Draft Environmental Assessment

Central Oregon Wildfire Mitigation Project

Crook County, Oregon

FEMA-PDMC-PJ-10-OR-2010-001

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FEMA

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Table of Contents

Acronyms and Abbreviations

APE	Area of Potential Effects
BLM	Bureau of Land Management
CAA	Clean Air Act of 1970
CCC	Civilian Conservation Corps
CCS	cryptocrystalline silicate
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO	carbon monoxide
County	Crook County
DPS	distinct population segment
EA	Environmental Assessment
EO	Executive Order
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act of 1973
FEMA	Federal Emergency Management Agency
FONSI	Finding of No Significant Impact
FPPA	Farmland Protection Policy Act of 1981
F.R.	Federal Register
GIS	Geographic Information System
IHMT	Interagency Hazard Mitigation Team
MBTA	Migratory Bird Treaty Act of 1918
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NFPA	National Fire Protection Association
NHPA	National Historic Preservation Act
NO_2	nitrogen dioxide
NRHP	National Register of Historic Places
O_3	ozone
OAR	Oregon Administrative Rule
ODEQ	Oregon Department of Environmental Quality
ODF	Oregon Department of Forestry

ODFW	Oregon Department of Fish and Wildlife
OEM	Oregon Office of Emergency Management
OHWM	ordinary high water mark
OID	Ochoco Irrigation District
ORBIC	Oregon Biodiversity Information Center
Pb	lead
PDM	Pre-Disaster Mitigation
$PM_{2.5}$	particulate matter with a diameter of 2.5 microns or less
PM_{10}	particulate matter with a diameter of 10 microns or less
SHPO	State Historic Preservation Officer
SO_2	sulfur dioxide
TMDL	Total Maximum Daily Load
URS	URS Group, Inc.
U.S.C.	U.S. Code
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WQMP	Water Quality Management Plan
WUI	wildland-urban interface

Glossary

Area of Potential Effects (APE): Geographic area or areas within which an undertaking may cause changes in the character or use of historic properties, if such properties exist. The APE is influenced by the scale and nature of the undertaking.

Best Management Practice: Environmental protective measure for conducting projects in an environmentally responsible manner.

Crown fire: Fire that involves the tops of the canopy trees in the forest; can spread rapidly.

Defensible space: Clearing between wildland vegetation and structures.

Extirpated: Condition of a species that has ceased to exist in a geographic area.

Fuels reduction: Removal of excess flammable vegetation through thinning, limbing, or other methods to reduce the potential for severe wildfires.

Limbing: Removal of large tree limbs to reduce fuel load and the potential for crown fires.

Loam: Well-drained soils composed of sand, silt, and clay in relatively equal proportions.

Ordinary high water mark (OHWM): Point on a bank or shore up to which the presence and action of the water leaves a distinct mark by erosion, destruction of terrestrial vegetation, or other easily recognized characteristic.

Oregon Forestland-Urban Interface Fire Protection Act (Senate Bill 360): Requires property owners in forestland-urban interface areas that have been identified by county committees to reduce excess vegetation around structures and drives.

Prescribed burn: Fire ignited for vegetation management.

Slash: Vegetative debris created by property clearing, right-of-way clearing, or forest management activities.

Suppression: Response to a wildfire that results in the curtailment of fire spread and elimination of all identified threats from the fire.

Thinning: Partial removal of trees, branches, or shrubs from a stand to reduce fuel loads.

Wildfire: Unwanted wildland fire.

Wildland-urban interface: Line, area, or zone where structures and other human development meet or intermingle with vegetative fuels in wildlands.

SECTION ONE INTRODUCTION

Crook County, OR, has applied for fiscal year 2010 funding under the Federal Emergency Management Agency (FEMA) Pre-Disaster Mitigation (PDM) grant program for financial assistance for the Central Oregon Wildfire Mitigation Project in Crook County (County) (Proposed Action).

The Proposed Action targets the communities of Prineville-Crook County Airport (Airport), Grizzly, Juniper Canyon, Marks Creek, Millican Road, Ochoco Reservoir, Powell Butte 1, and Powell Butte 2. "Community" refers to the area surrounding and the residents who live near a natural feature (e.g., Marks Creek) or manmade feature (e.g., Millican Road). The eight communities are all in Crook County and are referred to collectively as the project area.

Table 1-1 is a list of the communities that comprise the project area and the number of acres and lots in each community. The locations of the communities are shown in Appendix A, Figures 1 through 9.

Table 1-1: Acreage and Number of Lots in the Eight Communities in the Project Area

Community	Acres	Lots
Airport	1,043	280
Grizzly	797	525
Juniper Canyon	6,721	2,900
Marks Creek	139	40
Millican Road	77	11
Ochoco Reservoir	1,275	270
Powell Butte 1	1,414	300
Powell Butte 2	167	31

The objective of the PDM grant program is to provide funding for pre-disaster mitigation planning and projects that primarily address natural hazards in States, Territories, and federally recognized Indian Tribes to reduce risks to vulnerable populations and structures while also reducing reliance on funding from actual disaster declarations. The PDM is administered by the Oregon Office of Emergency Management (OEM).

This Environmental Assessment (EA) has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, as amended (42 U.S.C. §§ 4321–4327); the President's Council on Environmental Quality (CEQ) regulations to implement NEPA (40 CFR Parts 1500–1508); and FEMA's regulations implementing NEPA (44 CFR Part 10). FEMA is required to consider potential environmental impacts before funding or approving actions or projects.

The purpose of this EA is to analyze the potential environmental impacts of the Central Oregon Wildfire Mitigation Project. FEMA will use the findings in this EA to determine whether an Environmental Impact Statement is required or a Finding of No Significant Impact (FONSI) should be issued.

SECTION TWO PURPOSE AND NEED

The purpose of the PDM grant program is to reduce overall risks to vulnerable populations and structures, while also reducing reliance on funding from actual disaster declarations. The purpose of the Central Oregon Wildfire Mitigation Project is to help protect residents and firefighters in the project area in the event of a wildfire and to reduce the potential impacts of a catastrophic wildfire in the communities. The need for this action is detailed below.

The *Crook County Community Wildfire Protection Plan* (Crook County 2014a) identifies the project area communities as being in the wildland-urban interface (WUI). The Wildfire Protection Plan also provides a risk assessment of the communities grouped into three risk assessment areas. The Juniper Canyon risk assessment area includes the Juniper Canyon community; the McKay risk assessment area includes the Grizzly, Marks Creek, and Ochoco Reservoir communities; and the Powell Butte risk assessment area includes the Airport, Grizzly, Millican Road, Powell Butte 1, and Powell Butte 2 communities.

The risk assessment areas are rated for wildfire risk (fire occurrence per 1,000 acres per 10 years), hazards (e.g., weather, topography, fuels), protection capabilities (e.g., capacity and resources for fire prevention measures), values protected (e.g., structural density, critical infrastructure), and structural vulnerabilities (likelihood that structures will be destroyed by wildfire). As shown in Table 2-1, the risk assessment ratings vary from low to extreme.

Table 2-1: Risk Assessment Ratings for the Juniper Canyon, McKay, and Powell Butte Risk Assessment Areas

Category	Risk Assessment Rating		
	Juniper Canyon(1)	McKay(2)	Powell Butte(3)
Wildfire risk	High	Moderate	High
Hazards	Extreme	Extreme	Extreme
Protection capabilities	Low	Moderate	Moderate
Values protected	High	Moderate	Moderate
Structural vulnerabilities	High	High	High

Source: Crook County (2014a)

(1) Juniper Canyon risk assessment area includes the Juniper Canyon community

(2) McKay risk assessment area includes the Grizzly, Marks Creek, and Ochoco Reservoir communities

(3) Powell Butte risk assessment area includes the Airport, Grizzly, Millican Road, Powell Butte 1, and Powell Butte 2 communities

The critical infrastructure in each risk assessment area is listed in Table 2-2.

Table 2-2: Critical Infrastructure in the Juniper Canyon, McKay, and Powell Butte Risk Assessment Areas

Category	Juniper Canyon[1]	McKay[2]	Powell Butte[3]
Transportation / road system	X	X	X
Electrical power lines	X	X	X
Emergency and communication facilities	X	X	X
Public agency facilities	X	X	X
School facilities	X	X	X
Campgrounds and recreational facilities	X	X	X
Other	Dry Creek Airpark	—	Prineville-Crook County Airport National Guard Armory

Source: Crook County (2014a)

(1) Juniper Canyon risk assessment area includes Juniper Canyon community

(2) McKay risk assessment area includes the Grizzly, Marks Creek, and Ochoco Reservoir communities

(3) Powell Butte risk assessment area includes the Airport, Grizzly, Millican Road, Powell Butte 1, and Powell Butte 2 communities

According to the *Crook County Natural Hazards Mitigation Plan* (Crook County 2010), the County has experienced three large WUI fires in the last decade and several smaller fires that had the potential to cause major impacts on interface areas and critical infrastructure. Residential development continues to expand farther into areas traditionally covered by wildland vegetation in the WUI.

There are extensive areas of private land in the County that receive no wildland fire protection and/or structural fire protection. The northern part of the Grizzly community along NW Grizzly Mountain Road, the Marks Creek community, and the easternmost properties along U.S. Highway 26 in the Ochoco Reservoir community are outside the Crook County Fire & Rescue's response area. In the past 10 years, approximately 18,292 acres in the County have been burned by wildfire (Deschutes County 2014). Within the period between 2002 and 2011, there were 17 fires in the Juniper Canyon risk assessment area, 278 fires in the McKay risk assessment area, and 115 fires in the Powell Butte risk assessment area (Crook County 2014a).

In addition to characterizing wildfire risks and prioritizing mitigation, the County has standards for development in forestry zones that are based on Oregon Department of Forestry (ODF) standards. These pertain to access roads, siting dwellings, and maintaining a primary fuel break (Crook County 2014b). These requirements do not fully address wildfire vulnerabilities in WUI developments prior to when they took effect.

SECTION THREE ALTERNATIVES

This section discusses the No Action Alternative, the Proposed Action, to which FEMA funding would contribute, and the alternatives that were considered and dismissed.

3.1 NO ACTION ALTERNATIVE

Under the No Action Alternative, no FEMA-funded fuels reduction and mitigation would occur in the project area. The risk of wildfire in the wildland-urban interface (WUI) would continue as a result of the existing untended heavy-ladder fuel and poor access for emergency responders. At-risk property owners would continue to implement wildfire mitigation activities on their own initiative or as otherwise assisted or required by the County or homeowners association or insurance providers.

3.2 PROPOSED ACTION

The description of the Proposed Action is based primarily on Crook County's 2010 PDM grant application for the Proposed Action and the subsequent revisions to the application.

The County would work with Crook County Fire & Rescue and other local emergency service providers to implement the Proposed Action through its *Fire Ready* program. Implementation would occur over 36 months.

The Proposed Action would consist of the following activities, which would be implemented only for the property owners in the project area who elect to participate:

- Plan, supervise, manage, and administer project activities and funding.
- Develop and adopt program criteria, policies, and operating guidelines.
- Communicate project readiness to property owners and compile a working inventory of participants.
- Conduct assessments of participating properties, determine appropriate treatment strategies, and establish buffers for avoidance areas.
- Hire contractors or use County staff to implement treatment measures where participating property owners need assistance, and to haul and dispose of curbside vegetative debris.
- Inspect treated properties for compliance.
- Administer grant funds, manage matching contributions, and authorize and monitor expenditures.
- Monitor and evaluate program effectiveness and adjust if needed to achieve treatment goals.
- Prepare and submit status reports and communicate project results to OEM.
- Explore ways to make the program self-sustaining over the long term.

The Proposed Action would be implemented according to the Firewise guidelines for defensible space in *Introduction to Firewise Principles* (NFPA 2009). The National Fire Protection Association (NFPA) Firewise program is sponsored by the U.S. Forest Service (USFS), U.S. Department of the Interior, and National Association of State Foresters.

The Firewise guidelines for defensible space (NFPA 2009) include the following:

- Create a defensible space zone with at least a 30-foot radius around a structure's foundation as a primary fuel break. The radius may be expanded to provide additional defensible space around structures on steep slopes.
- Plant grass and small islands of fire-resistant plants in the defensible space.
- Trim trees in the defensible space so the lowest branches are 6 to 10 feet above the ground.
- Space plants in the defensible space so the plants or plant canopies do not touch; use wider spacing along slopes.
- Plant fire- or drought-resistant plants in the defensible space.
- Do not remove all vegetation in the defensible space because doing so can increase soil erosion, especially on sloped areas, which are found in much of the project area.

Appendix A, Figure 10, illustrates the Firewise guidelines, and Figure 11 shows an example of a treated property that was protected from a wildfire.

The County's requirements for fuels reduction projects, intended to mirror Senate Bill 360 standards, are listed in Appendix B, would also be followed as they pertain to vegetation. The requirements pertain to, for example, dead and downed materials, tree and shrub thinning, and nonflammable construction materials. The requirements also describe a secondary fuel break which would extend an additional 20 to 70 feet depending on the risk classification and the type of roofing on the structure.

Examples of the types of vegetation to be treated are ponderosa pines (*Pinus ponderosa*), Douglas firs (*Pseudotsuga menziesii*), lodgepole pines (*Pinus contorta*), junipers (*Juniperus occidentalis*), sagebrush, bitterbrush, and invasive species. Ladder fuels and other biomass would be treated, consistent with the Oregon Forestland-Urban Interface Fire Protection Act (Senate Bill 360), using chainsaws, clippers, brush mowers, and masticators. Vegetative debris would be chipped onsite, with some limited burning of piles, or hauled away and disposed of at the Crook County Transfer Station and Recycling Center in Prineville. Burning of piles onsite would require compliance with the Crook County Fire & Rescue's outdoor burning regulations, which includes a burn ban from July through October (Crook County Fire & Rescue 2014).

Limited ground disturbance would occur during fuel-reduction activities. No work would be allowed in wetlands or water bodies. Per ODF water protection rules, vegetation management activities would be restricted within riparian management areas between 10 to 100 feet from a stream's ordinary high water mark (OHWM) depending on the size of the stream (i.e., small, medium, large) and water classification (i.e., fish use, domestic use, all other streams) (ODF 2014, OAR 629-635). Riparian management area restrictions would include retaining understory vegetation within 10 feet of the OHWM, trees within 20 feet of the OHWM, all trees leaning over a channel, and all downed wood and snags (ODF 2014, OAR 629-640).

Project activities would occur in the project area on properties that were developed prior to the County's existing wildfire mitigation codes. See Table 1-1 for a list of the acreages and number of lots in the communities that comprise the project area. As part of this project, the County anticipates treating a total of about 1,200 acres scattered within these communities.

The site assessment and treatment plan would be documented for each participating property using the checklist in Appendix C. Participating property owners would provide personal labor and/or materials and commit to maintain the property's defensible space once established for 5 years.

3.3 ALTERNATIVES CONSIDERED AND DISMISSED

Three alternatives were considered and dismissed.

The first alternative involved more stringent County and community restrictions to control fires and protect residents than the Proposed Action and would consist of restricting development in the WUI, requiring retrofits on existing homes in the WUI to ignition-resistant building materials, and mandating property in the WUI be maintained to Senate Bill 360 standards. The measures are potentially more intrusive and unenforceable and would require time for government and/or citizen approval and implementation.

The second alternative was the removal of vegetation through prescribed burning, but the risk of an escaped fire would be high considering the treatment objective is to establish defensible space close to existing structures. Multiple burn locations throughout the project area would be required to effectively manage fuel loads. Prescribed burning is most effective in areas with existing light fuel loads and few structures. The risk to the residual forest increases the heavier the fuel load or the higher the elevations. This alternative was dismissed because it was considered too dangerous.

The third alternative was the replacement of flammable structural materials with fire-resistant materials. This alternative would not address the lack of defensible space or heavy fuel loads. It would also be more costly and potentially less effective than vegetation removal.

SECTION FOUR AFFECTED ENVIRONMENT AND POTENTIAL IMPACTS

This section discusses the potential impacts of the No Action Alternative and the Proposed Action on six categories of environmental resources (physical, water, biological, cultural, socioeconomic, and recreation). The potential cumulative environmental impacts are also discussed (see Section 4.7).

The impact analysis follows the same approach for all resource categories. When possible, quantitative information is provided to establish potential impacts, and the potential impacts are evaluated qualitatively based on the criteria listed in Table 4-1.

Table 4-1: Evaluation Criteria for Potential Impacts

Impact Scale	Criteria
None/negligible	The resource area would not be affected, or changes would either be non-detectable or if detected, the effects would be slight and local. Impacts would be well below regulatory standards, as applicable.
Minor	Changes to the resource would be measurable, but the changes would be small and localized. Impacts would be within or below regulatory standards, as applicable. Mitigation measures would reduce any potential adverse effects.
Moderate	Changes to the resource would be measurable and have both localized and regional impacts. Impacts would be within or below regulatory standards, but historical conditions would be altered temporarily. Mitigation measures would be necessary, and the measures would reduce any potential adverse effects.
Major	Changes to the resource would be readily measurable and would have substantial consequences on local and regional levels. Impacts would exceed regulatory standards. Mitigation measures to offset the adverse effects would be required to reduce impacts, but long-term changes to the resource would be expected.

Impacts are predicted based on the degree of change or loss of the resource from the baseline conditions. Impacts may be direct or indirect. Direct impacts are caused by an action and occur at the same time and place as the action. Indirect impacts are caused by an action and occur later or are farther removed from the area but are still reasonably foreseeable (40 CFR Part 1508).

4.1 PHYSICAL RESOURCES

4.1.1 Geology and Soils

The topography of Crook County is characterized by the Ochoco Mountain Range to the northeast, the Maury Mountain Range to the southeast, the Powell Buttes to the west, and the Grizzly and Grey Buttes to the north (Crook County 2010). Major geology units in the County include Picture Gorge Basalt, John Day Formation, tuffaceous facies of Clarno Formation, and silicic ash-flow tuff (USGS 2014). Geologic compositions are primarily lava flows, mudflows, tuffs, tuffaceous sedimentary rocks, basalt, andesite, and volcanic and fluviatile deposits (ODGMI 2009).

Soils in the project area are predominantly gravelly/coarse loam and sand (ranging from well-drained to poorly drained) overlaying volcanic deposits, with areas of exposed bedrock. Wind and water typically cause the most erosion in the project area. Major soil types include Icene-Playas complex, Mesman loamy fine sand, Mesman fine sandy loam, Housefield mucky silt loam, Homefield mucky silt loam, Simas-Sorf complex, Deschutes ashy sandy loam, Ninemile-Madeline complex, and Lambring-Rock outcrop complex (USDA 2014).

The Farmland Protection Policy Act of 1981 (FPPA), as amended (7 U.S.C. §§ 4201 et seq.), requires that Federal agencies minimize the extent to which their programs contribute to the unnecessary conversion of prime farmland, unique farmland, and land of statewide or local importance to non-agricultural uses. Farmlands subject to FPPA requirements may be forestland, pastureland, or cropland, but cannot be urban built-up land.

The project area contains the following acreages of prime farmlands and farmlands of statewide or unique importance:

- Airport: approximately 1,043 acres
- Grizzly: 152 acres
- Juniper Canyon: 1,331 acres
- Millican Road: 77 acres
- Ochoco Reservoir: 1,235 acres
- Powell Butte 1: 1,309 acres
- Powell Butte 2: 167 acres

Information on prime farmlands and farmlands of statewide or unique importance is available for only part of the Grizzly and Juniper Canyon communities and not available for the Marks Creek community (USDA 2014).

4.1.2 Air Quality

The Clean Air Act (CAA) of 1970, as amended (42 U.S.C. §§ 7401–7661), requires that States adopt ambient air quality standards. The standards have been established to protect the public from potentially harmful amounts of pollutants.

Under the CAA, the U.S. Environmental Protection Agency (EPA) establishes primary and secondary air quality standards. Primary air quality standards protect the public health, including the health of sensitive populations such as people with asthma, children, and older adults. Secondary air quality standards protect public welfare by promoting ecosystem health and preventing decreased visibility and damage to crops and buildings (EPA 2013).

The EPA has set National Ambient Air Quality Standards (NAAQS) for the following six criteria pollutants: ozone (O_3), particulate matter (particulate matter with a diameter of 2.5 microns or less [$PM_{2.5}$], particulate matter with a diameter of 10 microns or less [PM_{10}]), nitrogen dioxide (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), and lead (Pb) (EPA 2013).

The Prineville - Davidson Park site, which is in Crook County and nearest to the project area, is monitored for $PM_{2.5}$ annually, and the site has current "Good" 1-hour and 24-hour air quality ratings, which indicate that air quality is satisfactory in the vicinity and that air pollution poses little or no risk (ODEQ 2014a).

Given the frequency of wildfires in Oregon, the Oregon Department of Environmental Quality (ODEQ) worked with Federal agencies and other State agencies to produce the *Oregon Wildfire Response Protocol for Severe Smoke Episodes* (ODEQ 2014b), which addresses public health risk from severe smoke and recommends public health actions and agency responsibilities. Wildfire smoke contains gases and fine particles, which include O_3, CO, and particulate matter (i.e., $PM_{2.5}$). The amount and duration of smoke exposure—and a person's age and degree of susceptibility—contribute to potential health problems. Communities exposed to wildfire smoke are advised to check current ODEQ air quality information, the Oregon Smoke Blog, and public health messages. Other recommendations include staying inside as much as possible, avoiding outdoor physical activity, keeping windows and doors closed, and recirculating air conditioners. Generally, those who are most at risk from wildfire smoke are older adults, children, pregnant women, smokers, and individuals with respiratory infections or cardiovascular disease.

4.1.3 Climate Change

Draft NEPA Guidance on Consideration of the Effects of Climate Change and Greenhouse Gas Emissions (CEQ 2010) contains guidance on how Federal agencies should consider climate change in their decisions and suggests that quantitative analysis should be done if an action would release more than 25,000 metric tons of greenhouse gases per year.

The County is in the high desert region and receives relatively low annual precipitation. During the winter, colder temperatures and higher precipitation occur at higher elevations in the Ochoco Mountains and Maury Mountains in the northern and eastern portions of the County. Temperatures in Prineville in degrees Fahrenheit range from highs in the 80s in the summer to the 40s in winter, and lows range from the 40s in the summer to the 20s in the winter. The average annual precipitation is 10.5 inches, and the average annual snowfall at Prineville is 9.2 inches (Oregon Climate Service 2014).

Global and regional climate change is expected to accelerate in the coming decades. According to the *Oregon Climate Assessment Report* (OCCRI 2010), temperatures could increase by 0.2 to 1 degree per decade.

Warmer, drier summers are predicted, with summer precipitation decreasing 14 percent by the 2080s (OCCRI 2010). Generally, hotter and drier conditions contribute to larger wildfires and longer fire seasons. Increased fire probability in the region as a result of changing climatic conditions in the coming years could put communities in the WUI at increased risk.

4.1.4 Consequences of Alternatives

No Action Alternative

Under the No Action Alternative, FEMA would not provide funding for vegetation removal; however, some wildfire mitigation activities would be expected to continue as initiated by property owners, through existing local programs or requirements, or as required by homeowners insurance providers. There would be no impacts on geology. Soil resources in the project area would be affected by erosion if vegetation is burned in a catastrophic wildfire; steep slopes would be particularly affected. A significant loss of mature vegetation along steep slopes could increase the risk of landslides and thus the risk to proximate structures and infrastructure.

No increase in open burning and associated negative air quality effects would occur in the County from a minimal number of project area participants burning piles of vegetative debris onsite. Open burning would continue to occur regularly by property owners in the County in accordance with restrictions set forth by Crook County Fire & Rescue.

In the event of a wildfire, air quality would likely decline, putting the elderly, school children, and other vulnerable populations at risk. Depending on the air quality advisory, the public could be advised to change their daily activities, including outdoor work and essential errands, and school cancellations could occur. If the risk of wildfire increases as a result of climate change, the project area could be even more vulnerable to wildfire impacts in the decades ahead. Although wildfires are a natural element of the ecosystem, a large wildfire can release more than 25,000 metric tons of greenhouse gases, thereby incrementally contributing to climate change. Adverse impacts would range from minor to moderate, depending on the severity and location of a wildfire and the subsequent air pollution and soil erosion.

Proposed Action

Adverse impacts on geology and climate would be negligible based on the scale of the project and the limited ground-disturbing activities. Ground-disturbing activities may occur if shrub and tree roots are removed. However, in most cases, thinning and limbing would provide sufficient fuels reduction, and complete removal of shrubs and trees (including roots) would be limited.

Some soil could be disturbed during project activities, but adverse impacts would be negligible based on the low-impact nature of vegetation removal by hand and the proposed protective stream buffers. Since the project does not involve changes in land use, no impacts to prime or unique farmlands would occur.

An increase in open burning could occur in the County from a minimal number of project area participants burning piles of vegetative debris onsite. While this could have a temporary negative affect on air quality in the project area, it would be minor because of the limited anticipated increase in open burning which would be scattered geographically and occur at different times of the year, along with restrictions from Crook County Fire & Rescue, including avoidance during the wildfire season.

Fuel-reduction activities would occur on a localized scale and focus on protection of structures in contiguous areas, thus likely reducing the spread/severity of wildfires. Reducing the risk or severity of wildfires would generally have a positive effect on air quality and climate change because of the consequent reduction in air pollution and greenhouse gas releases.

4.2 WATER RESOURCES

4.2.1 Surface Water

The project area is in the Deschutes Basin, which originates east of the project area in the Ochoco Mountains, has approximately 10,000 square miles, and is the second largest watershed in Oregon. Numerous streams flow through the project area in the Deschutes Basin, including Antelope Creek, Dry Creek, Dry River, Crooked River, Johnson Creek, Lytle Creek, Marks Creek, and Mill Creek. Lakes and springs near the project area include Johnson Creek Reservoir, Marks Lake Reservoir, Ochoco Reservoir, and Prineville Reservoir.

The Deschutes Basin has seven subbasins, two of which fall within the project area (OSU 2014). Most of the project area is in the Lower Crooked subbasin. The southern end of the Juniper Canyon community where Antelope Creek flows into the Prineville Reservoir is the only community in the Upper Crooked subbasin. The streams in the subbasins that are in the project area are as follows:

- **Airport.** The Peoples Irrigation Company Ditch abuts the northern end of the community, and several of its tributaries flow through the project area.
- **Grizzly.** Lytle Creek flows along the eastern side of the community, and several of its tributaries flow through the project area to the west.
- **Juniper Canyon.** On the western side of the project area, Crooked River and its tributaries flow to the Prineville Reservoir. Dry River and its tributaries flow through the central portion of the project area. Antelope Creek and its tributaries flow through the southern portion of the project area into Prineville Reservoir.

- **Marks Creek.** Marks Creek and Marks Lake Reservoir are located within the community. Several tributaries to Marks Creek, including Hamilton Creek, Cornez Creek, Long Hollow Creek, McGinnis Creek, Rail Creek, Reilly Creek, and Rush Creek also flow through the project area.
- **Millican Road.** Crooked River is approximately 3,500 feet east of the community.
- **Ochoco Reservoir.** On the western side of the community, Johnson Creek and its tributaries flow to the Johnson Creek Reservoir, and the creek continues as the Ochoco Main Canal to the Ochoco Reservoir. Several unnamed streams flow south through the central part of the community to Ochoco Reservoir. On the eastern side of the community, Mill Creek and Polly Creek and their tributaries flow through the community south to the Ochoco Reservoir and Ochoco Creek.
- **Powell Butte 1.** The Central Oregon Canal flows diagonally adjacent to and between the treatment areas of the community. Nine tributaries to the Central Oregon Canal run south through the community. A tributary to Dry River also flows through the community on the northern end.
- **Powell Butte 2.** Dry River is approximately 1,200 feet east of the community.

4.2.2 Wild and Scenic Rivers

The National Wild and Scenic Rivers System was created by Congress in 1968 (Public Law 90-542; 16 U.S.C. 1271 et seq.) to preserve certain rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations.

Rivers may be designated for the National Wild and Scenic Rivers System by Congress or if certain requirements are met, by the Secretary of the Interior. Each river is administered by either a Federal or State agency. Designated segments do not need to include the entire river and may include tributaries. For federally administered rivers, the designated boundaries generally extend to an average of 0.25 mile on either bank in the Lower 48 States to protect river-related values.

Rivers are classified as wild, scenic, or recreational. Wild river areas are generally inaccessible except by trail, with primitive, unpolluted watersheds or shorelines. Scenic river areas are accessible in places by roads, with largely primitive and undeveloped shorelines. Recreational river areas are readily accessible by road or railroad, may have development along the shoreline, and may have undergone some impoundment or diversion in the past.

A 9-mile reach of the Crooked River is classified as recreational in the National Wild and Scenic Rivers System and is approximately 0.6 mile west of the Juniper Canyon community. The reach was designated in October 1988 and is managed by the Bureau of Land Management (BLM), Prineville District. This reach flows through vertical basalt canyons and extends to the Prineville Reservoir (NWSR 2014).

4.2.3 Water Quality

Section 303(d) of the Clean Water Act of 1977, as amended (33 U.S.C. § 1313(d)(2)), establishes requirements for States and Tribes to identify and prioritize water bodies that do not meet water quality standards. Total Maximum Daily Loads (TMDLs) are the maximum amount of a pollutant that a stream can receive and still meet water quality standards. A stream that is below the TMDLs typically requires a Water Quality Management Plan (WQMP). Category 5 waters are water quality limited, do not meet standards, and require a WQMP. Category 3 waters have insufficient data to determine whether a standard is met, and Category 2 waters attain some water quality standards.

Data from ODEQ were queried to determine whether any streams in the project area are considered impaired or waters of concern. Water quality concerns within or near the project area are as follows:

- **Airport.** No impaired streams or waters of concern were identified (ODEQ 2012).
- **Grizzly.** No impaired streams or waters of concern were identified (ODEQ 2012).
- **Juniper Canyon.** Crooked River in this community is rated Category 2 for dissolved oxygen and is in attainment for temperature (ODEQ 2012). The Lower Crooked subbasin and Upper Crooked subbasin TMDL (ODEQ 2014c) WQMP are in progress.
- **Marks Creek.** Marks Creek in this community is rated Category 3 for dissolved oxygen and Category 5 for temperature (ODEQ 2012). The Lower Crooked subbasin TMDL (ODEQ 2014c) WQMP is in progress.
- **Millican Road.** No impaired streams or waters of concern were identified (ODEQ 2012).
- **Ochoco Reservoir.** Ochoco Creek in this community is rated Category 3 for dissolved oxygen and is in attainment for temperature (ODEQ 2012). Mill Creek in this community is rated Category 3 for dissolved oxygen and Category 5 for temperature (ODEQ 2012). The Lower Crooked subbasin TMDL (ODEQ 2014c) WQMP is in progress.
- **Powell Butte 1.** No impaired streams or waters of concern were identified (ODEQ 2012).
- **Powell Butte 2.** No impaired streams or waters of concern were identified (ODEQ 2012).

The stream temperature standard is designed to protect the rearing and spawning of cold water fish (salmonids). Stream temperature can be affected by the condition of riparian vegetation and associated shading. A minimum amount of dissolved oxygen must be present in water for aquatic life to survive and can be reduced by temperature, turbidity, and sedimentation.

4.2.4 Wetlands

Executive Order (EO) 11990, Protection of Wetlands, requires Federal agencies, in planning their actions, to consider alternatives to wetland sites and to limit potential damage if an activity affecting a wetland cannot be avoided.

According to the National Wetlands Inventory (USFWS 2014a), wetland complexes vary widely in the project area and occur primarily along intermittent and perennial streams (See Figures 2 through 9). The wetlands and associated streams in the project area are as follows:

- **Airport.** Approximately 1.2 acres of freshwater emergent wetlands, 1.3 acres of freshwater ponds, and 0.7 acre of riverine wetlands. These areas are associated primarily with a tributary to Dry River.
- **Grizzly.** Approximately 0.4 acre of freshwater emergent wetlands, 1.2 acres of freshwater forested/shrub wetlands, 0.3 acre of freshwater ponds, and 2.8 acres of riverine wetlands. These areas are associated primarily with tributaries to Lytle Creek.
- **Juniper Canyon.** Approximately 2.0 acres of freshwater emergent wetlands, 1.6 acres of freshwater ponds, and 6.5 acres of riverine wetlands. These areas are associated primarily with tributaries to Dry Creek.
- **Marks Creek.** Approximately 3.2 acres of freshwater emergent wetlands, 0.1 acre of freshwater ponds, and 2.1 acres of riverine wetlands. These areas are associated primarily with Marks Creek.
- **Millican Road.** Approximately 3.2 acres of freshwater emergent wetlands, 0.2 acre of freshwater ponds, and 7.1 acres of riverine wetlands. These areas are associated primarily with Marks Creek.
- **Ochoco Reservoir**. Approximately 9.7 acres of freshwater emergent wetlands, 1.5 acres of freshwater forested/shrub wetlands, 0.3 acre of freshwater ponds, and 2.8 acres of riverine wetlands. These areas are associated primarily with Johnson Creek and Mill Creek.
- **Powell Butte 1**. Approximately 1.1 acres of freshwater emergent wetlands, 1.6 acres of freshwater ponds, and 0.6 acres of riverine wetlands. These areas are primarily associated with tributaries to Dry River.
- **Powell Butte 2**. Contains no wetland complexes.

4.2.5 Floodplains

EO 11988, Floodplain Management, requires Federal agencies to avoid, to the extent possible, the long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative.

The Flood Insurance Rate Maps for the project area, Panels 41013C0250C, 41013C0450C, 41013C0200C, 41013C0375C, 41013C0384C, 41013C0385C, 41013C0400C, 41013C0410C, 41013C0411C, 41013C0415C, 41013C0436C, 41013C0440C, 41013C0675C, 41013C0700C, 41013C0725C, 41013C0750C (FEMA 2012), show floodplains associated with Crook River, Dry Creek, Dry River, Johnson Creek, Lytle Creek, Mill Creek, and Polly Creek that are designated Zone A, which is subject to inundation by the 1-percent-annual-chance flood event (100-year floodplain). Portions of the floodplains in the Grizzly, Juniper Canyon, Ochoco Reservoir, and Powell Butte 2 project area communities are developed with residential structures. The hillsides surrounding the streams are characterized by relatively flat to steep slopes, resulting in narrow to wide floodplains that are between 200 and 1,400 feet wide.

Major flooding has occurred in Crook River and Ochoco Creek. According to the *Prineville/Crook County Natural Hazards Mitigation Plan*, severe flooding occurred along these rivers in 1904, 1918, 1951, 1952, 1955, 1956, and 1998. A hazard analysis matrix that considered history, vulnerability, maximum threat, and probability determined that flooding was the highest overall hazard risk in the County (Crook County 2010).

4.2.6 Consequences of Alternatives

No Action Alternative

Under the No Action Alternative, FEMA would not provide funding to reduce vegetation around residences, however, some wildfire mitigation activities would be expected to continue as initiated by property owners, through existing local programs and requirements, or as required by homeowners insurance providers. Thus, existing conditions and risks to water resources would not change. Properties with maintained defensible space would be expected to be less vulnerable to catastrophic wildfires and thus less likely to contribute to post-burn erosion and sedimentation of surface waters, to the Wild and Scenic River reach of the Crooked River, and to wetlands. In the event of a wildfire, impacts to the water quality, including sedimentation, of surface water, the Crooked Wild and Scenic River, and wetlands would be minor to moderate, depending on the size and intensity of the fire and subsequent erosion due to the loss of vegetation. A significant loss of mature vegetation along steep slopes can increase the risk of landslides into surface waters, wetlands, and floodplains and change local hydrologic and hydraulic conditions.

Proposed Action

Local, short-term minor impacts to surface water from sedimentation during vegetation removal could occur. To minimize impacts, vegetation management activities would be restricted within riparian management areas between 10 to 100 feet from a stream's OHWM (ODF 2014, OAR 629-635).

Riparian management area restrictions would include retaining understory vegetation within 10 feet of the OHWM, trees within 20 feet of the OHWM, all trees leaning over a channel, and all downed wood and snags (ODF 2014, OAR 629-640). These restrictions would minimize the release of sediments by limiting ground-disturbing activities near streams. Project area specific stream buffers would be established during the initial site assessment for property owner participants.

Long-term minor adverse impacts to water quality, including dissolved oxygen and temperature, could occur but would be minimized by adhering to the stream buffers described above. As noted in Section 4.2.3, ODEQ considers Marks Creek and Mill Creek to be below water quality standards for temperature near the project area. However, project activities are not anticipated to further degrade water quality.

Potential adverse impacts to the Wild and Scenic River reach of the Crooked River are not anticipated because of adherence to the above discussed stream buffers on tributaries to the river and as a result of project activities being relatively distant from the designated reach.

Most riparian wetlands would be avoided by restricting work within riparian management areas. If these work-restriction buffers are not followed, there would be the potential for minor to moderate adverse impacts, depending on the intensity of fuels reduction activities.

Impacts on floodplains are not anticipated. The stream buffers described above would be required. The Proposed Action would not increase flood elevations or velocities because modifications to banks would not occur and land in the floodplain would not be built up. If work is not restricted in the stream buffers, there would be potential for localized minor to moderate adverse impacts, depending on the intensity of fuels reduction activities. Vegetation removal in the WUI would not promote floodplain occupancy.

In the long term, the mitigated properties that maintain defensible space would be expected to be less vulnerable to catastrophic wildfires and thus less likely to contribute to post-burn erosion and sedimentation of water resources. Thus, depending on the scale of participation and how contiguous the mitigated properties are, the Proposed Action is expected to have a minor positive effect on water resources from the reduced wildfire vulnerabilities in treated locations.

4.3 BIOLOGICAL RESOURCES

4.3.1 Vegetation

Vegetation in the County varies from forested, mountainous terrain in the Ochoco Mountains and Maury Mountains to the north and high desert to the south.

Oregon vegetation data from the Northwest Habitat Institute were used to assess vegetation communities in the County and project area (NWHI 2000). Predominant forest species in mountainous areas include ponderosa pine and mixed conifer forest. Western juniper, shrubland, and sagebrush steppe are common in the southern portion of the County in the high desert prairie. Agriculture is common along Crook River and Ochoco Creek and in the Prineville Valley. Agricultural crops include wheat and forage land (USDA 2012). The project area is generally in the high desert prairie and largely composed of western juniper woodland and big sagebrush shrubland. Invasive non-native plants are also present in the project area, especially along streams and roads.

The vegetation in each community is as follows:

- **Airport**. Predominantly western juniper woodland and big sagebrush shrubland. Agriculture is also common along the Peoples Irrigation Company Ditch and a tributary of Dry River.
- **Grizzly.** Predominantly western juniper woodland and big sagebrush shrubland and also scattered ponderosa pine. Agriculture is also common along tributaries of Lytle Creek.
- **Juniper Canyon.** Predominantly western juniper woodland and big sagebrush shrubland and also scattered ponderosa pine and agriculture.
- **Marks Creek.** Predominantly mixed conifer forest and ponderosa pine.
- **Millican Road.** Predominantly western juniper woodland and big sagebrush shrubland.
- **Ochoco Reservoir.** Predominantly western juniper woodland and big sagebrush shrubland and also scattered ponderosa pine. Agriculture is also common along tributaries of Ochoco Creek and Mill Creek.
- **Powell Butte 1.** Predominantly western juniper woodland and big sagebrush shrubland. Agriculture is also common along the Peoples Irrigation Company Ditch and a tributary of Dry River.
- **Powell Butte 2.** Predominantly western juniper woodland and big sagebrush shrubland.

The overgrowth of trees, forest floor fuels, and an abundance of dead or dying vegetation in the project area contribute to a substantially elevated risk of wildland fires that is difficult to control.

4.3.2 Wildlife and Fish

The U.S. Fish and Wildlife Service (USFWS) Office of Migratory Bird Management maintains a list of migratory birds (50 CFR § 10.13).

The Migratory Bird Treaty Act of 1918 (MBTA), as amended (16 U.S.C. §§ 703–711), provides Federal protections for migratory birds and their nests, eggs, and body parts from harm, sale, or other injurious actions. The act includes a "no take" provision.

Common MBTA bird species in this region include black-headed grosbeak (*Pheucticus melanocephalus*), Cassin's finch (*Carpodacus cassinii*), common raven (*Corvus corax*), pygmy nuthatch (*Sitta pygmaea*), pinyon jay (*Gymnorhinus cyanocephalus*), Williamson's sapsucker (*Sphyrapicus thyroideus*), brewer's sparrow (*Spizella breweri*), calliope hummingbird (*Stellula calliope*), and American goldfinch (*Spinus tristis*).

A more extensive list of the MBTA species common in Crook County is provided in Appendix D. Eastern Oregon is part of the Pacific Flyway, and open water areas such as Prineville Reservoir and Ochoco Reservoir are considered a stopover location for avian species. Ducks, geese, herons, egrets, grebes, and other water-loving birds congregate in the open water areas of Crook County. The nesting season for migratory birds is generally from April 15 through July 31, depending on species and location (City of Portland 2010).

Resident mammals include such species as coyote (*Canis latrans)*, pronghorn (*Antilocapra americana*), mule deer (*Odocoileus hemionus*), bobcat (*Lynx rufus*), raccoon (*Procyon lotor*), porcupine (*Erethizon dorsatum*), deer mouse (*Peromyscus maniculatus*), bushy-tailed woodrat (*Neotoma cinerea*), voles (*Microtus* spp.), yellow-pine chipmunk (*Tamias amoenus*), and Douglas squirrel (*Tamiascirurus douglasii*) (Eder 2002).

Typical reptiles in the project area may include such species as western fence lizard (*Sceloporus occidentalis*), western skink (*Eumeces skiltonianus*), gopher snake (*Pituophis catenifer*), and garter snake (*Thamnophis* sp.). Amphibians may include bullfrog (*Rana catesbeiana*), Pacific treefrog (*Pseudacris regilla*), and Great Basin spadefoot (*Spea intermontana*).

Common fish species found in the upper Crooked River and its tributaries include brook trout (*Salvelinus fontinalis*), brown trout (*Salmo trutta*), largemouth bass (*Micropterus salmoides*), smallmouth bass (*Micropterus dolomieu*), dace species (*Rhinichthys* sp.), northern pikeminnow (*Ptchocheilus oregonensis*), and black crappie (*Pomoxis nigromaculatus*) (ODFW 2014).

4.3.3 Threatened and Endangered Species and Critical Habitat

The Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. §§ 1531–1544), was established to conserve, protect, and restore threatened and endangered species and their habitats. Section 7 of the ESA (16 U.S.C. § 1536) requires Federal agencies to ensure that their actions do not jeopardize the continued existence of listed species and do not result in adverse modification to designated critical habitat.

The USFWS and National Oceanic and Atmospheric Administration fisheries databases identified four threatened and endangered species with potential to occur in the project area (USFWS 2014b). They are bull trout (*Salvelinus confluentus*), Canada lynx (*Lynx canadensis*), gray wolf (*Canis lupus*), and steelhead (*Oncorhynchus mykiss*). The four species are discussed in more detail below.

Bull Trout

The USFWS issued a final rule listing for the bull trout in the coterminous United States as a threatened species on November 1, 1999 (USFWS 1999). A revised draft recovery plan for the species was released in 2014 (USFWS 2014c). On September 30, 2010, the USFWS designated critical habitat for bull trout throughout its U.S. range (USFWS 2010).

Bull trout have stringent requirements for cold water and clean gravel to rear and reproduce, and spawning usually occurs in mountain streams fed by snow-melt or springs fed by snow fields (Goetz et al. 2004). The habitat components required by bull trout are often summed up by the “Four C’s”: cold, clean, complex, and connected. Bull trout exhibit patchy distributions because even under pristine conditions, the required habitat components are not ubiquitous throughout river basins.

Bull trout in Crook County are part of the Deschutes River population. Spawning and juvenile rearing distribution is thought to occur in the lower reaches of the Crooked River up to the Opal Springs Dam, which is well below (downstream) of any of the project sites. The Opal Springs Dam is in the planning stages of a project to allow fish passage, but it has not been implemented (DVWD 2011). Current distribution of bull trout in Crook County does not include any of the project area (ODFW 2003). Bull trout critical habitat does not occur in Crook County.

Gray Wolf

The gray wolf was listed as endangered on March 9, 1978. This species is federally listed in the western two-thirds of the State of Oregon (west of U.S. Highway 395 and State Routes 78 and 95). Gray wolves are generalists that use a broad spectrum of elevations and habitats. They typically avoid areas with greater than 1 mile of road per square mile, primarily because of the increased human presence in those areas (Thiel 1985; Wisdom et al. 2000). However, they may inhabit areas with greater road densities if these habitats are adjacent to relatively roadless areas (Mech 1970). In Oregon, the gray wolves are concentrated in the northeastern corner of the State. There are no known wolf packs in Crook County (ODFW 2014). Although gray wolf occur over a wide area and are expanding their range in Oregon, none are known to occur in Crook County.

Steelhead

The middle Columbia River steelhead Distinct Population Segment (DPS) was listed as threatened under the Federal ESA on March 25, 1999 (NMFS/NOAA 1999), and critical habitat was designated on September 2, 2005 (NMFS/NOAA 2005). A Conservation and Recovery Plan for the Oregon steelhead population was published in 2009 (Carmichael and Taylor 2009).

Steelhead exhibit the most complex life history of any species of Pacific salmonid. Steelhead can be anadromous (referred to as steelhead) or freshwater residents (referred to as rainbow trout or redband trout). The Middle Columbia River steelhead DPS include 10 current and three historical populations in Oregon (Carmichael and Taylor 2009). The project area occurs within the historical Crooked River population area. The Crooked River population is considered extirpated because of a long-standing impassible fish barrier. Therefore, no steelhead have the potential to occur in the project area.

The Marks Creek community is approximately 4 miles southwest of the nearest designated critical habitat. That critical habitat is part of the John Day River population area (drains to the north), whereas Marks Creek is part of the Crooked River population, which is considered extirpated (drains to the southwest) (Carmichael and Taylor 2009).

4.3.4 Other Special-Status Species

One species that is a candidate for listing under the ESA has some potential to occur in Crook County. It is the greater sage-grouse (*Centrocercus urophasianus*). Greater sage-grouse is not known to occur in forested habitat, which is the primary habitat type in the project area (ORBIC 2014). Candidate species are those that have been petitioned and are actively being considered for listing as endangered or threatened under the ESA. Candidate species are afforded no protection under the ESA.

Data from the Oregon Biodiversity Information Center (ORBIC) were queried for other known special-status species in and near the project area (ORBIC 2014). The resulting data show that Oregon State Vulnerable species Inland Columbia Basin redband trout (*Oncorhynchus mykiss gairdneri*) occurs in the Marks Creek community. A historical record (1894) for disappearing monkeyflower occurs in the Grizzly community; this is an Oregon State Candidate for listing.

The Bald and Golden Eagle Protection Act (16 U.S.C. §§ 668-668c) prohibits the taking of either species, including their parts, nests, or eggs. Bald eagles are abundant in the Crook County, but none are known to occur within or immediately adjacent (660 feet) to project sites (ORBIC 2014). Golden eagle is also a relatively abundant resident of Crook County. Numerous recent records (2011through 2013) of golden eagle observations occur in Crook County (ORBIC 2014). One golden eagle nest occurs within 0.5 mile of the Airport community and was active as recently as 2014 (USFWS 2014d).

4.3.5 Consequences of Alternatives

No Action Alternative

Under the No Action Alternative, vegetation management activities would not be funded; however, some wildfire mitigation activities would be expected to continue as initiated by property owners, through existing local programs and requirements, or as required by homeowners insurance providers. The existing high risk of vegetation loss from catastrophic wildfires would continue, as would vulnerabilities to biological resources (e.g., wildlife and fish).

Vegetation management activities could cause minor localized and temporary disturbance to wildlife, including ESA-listed species. There would be human activity or noise associated with chainsaws, chippers, brush mowers, and masticators. Future uncontrolled wildfires, especially catastrophic fires, could affect wildlife through the loss of habitat or the mortality of individuals. These impacts to biological resources could be minor to moderate, depending on the severity and location of the wildfires.

Proposed Action

Vegetation

As defensible spaces are established and maintained as part of the Proposed Action, various disturbances from work crews, removal of individual small trees and brush, and hand pruning or limbing may result in local, indirect, and minor adverse effects on native plant communities. Examples of the types of vegetation to be treated are ponderosa pines, Douglas firs, lodgepole pines, junipers, sagebrush, bitterbrush, and invasive species. However, many of the properties have non-native ornamental or weedy species in the potential treatment areas. Trimming or removing these plants would not negatively affect native plant communities. Because these activities involve negligible ground-disturbance and would be done mostly by hand, the potential is low that new invasive plant species populations would become established or that existing populations would expand as a result of the Proposed Action.

Wildlife, Fish, and Threatened and Endangered Species

Wildfire fuel-reduction activities to establish the defensible spaces could have minor, localized, and scattered impacts on wildlife through habitat modification. Various factors, including changes in food sources, shelter, population density, and dispersal effort, would determine the severity of impacts to non-listed wildlife. Adverse effects from maintenance of defensible spaces would be negligible.

No permanent conversion of forested habitat to other types of habitat is anticipated as part of the Proposed Action.

The project area would remain as upland forest habitat, and wildlife habitat would in general remain intact. The Proposed Action would focus only on limited thinning of existing forest and removing biomass near structures.

Temporary disturbance to wildlife could occur from the physical presence of workers and by noise generated from the equipment used (e.g., chainsaws, chippers, brush mowers, masticators). The disturbance is anticipated to be of short duration (no more than a few days) on each property during the first year. The disturbance could result in temporary avoidance of the area by wildlife. Additional disturbance may occur once a year for the 5-year maintenance period. Impacts on wildlife from the temporary disturbance are considered minor because of the short duration of work on any given parcel. Impacts are also considered minor because the most intense treatment would occur within a limited radius of existing homes and structures where localized human activity already occurs.

Work that occurs during the summer bird breeding season (generally mid-April through late-July) may have minor impacts on nesting birds and birds protected under the MBTA. The disturbance could result in abandonment of nesting efforts or displacement from preferred foraging areas, which would affect ground-nesting and shrub-nesting birds to a greater extent than birds that nest in the upper canopy of trees. Cavity-nesting birds such as woodpeckers and nuthatches may be disproportionally affected because of the emphasis on removal of dead or dying trees (snags). To minimize the potential for migratory bird effects, initial treatment activities will be precluded during the nesting season, unless a project site survey determines there would be no migratory birds affected by treatment activities. Small mammals and reptiles may lose some habitat as a result of the removal of downed wood.

The Proposed Action would benefit wildlife habitat and species in the long term by reducing the risk of catastrophic loss from future wildfires, in terms of habitat degradation and mortality.

There would be no impact to ESA-listed species (e.g., bull trout, Canada lynx, gray wolf, steelhead) because there are no ESA-listed species present in or near project are communities. There would also be no impact to designated critical habitat or to any other sensitive wildlife species.

There would be no known impacts to any bald eagle nests as a result of the project. Impacts to one golden eagle nest would be avoided by placing a seasonal restriction on a portion of the Airport community (Appendix A, Figure 2). Work would be prohibited during the January 15 through August 30 nesting season annually, unless surveys described in Section 6 determine work during the nesting season would not result in disturbance or “take.”

4.4 CULTURAL RESOURCES

Cultural resources consist of locations of human activity, occupation, or use identified through field inventory, historical documentation, or oral evidence. The term encompasses historic properties as defined by the National Register of Historic Places (NRHP), including archaeological and architectural properties as well as sites or places of traditional cultural or religious importance to Native American Tribes or other social or cultural groups.

Section 106 of the National Historic Preservation Act of 1966 (NHPA), as amended (16 U.S.C. § 470f), requires that activities needing Federal permits or using Federal funds undergo a review process to consider historic properties that are listed in or may be eligible for listing in the NRHP. The State Historic Preservation Officer (SHPO) is the Federal agency's primary Section 106 partner. Because Section 106 is a process by which the Federal Government assesses the effects of its undertakings on historic properties, it is the primary regulatory framework used in the NEPA process to determine impacts on cultural resources.

In accordance with Section 106, FEMA has delineated that the Area of Potential Effects (APE) for the project area, which consists of a total of approximately 11,633 acres and about 4,357 lots in the eight communities (Airport, Grizzly, Juniper Canyon, Marks Creek, Millican Road, Ochoco Reservoir, Powell Butte 1, and Powell Butte 2) See Appendix A, Figures 1 through 9 and Table 1-1).

4.4.1 Ethnographic and Historical Context

Ethnographic Period

During the ethnographic period, the project area was within the traditional territory used primarily by the Hunipuitöka or Walapapi band of the Northern Paiute people (Stewart 1939). The Numic-speaking Northern Paiute occupied much of the Great Basin in southeastern Oregon and northwestern Nevada. The Hunipuitöka or Walapapi band inhabited portions of central Oregon along the Deschutes, Crooked, and John Day Rivers (Jette 2004). The territories of the Paiute bands were in considerable flux during the mid- to late-19th century. Other Paiute bands, such as the Wadatöka, may have also moved into the project area during this period (Fowler and Liljeblad 1986).

The Northern Paiute practiced a seasonal subsistence and settlement system, allowing the bands to move to the resources as they became available. They hunted large and small game, fished, and gathered approximately 150 different species of seeds, roots, berries, and other plant resources. In early May, households left their winter villages and gathered at root grounds and salmon streams and also dispersed to the uplands to hunt game and gather roots and seeds. In mid-July, families congregated to gather crickets and then dispersed for the remaining summer to hunt game and gather seeds and berries.

In early fall, families assembled to harvest waada seeds and for cooperative antelope and rabbit drives. Communal socializing and festivities occurred during this period. By early November, families collected their stored foods and settled into their winter villages.

Winter villages and temporary seasonal camps were composed primarily of conical lodges. These were small lodges, constructed of willow frames overlaid with tule mats or grass coverings, which accommodated a single nuclear family. These structures were usually surface features that could be disassembled and moved to new locations during the subsistence round. Other temporary structures were composed of juniper trees and used as wind breaks and shelters (Lebow et al. 1990).

The primary socio-cultural units within each band were the individual households or camps, and political control mostly resided in the family. Local camp groups also had headmen who served in an advisory role (Whiting 1950; Couture 1978).

The Northern Paiute were introduced to horses and other Euro-American goods at an early date through trade and contact with Spanish settlements in the American Southwest. In the early 1840s and 1850s, Euro-American emigrants began to move across the Great Basin and introduced cattle and other stock that adversely affected the resources used by the Paiute. The greatest effects were felt along the Californian Trail in Northern Nevada, which prompted the Nevada Paiute to move north into Oregon. In the 1860s and 1870s, a mining boom in Malheur Basin and the establishment of ranching led to hostilities between various Northern Paiute bands and the U.S. Army. Some of these bands also raided the Warms Spring Reservation, where the Wasco and Sahaptin groups had been resettled as a result of the 1855 Treaty. Following these hostilities, Northern Paiute bands were placed in the southern portion of the Warm Springs Reservation (Fowler and Liljeblad 1986; French et al. 1998).

The project area lies within the ceded lands of the Confederated Tribes of the Warm Springs under terms of the 1855 Treaty with the Tribes of Middle Oregon (Kappler 1904) and was in the traditional territory of the Northern Paiute groups. The project area was also used by other Native American groups, including the seasonal use by Sahaptin (Warm Springs) and Wasco bands from the Columbia River and lower Deschutes River areas, as well as the Nez Perce, Cayuse, and Klamaths (Pettigrew 1982; Lyman et al. 1983).

Historical Period

Crook County, located in the geographical center of Oregon, was formed out of a portion of Wasco County in 1882. Crook County was reduced in size twice—once in 1914 when the northwestern portion was split off to create Jefferson County and again in 1916 when the southwestern portion was removed to create Deschutes County. Approximately half of Crook County is in Federal ownership, primarily by the BLM and the USFS.

1825-1866 Exploration and Contact

As with many parts of Oregon, the first Euro-Americans to visit Crook County were fur trappers from the Hudson's Bay Company led by Peter Skene Ogden in 1825. The trappers passed through the area and trapped along the way but did not establish any permanent settlements. Euro-American settlement in Oregon occurred in two waves. The first wave of immigrants followed the Oregon Trail west and settled in the rich agricultural lands of the Willamette Valley. Once most of the prime farmland was settled, cattle and sheep ranchers started looking to the eastern side of the Cascade Range where grazing land was abundant (CCHS 1981).

During this early period of exploration and contact, there were increasing tensions between the Native Americans and the Euro-Americans who were pushing to gain control over the lands. The U.S. Government entered into a number of treaties with tribes and established military camps to protect settlers. When gold was discovered in Canyon City near John Day in 1861, the eastward migration from the Willamette Valley to central Oregon increased. Migrants included both prospectors who hoped to strike it rich as well as ranchers and entrepreneurs who planned to profit from outfitting the prospectors (CCHS 1981).

1867–1902 Settlement and Land Acquisition

One of the barriers to settlement of Crook County was the lack of good transportation. The nearest large river is the Deschutes River, which runs north to the Columbia River. Although many stretches of the Deschutes are navigable, the river is in a deep, steep-walled canyon for much of its length. The canyon made access to and from the river very difficult and also created a barrier for east-west travelers. The Cascade Mountains were another barrier to settlement until routes over the passes were improved and made suitable for wagons. The Santiam Wagon Road over Santiam Pass opened in 1866 and provided the first good link between the Willamette Valley and the Deschutes River Basin (Ferguson et al. 2009). Farther south, the McKenzie Salt Springs and Deschutes Wagon Road, a predecessor to the McKenzie Highway, was opened in 1872 (Chapman 2011).

The first permanent settlers in Crook County were Elisha Barnes, George Barnes, Ewen Johnson, Edward White, Billy Smith, David Wayne Claypool, and Raymond Burkhart, who settled in the Ochoco Valley about 7 miles east of the present-day Prineville in 1867 (Lent 2013). These men had been neighbors in the Willamette Valley and moved east on the advice of Elisha Barnes to raise cattle. They encountered challenges with the native people and some chose to move back to Linn County, but more settlers arrived in the Ochoco Valley the following year and Prineville was founded shortly thereafter. The ranges in Crook County were found to be excellent for stock raising, and the number of sheep and cattle ranchers increased steadily. The Blue Mountain Range provided ideal summer range for sheep and cattle grazing, while the bunchgrass on the lower elevations was usually sufficient to get the animals through the winter.

Early land acquisition in Crook County did not follow the tidy patterns expected when the 1862 Homestead Act was passed. A 160-acre allotment is not large enough for raising stock in arid lands such as Crook County. As a result, the early settlers used open ranges that were shared by everyone in the area (Baker 2007). During this settlement period, a small number of timber, mining, and livestock companies secured vast holdings by filing fraudulent claims or by paying employees to file claims and then acquiring those lands (Hodgson 1913). Although the concept of open rangeland worked when there were few settlers, problems arose in the 1880s and 1890s when overgrazing became a problem. Cattle ranchers blamed the sheep farmers for the overgrazing and formed the "Crook County Sheep-Shooting Association of Eastern Oregon" in 1896 (Hodgson 1913). The vigilantes associated with this and similar organizations threatened sheepherders and killed flocks of sheep that they believed were to blame for the overgrazing.

At the same time tensions were increasing between sheep and cattle ranchers, the Forest Reserve Act of 1891, Organic Act of 1897, and Forest Transfer Act of 1905 established forest reserves and provided a mechanism for the newly established Forest Service to manage these lands (Atwood et al. 2005). The Forest Service used the powers to propose withdrawing most of the Blue Mountain region from entry under the Public Land Laws in 1902 and establish the lands as a Forest Reserve. The Maury Mountains, an independent spur of the Blue Mountains, was withdrawn in 1903. The Forest Service modified the administrative boundaries of the reserve lands and in 1911 designated the Ochoco National Forest, which is now located along the northern portion of Crook County and also includes the Maury Mountains. In managing the prime summer grazing lands, the Forest Service issued grazing permits and collected fees from ranchers for the use of the land. This management helped to reduce tensions between ranchers.

1903–1942 Industrialization

In addition to being a source of high-quality grazing land, the Ochoco Mountains were also a source of timber. Small-scale sawmills and timber harvests existed in Crook County in the 19th century, but they primarily served the local area because transportation was so challenging. In 1911, a railroad connected The Dalles to Bend, but this railroad did not serve Prineville. Lacking railroad investors, the City of Prineville decided to build its own railroad to Bend with the hope that economic development would ensue, as it had in Bend. The railroad was completed in 1918 and was used to move passengers and agricultural products, but it never provided the economic boom that city leaders had hoped for (CCHS 1981).

Until the 1930s, Prineville was mainly a ranching town, serving the area's rural population. Between 1936 and 1939, five lumber companies began milling pine lumber in Prineville and turned it into a mill town (Atwood et al. 2005).

Approximately half of Crook County's land is owned by the Federal Government and is evenly split between the BLM and the USFS. During the Great Depression, Franklin D. Roosevelt established the Civilian Conservation Corps (CCC) with the dual purpose of providing financial relief for the unemployed and conservation measures for public lands (Atwood et al. 2005). Crook County benefitted from the CCC on both BLM and USFS lands. CCC labor was used for range improvement projects such as fencing on public lands. CCC labor was also used to build ranger station buildings in Paulina in 1941.

1918–1961 Irrigation

Early settlers to Crook County homesteaded near streams and dug small irrigation ditches to provide water to their crops because of the low rainfall. As the area became more populated and as State and Federal irrigation regulations were passed, larger irrigation projects were developed. The projects were first undertaken by private irrigation companies, such as the Table Land Ditch Company in Prineville (Morgan et al. 1999) and later by irrigation districts.

The Ochoco Irrigation District (OID), the successor to the Table Land Ditch Company, built the Ochoco Dam between 1918 and 1921 to provide irrigation water for 22,000 acres (CCHS 1981). The dam was considered unsafe in 1947 so the OID reconstructed it in 1948 and increased its capacity for future irrigation (Kasberger 2010). The Prineville Dam was built between 1958 and 1961.

Principal crops benefitting from the irrigation include grain, hay, pasture, garlic, carrot seed, and mint. The Prineville Reservoir also provides recreational facilities for camping, picnicking, fishing, swimming, and boating.

1943–1965 Modernization

Crook County's timber industry rose and fell with the economy; during World War II and the post-war construction boom, the county's sawmills were very profitable, but the profitability began to taper in the 1960s. Les Schwab Tires was founded in Prineville in 1952 and became an increasingly important part of the town's economy (CCHS 1981).

4.4.2 Identification of Historic Properties

The identification of historic properties was completed by URS Group, Inc. (URS) archaeologists Anisa Becker, M.A., and Stephanie Butler, M.A., and URS architectural historian Martha Richards, M.A., who meet the Secretary of the Interior's Professional Qualification Standards for their disciplines. Analysis was based on the review of information from digital photographs, readily available materials collected during a desktop review, and a confidential search of the Oregon SHPO Archaeological Database and the Oregon Historic Sites Database. The records search was conducted in August and September 2014 to determine the presence or absence of previously recorded properties and the extent of survey coverage in and near the APE.

Aboveground Historical Resources

The Oregon SHPO database includes 91 resources listed in Crook County, with most of the historic resources located in the City of Prineville or Paulina. Historic resources identified in Paulina were recorded in 2008 as part of the Rager Ranger Station Survey and Inventory Project. In the City of Prineville, historic resources were documented as part of small individual surveys or are not associated with a report. According to the SHPO, Crook County has not been comprehensively surveyed, and it does not appear to have been part of the Statewide Comprehensive Survey. The SHPO indicated that the County may have been part of the 1976 Goal Five Planning Initiative in which counties were surveyed; however, the SHPO does not have documentation of a survey. USGS topographic maps and aerial photographs show that there are a number of buildings within the project APE, and it is likely that a field survey of the project area would reveal additional historic resources that were not previously recorded.

The results of the records search for the eight communities are as follows:

- **Airport.** One previously documented historic property. The property is located at 4520 NW O'Neil Highway and consists of a single-story house. The property is considered not eligible/non-contributing. No other information is provided for the resource.
- **Chiloquin, Grizzly, Juniper Canyon, Marks Creek, Millican Road, Ochoco Reservoir, Powell Butte 1, and Powell Butte 2**. No previously documented aboveground historic resources.

Archaeological Resources

Documented archaeological resources in the project area are as follows:

- **Airport.** One archaeological resource is potentially eligible for listing in the NRHP and is found in the western portion of the Airport community.
- **Grizzly**. One archaeological resource is potentially eligible for listing in the NRHP and is found in the southwestern portion of the project area.
- **Juniper Canyon**. Three archaeological resources are recommended as potentially eligible for listing in the NRHP and are situated in the central and western portion of the Juniper Canyon community. Four resources are recommended as ineligible for listing in the NRHP and are found in the southeastern portion of the community.
- **Ochoco Reservoir.** Eleven archaeological resources are potentially eligible for listing in the NRHP and are situated in the southern and eastern portion of the community. Two resources are recommended as ineligible for listing in the NRHP and are found in the southern portion of the community.
- **Marks Creek, Millican Road, Powell Butte 1, and Powell Butte 2**. No archaeological resources have been documented.

4.4.3 Summary of Documented Cultural Resources

Cultural resources found within the project area are listed in Table 4-2. Twenty-two archaeological resources, consisting of two historic-period sites (including homestead/ranching features and a dump), 14 precontact sites (including lithic scatters and a stacked rock feature), and six precontact isolates are found in the APE. All archaeological sites are considered potentially eligible for listing in the NRHP, and isolated finds are considered ineligible for the listing in the NRHP. In addition, one aboveground historic resource, a single-story house along NW O'Neil Highway, is also present in the APE; the resource is recommended as ineligible for listing in the NRHP.

Table 4-2: Previously Documented Cultural Resources within the Project Area

Site/Isolate No.	Description	Eligibility	Community
35CR19	Lithic scatter of obsidian and CCS flakes. Site area measures 50-x-30 meters.	Unevaluated	Ochoco Reservoir
35CR20	Lithic scatter of obsidian and CCS flakes. Site area measures 130 meters long by indefinite meter wide.	Unevaluated	Ochoco Reservoir
35CR21	Lithic scatter of obsidian and CCS flakes. Site area measures 130 meters long by indefinite meters wide.	Unevaluated	Ochoco Reservoir
35CR189	Lithic scatter of 80 obsidian flakes. Site area measures 50-x-30 meters.	Unevaluated	Juniper Canyon
35CR190	Lithic scatter of 30 obsidian flakes. Site area measures 20-x-15 meters.	Unevaluated	Juniper Canyon
35CR379	Lithic scatter of over 60 CCS and obsidian flakes and tools. Site area measures 34-x-11 meters.	Unevaluated	Juniper Canyon
35CR713	Lithic scatter consists of CCS chunks, flakes, edge-ground cobbles, and two projectile points. Site area measures 5,695 square meters².	Unevaluated	Ochoco Reservoir
35CR714	Lithic scatter consists of flakes, cores, edge-ground cobble, and modified flakes. Material includes CCS, rhyolite, basalt, and obsidian. Site area measures 2,013 square meters².	Unevaluated	Ochoco Reservoir
35CR715	Lithic scatter consists of obsidian and CCS flakes, unifacial scrapers, biface, modified flake, end-battered cobble. Site area measures 518 square meters².	Unevaluated	Ochoco Reservoir
35CR716	Lithic scatter consists of CCS, obsidian, and basalt flakes and one CCS biface. Site area measures 2,920 square meters².	Unevaluated	Ochoco Reservoir
35CR717	Lithic scatter consists of flakes, one projectile point, one biface, one scraper, and shatter. Material includes CCS, rhyolite, and obsidian. Site area measures 2,580 square meters².	Unevaluated	Ochoco Reservoir

Table 4-2: Previously Documented Cultural Resources within the Project Area

Site/Isolate No.	Description	Eligibility	Community
35CR718	Lithic scatter consists of 70 CCS flakes, one edge modified flake, and biface fragment. Site area measures 17,050 square meters².	Unevaluated	Ochoco Reservoir
35CR719	Lithic scatter consists of 50 CCS and obsidian flakes, and one obsidian biface fragment. Site area measures 6,000 square meters².	Unevaluated	Ochoco Reservoir
35CR1174	Five cobble features comprised of boulders - probably the remains of a homestead/ranch. Site area is 3,142 square meters².	Unevaluated	Ochoco Reservoir
35CR1592	Cairn and lithic material consisting of 4-meter circular mound of stacked basalt rock and a CCS biface and flake. Site area measures 58-x-30 meters.	Unevaluated	Grizzly Mountain
OLP-ISO-1	Two obsidian flakes and one CCS flake.	Not Eligible	Ochoco Reservoir
OLP-ISO-2	One obsidian flake, one CCS flake, and one piece of CCS shatter.	Not Eligible	Ochoco Reservoir
B-19	Five obsidian flakes and one CCS flake.	Not Eligible	Juniper Canyon
B-20	Ten obsidian flakes and one CCS projectile point.	Unevaluated	Juniper Canyon
B-34	Two obsidian flakes.	Not Eligible	Juniper Canyon
IF2	Three CCS flakes and one biface fragment.	Not Eligible	Juniper Canyon
Le's Map: Dump	"Dump"	Unevaluated	Airport

CCS = cryptocrystalline silicate

Previously documented cultural resources are rare, primarily because the lands within the project area are largely privately held or Federal or County-owned and have not been inventoried. Areas that have been surveyed have identified a variety of precontact and historic-period cultural resources. Because the areas that have been inventoried have identified historic and precontact archaeological sites, similar resources would be expected to occur within areas that have never been inventoried for cultural resources. Each of the eight project area communities is likely to have evidence for precontact use given the large areal extent of the project and the variety of sensitive landforms present, such as streams, rock outcrops, ridges, and terraces. In addition, aboveground historic resources that were not previously recorded may be present within the project APE.

4.4.4 Consequences of Alternatives

No Action Alternative

Under the No Action Alternative, FEMA would not provide funding to reduce fuels in selected areas of Crook County; however, some wildfire mitigation activities would be expected to continue as initiated by property owners through existing local programs or

requirements or as required by homeowners insurance providers. Ground-disturbing activities associated with these activities would be limited. Thus, the potential to impact cultural resources is also expected to be limited. The archaeological sites and historic properties in the project area and others not yet identified would continue to be at risk to damage from wildfires.

Proposed Action

The Proposed Action would reduce fuels around residences and other structures in the eight project area communities in Crook County. Under the Proposed Action, fuels and other biomass would be removed by means of chainsaws, chippers, brush mowers, and masticators. Areas targeted for vegetation removal include at least a 30-foot radius around main residential structures. Landowners and contractors would conduct vegetation-removal activities by hand, including thinning and trimming. Vegetative debris would be chipped and spread onsite or piled, with some limited burning of piles, or disposed of at the Crook County Transfer Station in Prineville. Ground-disturbing activities with the potential to affect cultural resources associated with the project are therefore expected to be limited.

Aboveground Resources

According to the Oregon Historic Sites Database, one historic resource, a single-story house at the Airport community, is within the project APE. The resource is recommended as ineligible for listing in the NRHP, and thus the Proposed Action would have no effect to that structure. Moreover, because no work is proposed on structures, the potential to affect unidentified aboveground historic properties is negligible. Depending on the scale and location of treated properties, the Proposed Action could benefit unidentified historic buildings by reducing their vulnerability to wildfires.

Archaeological Resources

The Proposed Action would be implemented in areas generally considered to be archaeologically sensitive, where surface or deeply buried cultural resources could be present, as evidenced by 22 previously recorded archaeological resources within private and public lands in the APE. Because portions of the project area have not been previously surveyed, additional sites are likely present that have not yet been documented. These sites have not been evaluated for the NRHP and would be treated as potentially eligible.

Although direct impacts to previously documented archaeological sites are not anticipated, Crook County would be required to avoid these resources as a precaution to prevent even minor potential disturbances, such as pedestrian traffic or vegetation removal across a site. In addition to avoiding known sites, to reduce the potential for impacts to cultural resources, work would be conditioned to maximize all machinery vehicles to stay within existing roads on both public and private lands.

Tree limbs would be cut and hauled manually to the machinery staged on the roads. The proposed vegetation thinning and trimming around residential structures would have little potential to affect archaeological resources because of the proposed low-impact methods within a disturbed context. FEMA has determined that no additional identification or evaluation efforts are necessary and that the Proposed Action would have no effects on historic properties.

FEMA requires that all of its funded ground-disturbing projects protect cultural resources during site work. In the event of an unanticipated discovery—and in compliance with State and Federal laws protecting cultural resources, including Section 106—all work would be required to cease in the immediate vicinity of the find until the appropriate parties (including the SHPO) are consulted and an appropriate resolution plan is established.

FEMA provided these Section 106 findings and determinations in formal letters to the SHPO and the Confederated Tribes of Warm Springs, dated October 24, 2014.

4.5 SOCIOECONOMIC RESOURCES

4.5.1 Public Safety

Residential development in the WUI places communities at risk of a catastrophic wildfire and threatens public safety. Fire alerts, warnings, and evacuations are designed to prepare communities to be proactive in preventing wildfires and to respond immediately if an evacuation is declared. Wildfires can put homes directly at risk and also result in transportation and utility failures, flash flooding and mudslides, and air pollution concerns. Emergency responders typically coordinate with communities as wildfires approach and educate homeowners on how to protect their homes and evacuate safely. It is important for the public to stay informed about the current risk of wildfire in their community and discuss an evacuation plan with families and neighbors. Many local and State media resources (e.g., television, radio, newspaper, Internet), telephone numbers, local emergency response offices, and word-of-mouth inform the public on wildfire risk in their area.

4.5.2 Environmental Justice

EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, directs Federal agencies to identify and address, as appropriate, disproportionately high and adverse human health or environmental effects on minority and low-income populations resulting from Federal programs, policies, and activities. Socioeconomic and demographic data for residents in the project vicinity were studied to determine whether the Proposed Action would have disproportionate impacts on minority or low-income persons.

Data from the 2012 Census American Community Survey 5-year estimates for Crook County were used to identify the minority[1] and low-income[2] compositions of the project areas, which are in Census Tracts 9501, 9502, 9503, and 9504. In the project area, the minority population was approximately 6 percent and the poverty rate was approximately 17 percent (U.S. Census Bureau 2012). Because these levels are the same or lower than in Crook County as a whole, no detailed analysis for impacts to minority and low-income populations is required per EO 12898.

4.5.3 Consequences of Alternatives

No Action Alternative

Under the No Action Alternative, FEMA would not provide funding to reduce fuels; however, some wildfire mitigation activities would be expected to continue as initiated by property owners, through existing local programs and requirements, or as required by homeowners insurance providers. In the event of a wildfire, there would be an increased risk to public safety and emergency responders in these communities. Because the project area communities have high hazards (e.g., weather, topography, fuel) and moderate protection capabilities, an evacuation and emergency response in these communities could be challenging. Minority or low-income populations in the project area would not benefit along with the entire affected population from a reduction in wildfire risks.

Proposed Action

Properties with maintained defensible space would be expected to be less vulnerable to catastrophic wildfires. Reducing the risk or severity of wildfires would generally have a positive effect on public safety and emergency responders because of the consequent reduction in risk to structures, roads, utilities, and air pollution. The project area was chosen as a high priority for mitigation based solely on the need to protect residences from wildfires; demographics were not a factor in the decision. Furthermore, minority or low-income populations in the project area will benefit equally to the entire affected population from a reduction in wildfire risks.

[1] A minority is "a person who is: (1) Black (a person having origins in any of the black racial groups of Africa); (2) Hispanic (a person of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race); (3) Asian American (a person having origins in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent, or the Pacific Islands); or (4) American Indian and Alaskan Native (a person having origins in any of the original people of North America and who maintains cultural identification through Tribal affiliation or community recognition)" (U.S. Census Bureau 2014).

[2] A person with low income is identified as "one whose median household income is at or below the Department of Health and Human Services poverty guidelines" (USHHS 2013). Income data based on Department of Health and Human Services guidelines are difficult to gather, so U.S. Census Bureau data are often used for environmental justice analyses.

4.6 RECREATION

Crook County is home to many recreational activities (e.g., fishing, hiking, horseback riding, kayaking, boating, biking, birding, hunting, golf). The following recreational areas are adjacent to or near the project area communities:

- **Ochoco National Forest**. This National Forest contains snoparks, trails, and the Ochoco Divide Campground near the Marks Creek project area (USFS 2014a).
- **BLM Prineville District.** Several campsites, day use areas, and hiking trails begin about 0.75 mile west from the Juniper Canyon project area and continue downstream surrounding the Prineville Reservoir (BLM 2014).
- **Ochoco Wayside State Park**. This State park is located east of the Airport community off Oregon Route 126. The park is used primarily for its walking trails and viewpoints of nearby Prineville (OPRD 2014).
- **Ochoco Lake State Park**. This State park is located on the southern end of the Ochoco Reservoir project area off U.S. Highway 26. The park contains 22 campsites and provides fishing and boating opportunities (OPRD 2014).
- **Prineville Reservoir State Park**. This State park is located on the southern end of the Juniper Canyon community. The park contains 20 campsites, 22 full hookup sites, 5 cabins, an amphitheater, fishing and boating opportunities, wildlife viewing, and hiking trails (OPRD 2014).
- **Meadow Lakes Golf Course**. This public golf course is located about 0.25 mile east of the Airport community. It is an 18-hole golf course and hosts many special events and leagues.
- **Library Park**. This City of Prineville park (managed by the Crook County Parks and recreation District) includes interpretive trails, a play area, picnic tables, and river access (CCPRD 2014). It is about 0.25 mile east of the Airport community on the eastern bank of Crooked River.

4.6.1 Consequences of Alternatives

No Action Alternative

Under the No Action Alternative, FEMA would not provide funding to reduce fuels; however, some wildfire mitigation activities would be expected to continue as initiated by property owners, through existing local programs and requirements, or as required by homeowners insurance providers. In the event of a wildfire, ingress and egress to recreational areas could be disrupted. Depending on the size and severity of the wildfire, portions of nearby forests or parks could be damaged or destroyed. Adverse impacts would range from minor to major.

Proposed Action

Project activities would directly avoid recreational areas because private property is targeted in residential areas, but they would occur just outside the boundaries of the Ochoco National Forest near the Marks Creek community. Vegetation removal activities would be coordinated with managing agencies, as required. Thinning and limbing of trees and shrubs is not anticipated to adversely affect recreational activities or viewpoints. Depending on the location and size of treated properties, the Proposed Action could provide some minor benefits to recreational areas by complementing wildfire mitigation that occur within them and help reduce the spread of wildfires.

4.7 CUMULATIVE IMPACTS

CEQ regulations for implementing NEPA require an assessment of cumulative effects during the decision-making process for Federal projects. Cumulative effects are defined as:

> … the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions (40 CFR § 1508.7).

Cumulative effects were determined by combining the effects of these alternatives with other past, present, and reasonably foreseeable future actions.

Ongoing wildfire mitigation activities on neighboring tracts of land, as initiated by residential landowners and private, local, State, or Federal entities that are similar in scale to those of the Proposed Action, would further reduce the possibility of an intense and widespread wildfire in the project area.

Crook County directly supported fuels reduction projects treating 1,000 to 1,200 acres between 2002 and 2012. The Post-Paulina Rangeland Fire Protection Association used prescribed fire to treat an additional 2,700 acres between 2007 and 2009, and treatment is ongoing. Additional juniper reduction efforts are ongoing on private lands in support of Oregon State University/Crook County Extension upland rangeland rehab and sage grouse habitat improvements. Junipers are currently far more widely distributed than their historic range due to fire suppression and lack of fuels to carry fire through stands (Crook County 2014b).

Crook County does not currently have a fuels treatment ordinance but the *Crook County Community Wildfire Protection Plan* (Crook County 2014a) recommends the minimum hazardous fuels treatment standards which are shown in Appendix B. A draft fuels treatment ordinance is planned for approval by the County (Crook County 2014b).

The BLM and USFS have ongoing fuels reduction programs through prescribed burning and thinning near the project area communities, and the 2014 prescribed fire program in Crook County could treat approximately 2,468 acres (USFS 2014b). The nearest prescribed burns to the project area include the Prineville pile burn 0.5 mile south of the Juniper Canyon community, the Millican Road jackpot burn 5.5 miles south of the Millican Road community, and the Dry Creek pile burn 1 mile west of the Ochoco Reservoir community.

Given the small scale and scattered distribution of acreage proposed for treatment by the Proposed Action, when combined with other activities that are planned by the County, State and Federal entities, the Proposed Action is not expected to have adverse cumulative impacts on geology or soils; air quality; climate; water resources, wetlands, or floodplains; wildlife or fish (including ESA-listed species and habitat); historic or archaeological resources; socioeconomic resources or environmental justice; or recreation because no project impacts are anticipated. Minor cumulative impacts to vegetation are anticipated, but the impacts would be limited to the project area and surrounding properties.

Cumulative impacts to wildfire adapted vegetation communities are possible as a result the treatment methodology (limited thinning, removing brush and lower limbs) altering understory characteristics. However, the impacts are expected to be minor, because this methodology may mimic some of the vegetation management effects of periodic low intensity natural wildfires. Furthermore, the cumulative effect of treating contiguous properties reduces the risk of a catastrophic wildfire and consequent widespread loss of vegetative cover. The Proposed Action when combined with other wildfire mitigation activities will reduce overall wildfire risk and benefit public safety.

SECTION FIVE AGENCY COORDINATION AND PUBLIC INVOLVEMENT

During project development, Crook County coordinated with surrounding jurisdictions, local agencies, homeowners, and landowners in the project area. During preparation of this EA, the SHPO and the Confederated Tribes of Warm Springs were contacted for comment.

FEMA initiated the NEPA scoping process by sending out a scoping notice on July 18, 2014, to agencies and interested parties. The purpose of the scoping process was to inform agencies and stakeholders about the proposed project and allow the public, organizations, agencies, and Tribes to provide comments regarding the scope of the project, the proposed alternatives, and any environmental and historic preservation issues of concern that should be considered in the draft EA. The 30-day period for scoping comments ended on August 18, 2014. No substantive comments were received.

A public notice is required for the draft EA; a copy of this notice is provided as Appendix E. The public, Tribes, and agencies will have the opportunity to comment on the EA for 30 days after publication of the notice. The notice identifies the action, the location of the proposed target communities, the participants, and the location of the draft EA, and indicates how to submit comments. FEMA will review all substantive written comments for issues that need to be addressed with the County and will incorporate any resolutions into the final EA, as appropriate.

The following documents are relevant to public involvement efforts supporting this draft EA: *State of Oregon Natural Hazards Mitigation Plan* (Oregon Partnership for Disaster Resilience 2012)*, Crook County Community Wildfire Protection Plan* (Crook County 2014a), and *Prineville / Crook County Natural Hazards Mitigation Plan* (Crook County 2010). These documents are described in the following subsections.

5.1 STATE OF OREGON NATURAL HAZARDS MITIGATION PLAN

The *State of Oregon Natural Hazards Mitigation Plan* (Oregon Partnership for Disaster Resilience 2012) includes a risk assessment to identify natural hazards, strategies, programs, and goals for each hazard and proposes mitigation strategies. Preparation of the plan included coordination with State and local stakeholders. The Oregon Partnership for Disaster Resilience facilitated the plan process, and the Interagency Hazard Mitigation Team (IHMT) for the State served as the plan's coordinating body. The IHMT consists of approximately 20 State agencies and organizations. The *State of Oregon Natural Hazards Mitigation Plan* is intended to be used as a resource for the development and/or update of local natural hazard mitigation plans.

The 11 primary natural hazards that are covered in the plan are coastal erosion, drought, dust storm, earthquake, fire, flood, landslide, tsunami, volcano, windstorm, and winter storm.

Wildfire is a common and widespread natural hazard in Oregon, and 22 Oregon communities that border Federal lands are at risk of damage from wildfire. Several hundred additional communities that are in the WUI are also at risk from wildfire.

5.2 CROOK COUNTY COMMUNITY WILDFIRE PROTECTION PLAN

The *Crook County Community Wildfire Protection Plan* (Crook County 2014a) was updated in June 2014. It was prepared to better understand the communities and components of critical infrastructure at risk of wildfire. The 2013–2014 Steering Committee collaborated with Federal, State, and local agencies and solicited public input during the planning process. The plan has a risk assessment, recommendations to reduce structural vulnerability, action plan, assessment strategy, and a monitoring and annual review plan. Six WUI areas, including three areas containing the project area, were analyzed during the development of this wildfire protection plan.

5.3 PRINEVILLE / CROOK COUNTY NATURAL HAZARDS MITIGATION PLAN

The *Prineville / Crook County Natural Hazards Mitigation Plan* (Crook County 2010) identifies and summarizes natural hazards and provides goals and action items. The lead agency that developed the plan was the Crook County Emergency Management Department. The Project Steering Committee consists of County and local officials and organizations; other consulting entities included Federal, State, and local agencies and the public.

The six primary natural hazards covered by the plan are earthquake, flood, landslide, severe winter storm and windstorm, wildland fire, and volcanic eruption. The Project Steering Committee ranked wildfire as the second highest overall hazard risk.

SECTION SIX PERMITTING, PROJECT CONDITIONS, AND MITIGATION MEASURES

No permits are anticipated for the Proposed Action. Activities in the project area would comply with the project's scope of work methodology, described in Section 3.

Crook County would comply with the following project conditions and mitigation measures:

- The County is responsible for selecting, implementing, monitoring, and maintaining Best Management Practices to control erosion and sedimentation, reduce spills and pollution, and provide wetland and habitat protection.
- The County is responsible for securing all applicable local, State, and Federal permitting before site work and for complying with any conditions therein.
- In the event that cultural resources are discovered during project activities—and in compliance with State and Federal laws protecting cultural resources, including Section 106 of the NHPA—work in the immediate vicinity would cease, the area would be secured, and SHPO and FEMA would be notified.
- Any change to the approved scope of work would require re-evaluation for compliance with NEPA and other laws and EOs before implementation.
- Crook County would be required to avoid identified archaeological sites as a precaution to prevent minor potential disturbances, such as pedestrian traffic or vegetation removal across a site. Work is also conditioned to maximize all machinery vehicles to stay within existing roads on both public and private lands.
- Work would be restricted within riparian management areas per ODF water protection rules. Project area specific stream buffers would be established during the initial site assessment for property owner participants.
- To minimize potential impacts to migratory nesting birds, vegetation removal should occur from late summer to mid-winter, outside of the typical migratory bird-nesting season (April 15 to July 31). If removal activities must take place during the nesting season, the County shall ensure that a qualified professional conducts a breeding bird survey before removal activities begin in order to avoid disturbance or "take" as defined by the MBTA. Surveys should be coordinated with the USFWS to determine if a permit under MBTA is required or if other measures can be taken to address impacts to migratory birds or active nests. This information must be documented on the project site assessment and treatment plan (Appendix C).
- The Airport community has a seasonal restriction during the golden eagle nesting period (January 15 to August 30). Work would be prohibited during this period, unless surveys as described above, determined work during the nesting season would not result in disturbance or "take."

SECTION SEVEN CONCLUSION

The draft EA evaluates environmental and historic resources that could be affected by the Proposed Action. The evaluation does not identify any significant adverse impacts associated with the resources of geology or soils; air quality; climate; water resources, wetlands, or floodplains; vegetation; wildlife or fish (including ESA-listed species and habitat); historic or archaeological cultural resources; socioeconomic resources or environmental justice; or recreation. Implementing the Proposed Action, which is relatively small scale because of the widely scattered nature of properties expected to be treated, along with any conditions outlined in the initial site assessment and treatment plan (Appendix C), associated with permits or approvals, is expected to avoid or minimize adverse effects associated with the action.

Following public involvement, FEMA will determine whether to issue a FONSI for the Proposed Action.

SECTION EIGHT LIST OF PREPARERS

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Appendix A
Figures

Appendix B
Defensible Space – Minimum Hazardous Fuels Treatment Standards

The *Crook County Community Wildfire Protection Plan* (Crook County 2014a) recommends the following minimum hazardous fuels treatment standards. It is intended that these standards mirror the standards in the ODF Oregon Forestland-Urban Interface Fire Protection Act (Senate Bill 360) that applies to ODF-protected WUI areas. It is recognized that slightly differing treatment regimes are needed for Ponderosa pine and Western Juniper/sage/grass ecotypes. The differences in fuel components of the two eco-types will result in slightly differing fuel treatment approaches, but similar treatment distances around structures are still appropriate.

- **Primary Fuel Break** – Establish a 30-foot primary fuel break around structures. Correctly developed, this break should slow the rate of spread, reduce the intensity of an advancing wildfire, and create an area where suppression operations may safely occur. The primary fuel break begins at the outside edge of a structure's farthest extension, which may be the edge of a roof eve or the outer edge of a deck attached to the structure.

  In the primary fuel break zone:

  - Ground cover should be substantially non-flammable. Examples are asphalt, bare soil, clover, concrete, green grass, ivy, mulches, rock, succulent ground cover, and wildflowers.
  - Dry grass should be cut to a height of less than 4 inches.
  - Cut grass, leaves, needles, twigs, and similar small vegetative debris should be broken up so that a continuous fuel bed is not created.
  - Shrubs and trees should be maintained in a green condition, be substantially free of dead plant material, and have any potential "ladder fuels" removed.
  - Trees and shrubs should also be arranged so that fire cannot spread or jump from plant to plant. Some thinning may be necessary to accomplish this.

- **Secondary Fuel Break** – Begins where the primary fuel break ends and continues an additional 20 to 70 feet depending on risk classification (under the provisions of the Oregon Forestland-Urban interface Fire Protection Act) and the type of roofing on the structure. Because of Crook County's weather factors and vegetative types, nearly all interface sites in the County will rate as "high," "extreme," or "high density extreme." Characteristics of the secondary fuel break include trees and shrubs that are:
  - Green and healthy
  - Substantially free of dead branches
  - Pruned where necessary to keep fire from "laddering" into tree crowns
  - Thinned to the degree necessary to prevent fire from transferring from plant to plant

Source: Crook County (2014a)

Appendix C
Project Site Documentation for Wildfire Fuels Reduction Projects

Site Information

Landowner Name (print):
Mailing Address:
Mailing City/State/Zip:
Property Address (or taxlot): Size (acres):
Phone: Email:

Pre-Mitigation Assessment

Number of acres proposed for treatment:

☐ Provided photos of pre-mitigation conditions.

Type of Work Proposed	Site Characteristics Requiring Additional Protection
☐ Create defensible space: distance around structures (ft.): number of structures:	☐ Stream
☐ Clear roof and gutters	☐ Lake
☐ Reduce fuels along driveway	☐ Wetland
☐ Ladder fuel reduction	☐ Sensitive bird site
☐ Other site work (explain below):	☐ T&E species
	☐ Other:
	☐ No Issues

Additional Details

Specific Site Characteristics: Provide a description of the existing site conditions in terms of fuels/vegetation, structures/improvements, and topography.

Protected Natural Resources: Use the area below to describe sensitive resources on or next to the property that requires protection. Include water bodies, wetlands, wildlife sites, etc. by name or other identifier.

Tree and Vegetation Retention/Vegetative Buffers: Describe the vegetative buffers and other trees/vegetation that will be retained during and after operations to prevent damage to any protected natural resources.

Practices

Describe the specific fuels treatment practices that will be utilized to protect the identified sensitive resources.

I certify that the above information provided in the Pre-Mitigation Assessment is true and correct:

Landowner Signature: Date:

Subgrantee Rep.: Signature: Date:

Post-Mitigation Verification

- ☐ There were changes to the work proposed and/or site conditions and resource protections presented in the Pre-Mitigation Assessment. A description of these changes is attached or described below.
- ☐ Provided photos of post-mitigation site conditions.
- ☐ Entered into GIS database.

Match Valuation

Work Intensity	Value / Acre		# of		Total Value
Low (thin and pile slash)	$240	X		=	
Medium (thin and pile slash)	$360	X		=	
Medium/Heavy. (thin and pile slash)	$460	X		=	
Heavy (thin and pile slash)	$580	X		=	
Very Heavy (thin and pile slash)	$680	X		=	
Load and Haul	$300	X		=	
Burn - piles	$220	X		=	
Other site work		X		=	

I certify that the above information provided in the Post-Mitigation Verification is true and correct and that non-Federal resources were used in performing the work described in the match valuation above:

Landowner Signature: Date:

Subgrantee Rep.: Signature: Date:

Source: FEMA (2014)

Appendix D
Migratory Bird Species in Crook County

The following migratory bird species are common to the region that includes Crook County.

Common Name	Scientific Name	Common Name	Scientific Name
American coot	*Fulica americana*	Lazuli bunting	*lazuli bunting*
American goldfinch	*Spinus tristis*	Loggerhead shrike	*loggerhead shrike*
American robin	*Turdus migratorius*	Mallard	*Anas platyrhynchos*
Ash-throated flycatcher	*Myiarchus cinerascens*	Mountain chickadee	*Poecile gambeli*
Bald eagle	*Haliaeetus leucocephalus*	Northern goshawk	*Accipiter gentilis*
Black-headed grosbeak	*Pheucticus melanocephalus*	Pied-billed grebe	*Podilymbus podiceps*
Brewer's sparrow	*Spizella breweri breweri*	Pinyon jay	*Gymnorhinus cyanocephalus*
Calliope hummingbird	*Stellula calliope*	Prairie falcon	*Falco mexicanus*
Canada goose	*Branta canadensis*	Pygmy nuthatch	*Sitta pygmaea*
Cassin's finch	*Carpodacus cassinii*	Redhead	*Aythya americana*
Canyon wren	*Catherpes mexicanus*	Red crossbill	*Loxia curvirostra*
Chukar	*Alectoris chukar*	Rock wren	*Salpinctes obsoletus*
Cinnamon teal	*Anas cyanoptera*	Rufous hummingbird	*selasphorus rufus*
Cliff swallow	*Petrochelidon pyrrhonota*	Sage thrasher	*Oreoscoptes montanus*
Common nighthawk	*Chordeiles minor*	Saw-whet owl	*Aegolius acadicus*
Common raven	*Corvus corax*	Say's phoebe	*Sayornis saya*
Dusky flycatcher	*Empidonax oberholseri*	Vesper sparrow	*Pooecetes gramineus*
Eared grebe	*Podiceps nigricollis*	Violet-green swallow	*Tachycineta thalassina*
Gray flycatcher	*Empidonax wrightii*	Western screech owl	*Megascops kennicottii*
Great horned owl	*Bubo virginianus*	White-breasted nuthatch	*Sitta carolinensis*
Golden eagle	*Aquila chrysaetos*	White-headed woodpecker	*Picoides albolarvatus*
House wren	*Troglodytes aedon*	Williamson's sapsucker	*Sphyrapicus thyroideus*
Lark sparrow	*Chondestes grammacus*	Willow flycatcher	*Empidonas traillii*

Source: USFWS (2014b)

Appendix E
Public Notice

PUBLIC NOTICE

Federal Emergency Management Agency
Draft Environmental Assessment
Central Oregon Wildfire Mitigation Project in Crook County

The U.S. Department of Homeland Security's Federal Emergency Management Agency (FEMA) proposes to provide funding to Crook County for a fuels reduction project in Crook County, OR. Funding would be provided as authorized by Section 203 of the Robert T. Stafford Disaster Assistance and Emergency Relief Act.

FEMA has prepared a draft Environmental Assessment (EA) for the proposed project pursuant to the National Environmental Policy Act of 1969 and FEMA's implementing regulations at Title 44 of the Code of Federal Regulations Part 10. The draft EA evaluates alternatives for compliance with applicable environmental laws, including Executive Orders 11990 (Protection of Wetlands), 11988 (Floodplain Management), and 12898 (Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations). The alternatives that are evaluated in the draft EA are (1) no action and (2) fuels reduction in the communities of Airport, Grizzly, Juniper Canyon, Marks Creek, Millican Road, Ochoco Reservoir, Powell Butte 1, and Powell Butte 2 (Proposed Action).

The draft EA is available to the public on FEMA's Web site at http://www.fema.gov/environmental-historic-preservation-documents and will be available on December 22, 2014, at the Crook County Courthouse, 300 NE 3rd St, Prineville, OR 97754.

If no significant issues are identified during the comment period on the draft EA, FEMA will finalize the draft EA, issue a Finding of No Significant Impact (FONSI), and fund the project. The FONSI will be available to the public at http://www.fema.gov/environmental-historic-preservation-documents. Unless substantive comments on the draft EA are received, FEMA will not publish another notice for this project.

The deadline for submitting written comments on the draft EA is January 26, 2015, at 5 p.m. Comments should be mailed to Science Kilner, Deputy Regional Environmental Officer, FEMA Region X, 130 228th Street SW, Bothell, WA 98021; e-mailed to science.kilner@fema.dhs.gov; or faxed to 425-487-4613.