the building exercise a plan of
action for the installation and sealing of the structure prior to a flooding event. Presented below for consideration are model sections from the Oregon Model Floodplain Ordinance:

5.2.2(6) Applicants shall supply a comprehensive Maintenance Plan for the entire structure to include but not limited to: exterior envelope of structure; all penetrations to the exterior of the structure; all shields, gates, barriers, or components designed to provide floodproofing protection to the structure; all seals or gaskets for shields, gates, barriers, or components; and, the location of all shields, gates, barriers, and components as well as all associated hardware, and any materials or specialized tools necessary to seal the structure.

5.2.2 (7) Applicants shall supply an Emergency Action Plan (EAP) for the installation and sealing of the structure prior to a flooding event that clearly identifies what triggers the EAP and who is responsible for enacting the EAP.

18.96.080(G)(3): Manufactured Homes

All manufactured homes to be placed or substantially improved shall be elevated on a permanent foundation such that the lowest floor of the manufactured home is at least one foot above the base flood elevation. Such manufactured homes shall be securely anchored to an adequately anchored foundation system subject to the provisions of Deschutes County Code 18.96.080(C)(1).

Comment: There is a typographical error in this code section. Deschutes County Code provisions for foundation anchoring are located in 18.96.080(D)(1). The manufactured homes provisions may be enhanced by including additional standards for the elevation of electrical crossover connections to be at least 12 inches above BFE.

ADDITIONAL INFORMATION

Oregon Residential Specialty Code (Oct. 1, 2014)

The new residential building code relies upon the local floodplain administrator to provide building officials with elevation of lowest floor, base flood elevation, and required freeboard rests (102.4.1). In addition, the building code includes a note that local communities can designate a building official or other staff as the local floodplain administrator, however, per ORS 455.210(3)(c), local communities are prohibited from using building permit fees for any purpose other than administration and enforcement of the building code (as such administration and implementation of NFIP requirements are not considered part of the building code).

Federal Emergency Management Agency and National Marine Fisheries Service

In July 2010 a lawsuit was settled in The US District Court between a coalition of environmental groups (Audubon Society of Portland, North West Environmental Defense Center, the National Wildlife Federation, and Association of Northwest Steelheaders), and the Federal Emergency
Management Agency (FEMA). The plaintiffs complained that FEMA had not consulted with National Oceanic and Atmospheric Administration, Fisheries Service (NOAA-F) under Section 7 of the Endangered Species Act (ESA) on the effects of the National Flood Insurance Program (NFIP) on ESA-listed anadromous fish. As a result, FEMA initiated consultation with NOAA-F in August of 2012. A final biological opinion, with accompanying reasonable and prudent alternatives, has yet to be published. It appears, however, that NOAA-F and FEMA might expect local government adopt and enforce development and avoidance standards based on revised maps provided by FEMA. Revised maps might include, for example, expanded flood zones, erosion zones and future conditions flood mapping. In addition, NOAA-may ask local government to regularly provide FEMA with statistics on how much and what type of development had been permitted in the flood hazards areas. FEMA and NOAA to ensure that regional development limits are not exceeded would monitor the flood zone acreage developed over time.

NOAA-F and FEMA appear to recognize that it will take some time to publish revised maps and fully implement the proposed changes. So it is expected that local government will be offered interim measures that if adopted will provide local government with take coverage under ESA Section 7 when development permits are issued in Special Flood Hazard Areas. These interim measures are likely to be modeled on EPA’s Low Impact Development and Green Infrastructure program and are intended to maintain natural and beneficial functions in the floodplain.
ATTACHMENT 1: RESOURCES

Association of State Floodplain Managers: A Guide for Higher Standards in Floodplain Management (2013). The higher standards options provided in the Association of State Floodplain Managers (ASFM) guide are described in detail because they are recommended for safer development and use the natural protection provided by the natural functions and resources of the floodplain. The model language presented in the document was developed to promote effective floodplain management, and mesh with the FEMA minimum flood damage reduction standards. ASFPM strongly believes the minimum NFIP floodplain regulations do not provide adequate long-term flood risk reduction for communities and that the benefits of flood risk reduction achieved by higher regulatory standards far outweighs the burden of administering them.

Floodplain Management: Higher Regulatory Standards (2002) This report from FEMA - Region 10 provides local communities with examples of regulatory land-use best practices that balance the need between floodplain development and maintaining the natural and beneficial functions of the floodplain. The report documents floodplain management strategies which include: modifications to local flood ordinances to reduce physical flood damages to structures, strategies to protect and enhance aquatic and riparian habitat, and upland runoff controls to reduce peak flood flows and improve water quality.

Floodplain Management: NFIP Guidebook (2009) This guidebook from FEMA – Region 10 is a local administrator’s guide to floodplain management and the National Flood Insurance Program (NFIP). The guide includes an overview of floodplain management concepts, mapping revision information, and detailed information regarding the NFIP’s floodplain development standards.

National Flood Insurance Program Community Rating System: Coordinator’s Manual (2013) The National Flood Insurance Program (NFIP) offers a voluntary incentive program called the Community Rating System (CRS). The CRS recognizes and rewards communities that exceed the minimum requirements for floodplain management as identified in the NFIP. The CRS provides premium insurance discounts, ranging between 5% and 45%, for communities that go beyond the minimum requirements. To participate in the CRS, a community must implement additional CRS management activities and earn CRS credit points for each activity. A community rating number is assigned to a community based on the number of CRS credits they have earned. The community rating scale ranges from 1 to 10. One is the highest rating available and offers a 45% flood insurance discount; 10 is the lowest rating available and offers no insurance discount. Examples of CRS activities range from providing citizens with information regarding flood insurance and ways to reduce flood damage, increase protection to new development, reduce flood risk to existing development, and provide early flood warning.

Planning for Natural Hazards: Flood Technical Resource Guide (2000) The guide is a resource and planning tool for local governments to develop land use strategies that reduce the risks posed by flood hazards. The guide provides information on flood hazards, state and
federal laws that address flooding, and technical information on reducing the risk of flooding. The guide also addresses flood hazard issues through effective comprehensive inventories, policies and implementing measures.

**Ramping Up Salmon Recovery Efforts through Floodplain Management (2014)** The document provides a framework for local governments to amend local floodplain management programs to better address potential impacts to aquatic life. The document also describes changes that FEMA has made regarding how it will evaluate map revisions to include the Endanger Species Act.

**Technical Bulletin 11-01: Crawlspace Construction for Buildings Located in Special Flood Hazard Areas (2001).** This technical bulletin from FEMA provides interim guidance on minimum NFIP requirements as well as best practices for crawlspace construction in the Special Flood Hazard Area. The Technical Bulletins provide guidance concerning the building performance standards of the NFIP. The bulletins do not create regulations, rather they provide specific guidance for complying with the minimum requirements of existing NFIP regulations.