

**FEDERAL EMERGENCY MANAGEMENT AGENCY  
FINDING OF NO SIGNIFICANT IMPACT  
Kittitas County Wildfire Fuels Reduction Project  
FEMA-4188-DR-WA-HMGP**

Kittitas County has applied for funding under the U.S. Department of Homeland Security's Federal Emergency Management Agency (FEMA) Hazard Mitigation Grant Program (HMGP) for a wildfire fuels reduction mitigation project. The HMGP is authorized under Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988 (Public Law 93-288, as amended, 42 U.S. Code § 5121-5207) and in the State is administered by the Washington Emergency Management Division. HMGP funds are available from the August 11, 2014, Presidential Major Disaster declaration FEMA-4188-DR-WA. The Kittitas County project comprises creation of defensible space and vegetative fuels reduction around residential structures in the Sunlight Waters, Middle Fork Teanaway, North and South Cle Elum Ridge communities, which the County determined to be at high or extreme risk for wildfire hazards.

The combined project areas comprise about 9,352 acres containing 975 lots, of which approximately 558 of the lots have structures. The Proposed Action would reduce fuels through vegetation removal and creation of defensible space for about 28 structures distributed within the target communities, depending on property owner participation and funding availability. The County's goal is for at least 20 percent of property owners within the communities participate in wildfire mitigation activities. Lot sizes vary and could be up to 10 acres. The Proposed Action consists of the following components to be implemented by the Kittitas County Conservation District (KCCD):

- Assess the wildfire threat to the participating property.
- Develop a vegetative fuels reduction and management plan for the property.
- Implement the plan and create defensible space around the structures and property. This would include removal of ladder fuels and other biomass using chainsaws, chippers, brush mowers, and masticators. Limited ground disturbance would occur during fuels reduction. Vegetative debris would be chipped onsite or may be disposed offsite at a facility authorized for vegetative debris disposal. Onsite wood chips would be dispersed away from structures; larger woody debris would be piled away from structures and other vegetation/fuel sources for use as wildlife habitat components.
- Following initial treatment, property owners would sign a 10-year maintenance contract with KCCD and conduct annual vegetation maintenance surrounding the structures. The KCCD will monitor maintenance activities.

## FINDING OF NO SIGNIFICANT IMPACT

The defensible space would be created consistent with Firewise Program guidelines; sponsored by the U.S. Forest Service, U.S. Department of the Interior, and National Association of State Foresters; which include the following:

- Creation of a defensible space zone with at least a 30-foot radius and out to 200 feet around a structure's foundation. The radius may be expanded to provide additional defensible space around structures on steep slopes.
- Planting grass and small islands of fire-resistant plants in the defensible space.
- Trimming 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.
- Avoid removing all vegetation in the defensible space to alleviate the potential for increased soil erosion, especially on the sloped areas.

These guidelines will be augmented by the County's fuels reduction requirements as follows:

- Dead and down material up to 10 inches in diameter will be chipped and the chips scattered over the work site. Some of the material may be left for home firewood.
- The limbs of dead and down trees greater than 10 inches in diameter will be removed and chipped and the remaining trunk will be left in place unless several trees have created a piled concentration. In this case, the remaining tree trunks will be separated by at least 10 feet from any other logs and left on site.
- All vegetation stumps heights will be cut no higher than 2 inches above the ground. All cuts will be a flat or parallel cut to the ground.
- Standing dead trees with red needles still attached shall be felled and treated using the dead and down prescription as required in item 1 and 2 above.
- Contractors will not cut any green trees from the premises that are greater than 8-inch diameter at breast height without prior approval from the landowner.
- Trees 8 inches and greater in diameter (DBH) will be pruned (live and dead limbs) up to a height of 15 feet. Limbs will be pruned when branches are larger than 2 inches diameter (regardless of length) or greater than 2 feet in length (regardless of diameter). No pruning will be done to a height greater than 50% of total tree height. The cut limbs will be chipped on site.
- Trees less than 8 inches DBH will be spaced leaving 2 feet - 5 feet between crowns. Live and dead limbs will be pruned up to a height of 15 feet. Limbs will be pruned when branches are larger than 2 inches diameter (regardless of length) or greater than 2 feet in length (regardless of diameter). No pruning will be done to a height greater than 50% of

total tree height. The cut limbs and stems will be chipped on site. Trees < 3 feet high do not require pruning.

- Non-coniferous brush will be cut and chipped/mowed on site unless islands are pre designated or agreed to by the landowner.

In accordance with the National Environmental Policy Act (NEPA) of 1969 and FEMA's implementing Instructions 108-1-1, FEMA prepared an Environmental Assessment (EA) to identify and evaluate potential environmental effects resulting from the alternatives presented in the EA and to determine whether to prepare an Environmental Impact Statement (EIS) or a Finding of No Significant Impact (FONSI). Alternatives evaluated in the EA include: 1) No Action, and 2) the Proposed Action day public review and comment period; Limited substantive comments were received and have been addressed. The Proposed Action is the preferred alternative and selected alternative because the No Action alternative would not address the purpose and need stated in the EA and no other practical alternatives were identified.

**FINDINGS**

Based upon the HMGP grant application, EA, Attachment A, and in accordance with 1) FEMA's Instruction I08-1-1 for environmental planning and historic preservation responsibilities, including Executive Orders (EOs) addressing floodplains (EO 11988), wetlands (EO 11990), and environmental justice (EO 12898); 2) the Department of Homeland Security's Instruction Manual 023-1-1 and 3) the Council of Environmental Quality's regulations in Tide 40 Code of Federal Regulations , Chapter V for implementing NEPA; FEMA determined the proposed project will not significantly affect the quality of the natural and human environment. As a result of this FONSI, an EIS will not be prepared and the project, as described in the grant application, attached EA, and the following conditions may proceed.

**EHP APPROVAL**



Mark G. Eberlein  
Regional Environmental Officer  
FEMA Region 10

7-11-17

Date

**EHP ENDORSEMENT**



Kristen Meyers  
Hazard Mitigation Assistance Branch Chief  
FEMA Region 10

7-11-17

Date

## Attachment A

### PERMITTING, PROJECT CONDITIONS, AND MITIGATION MEASURES

Kittitas County shall implement the Proposed Action as outlined above and comply with the following project conditions and mitigation measures:

- To minimize potential impacts to surface waters, no vegetation management activities would be allowed within 50 feet of a stream's OHWM for non-fish bearing streams and 75 feet for fish-bearing.
- Fuels reduction activities in wetlands in the target communities would be avoided. If wetlands cannot be avoided, additional analysis of proposed activities and the wetland(s) on the project site would be required to minimize impacts.
- Removal of trees 8 inches dbh or greater would be prohibited within 100 feet of the OHWM of water bodies with known presence of ESA-listed fish species or as otherwise specified during ESA consultation, including: Yakima River and tributaries (including Tillman and Crystal Creeks), West Fork Teanaway River, Middle Fork Teanaway River (including Lick Creek), North Fork Teanaway River (and creek tributaries), and Teanaway River and tributaries of the river (including Mason Creek).
- To avoid potential noise-related disturbance to Northern spotted owls, project activities would be prohibited between March and August within suitable nesting/roosting habitat for Northern spotted owls as delineated in the Biological Assessment (Appendix E), Figures E-2 through E-5.
- Vegetation clearing of the project areas, including the removal of vegetation, during the migratory bird nesting period between March and August, has the potential to impact active migratory bird nests. If the nesting season can not be avoided, the proposed project is still subject to the prohibitions of the Migratory Bird Treaty Act and the County is responsible for obtaining and complying with any necessary permits from USFWS. The USFWS allows empty or abandoned nests to be removed and destroyed without a permit as long as they are not taken into possession. See: <http://www.fws.gov/migratorybirds/mbpermits/PoliciesHandbooks/MBPM-2.nest.PDF>
- To reduce adverse effects on wildlife habitat, treatment prescriptions beyond the immediate structure defensible space and for larger parcels will incorporate wildlife habitat best management practices included in the Woodland Fish and Wildlife Group's Wildlife-Friendly Fuels Reduction in Dry Forests of the Pacific Northwest (Strong, Bevis, & Bracher, 2016). These include leaving select snags, shrubs, and vegetative clumps; and piling vegetative debris. The KCCD may also consult with WDFW as needed in particular for larger parcels, to further incorporate habitat features into treatment prescriptions.

- To minimize the potential for impacts to known archeological resources within the target communities, the County would be required to determine if a participating property has or is close to a known cultural site. Site locations would be provided separately and characterized as avoidance areas. Details of cultural sites must remain confidential. Fuels reduction activities must be avoided within the perimeter of the recorded site location plus a 250 feet buffer. This information must be documented on the project site assessment/treatment plan.
- Kittitas 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. To the maximum extent practicable, vegetation removal activities beyond the immediate defensible space around a structure that involves use of mechanized equipment should be conducted in dry soil conditions and equipment staged on existing roads or previously disturbed areas.
- Kittitas County is responsible for securing all applicable local, State, and Federal permitting before site work and complying with conditions therein.
- In the event that cultural resources or including human remains are discovered during project activities, and in compliance with State and Federal laws protecting cultural resources and human remains, including Section 106 of the NHPA, work in the immediate vicinity would cease, the area would be secured, and the SHPO and FEMA would be notified in order to evaluate the discovery.
- Any change to the approved scope of work would require re-evaluation for compliance with NEPA and other laws and EOs before implementation.

Environmental Assessment

**Wildfire Fuels  
Reduction Project**

Kittitas County, WA

*July 2017*



**FEMA**

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## List of Acronyms and Abbreviations

ACHP	Advisory Council on Historic Preservation
AIRFA	American Indian Religious Freedom Act of 1978
APE	Area of Potential Effect
CAA	Clean Air Act of 1970
CEQ	Council on Environmental Quality
CO	Carbon monoxide
CFR	Code of Federal Regulations
dbh	diameter at breast height
DR	Disaster declaration number
EA	Environmental Assessment
EO	Executive Order
ESA	Endangered Species Act of 1973
ESU	Evolutionarily Significant Unit
FEMA	Federal Emergency Management Agency
FONSI	Finding of No Significant Impact
FPPA	Farmland Protection Policy Act of 1981
GAP	Gap Analysis Program
GHG	Greenhouse Gas
HMGP	Hazard Mitigation Grant Program
HOA	Homeowners Association
KCCD	Kittitas County Conservation District
KRD	Kittitas Reclamation District
MBTA	Migratory Bird Treaty Act of 1918
MOA	Memorandum of Agreement
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act of 1990
NEPA	National Environmental Policy Act of 1969
NFPA	National Fire Protection Association
NHPA	National Historic Preservation Act of 1966
NOAA	National Oceanographic and Atmospheric Administration
NRCS	Natural Resources Conservation Service



NO <sub>2</sub>	Nitrogen dioxide
NRHP	National Register of Historic Places
NWCC	Northwest Interagency Coordination Center
NWI	Northwestern Improvement Company
O <sub>3</sub>	Ozone
OHWM	Ordinary High Water Mark
PA	Programmatic Agreement
Pb	Lead
PM	Particulate matter
POC	Point of Contact
RCW	Revised Code of Washington
SHPO	State Historic Preservation Officer
SO <sub>2</sub>	Sulfur dioxide
THPO	Tribal Historic Preservation Officer
U.S.C.	U.S. Code
USEPA	U.S. Environmental Protection Agency
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WDE	Washington Department of Ecology
WDFW	Washington Department of Fish and Wildlife
WDNR	Washington Department of Natural Resources
WEMD	Washington Emergency Management Division
WISAARD	Washington Information System for Architectural and Archaeological Records Data
WUI	Wildland-Urban Interface

## Glossary

**Alluvium:** Loose, unconsolidated soils that have been eroded and reshaped by water in some form.

**Area of Potential Effects:** 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.

**Colluvium:** Loose, unconsolidated soils that have been deposited at the base of hillslopes.

**Defensible Space:** Clearings between wildland vegetation and structures.

**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 even proportions. Loess: Deposits of silt that have been laid down by wind action.

**Ordinary High Water Mark:** 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.

**Residuum:** Remaining soil after soluble elements have dissolved.

**Prescribed Burn:** Any fire ignited for vegetation management.

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

**Suppression:** Response to wildland fire 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.

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## **SECTION ONE: Introduction**

Kittitas County, Washington, has applied for funding under the Federal Emergency Management Agency (FEMA) Hazard Mitigation Grant Program (HMGP) for financial assistance for the Wildfire Fuels Reduction Project (Proposed Action) in Kittitas County (County) in central Washington. The HMGP is authorized under Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988 (Public Law 93-288, as amended, 42 U.S. Code [U.S.C.] §§ 5121-5207) and is administered in Washington State by the Washington Emergency Management Division (WEMD). HMGP funds are available from the August 11, 2014, Presidential Major Disaster declaration FEMA-4188-DR-WA. The purpose of the HMGP is to help communities implement hazard mitigation measures following a Presidential major disaster declaration. The Proposed Action in Kittitas County targets the communities of Sunlight Waters, Middle Fork Teanaway, North Cle Elum Ridge, and South Cle Elum Ridge. Appendix A, Figures 1 through 5, show the project area.

This Environmental Assessment (EA) was prepared in accordance with the National Environmental Policy Act of 1969 (NEPA), 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); U.S. Department of Homeland Security Instruction 023-01, and FEMA Instruction 108-01-1, NEPA implementing procedures. 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 Kittitas County Wildfire Fuels Reduction Project. FEMA would use the findings in this EA to determine whether an Environmental Impact Statement is required or if a Finding of No Significant Impact (FONSI) should be issued.

## SECTION TWO: PURPOSE AND NEED

The HMGP provides grants to States, federally-recognized tribes, and local governments to implement long-term hazard mitigation measures after a major disaster declaration. Hazard mitigation is any action taken to reduce or eliminate long term risk to people and property from natural hazards. The purpose of the Wildfire Fuels Reduction 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.

According to the *Kittitas County Wildfire Protection Plan* (Kittitas County, 2009), the Washington Department of Natural Resources (WDNR) has rated the wildfire hazard in Sunlight Waters and Middle Fork Teanaway as extreme and high, respectively. Current fire risks for North Cle Elum Ridge and South Cle Elum Ridge are extreme (WDNR, 2017a). The *Kittitas County Wildfire Protection Plan* lists the following wildfire risk factors for the four communities proposed for this project (Kittitas County, 2009):

- Sunlight Waters – Narrow roads toward the bottom of the development; one-lane wooden bridge in the middle of the development; development on steep slopes that exceed 40 percent on the sides of the community; timber and brush heavy within canyon areas; and homes on the edge of the development having no defensible space.
- Middle Fork Teanaway – Narrow roads, particularly along Wagon Wheel Road; heavy timber and slash in the West and Middle Fork; and houses with combustible siding and decks are built on ridges and in draws.
- North Cle Elum Ridge – This community is not specifically addressed in the *Kittitas County Wildfire Protection Plan*. However, the southeastern portion of North Cle Elum Ridge falls within Lanigan Springs, which is characterized by heavy timber and brush. Parallel ridges with interceding valleys are found throughout this project area.
- South Cle Elum Ridge – This community is not specifically addressed in the *Kittitas County Wildfire Protection Plan*. However, a portion of South Cle Elum Ridge falls within Peoh Point, which is characterized by heavy fuels and timber in its southern regions. A steep ridge runs parallel to the south, though the majority of Peoh Point is mild in slope.

The Sunlight Waters, Middle Fork Teanaway, North Cle Elum Ridge, and South Cle Elum Ridge subdivisions were established in the 1970s and 1980s and have few fire protection mechanisms in place. The 2006 *International Wildland-Urban Interface Code* (International Code Council, 2006) requires property owners of new construction to meet building construction and defensible space requirements, but Kittitas County does not have the authority to mandate these requirements for owners of properties that were constructed before 2006. Some property owners have participated in the Firewise program (explained further in Section 3.2), but many have not adopted defensible space measures because of time, expense, competing concerns, misperceptions about wildfire risks, or a lack of awareness that they share responsibility for fire protection (Kittitas County, 2009).

The total of approximately 9,352 acres in the project area contain 975 lots, and approximately 558 of the lots have structures. There are many primary and secondary residences and State and Federal

lands in Kittitas County with dangerous levels of high-hazard fuels adjacent to the extreme wildfire risk areas that are included in the Wildfire Fuels Reduction Project, which create additional hazards for wildfire in the larger vicinity.<sup>1</sup>

In the past decade, much of the residential development in the County has occurred in the wildland-urban interface in areas identified as having an extreme wildfire risk. A wildland-urban interface analysis conducted by the National Fire Protection Association (NFPA) for Kittitas County found that 33 percent of the County is classified as high risk for wildfires (Kittitas County, 2012).

Over the 2012-2014 fire seasons, six major wildfires occurred in Kittitas County: the Taylor Bridge (23,503 acres) and Table Mountain (42,483 acres) fires in 2012; Colockum Tarps (81,739 acres) fire in 2013; and Snag Canyon (12,596 acres), Saddle Mountain (23,503 acres), and I-82 Manastash Ridge (1,997 acres) fires in 2014 (NWCC, 2017). Collectively, these fires resulted in the loss of 143 structures (WEMD, 2014). Kittitas County reported spending \$70 million over this period for fire suppression, and damage to infrastructure and private and public properties/structures resulting from wildland fires (WEMD, 2014).

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<sup>1</sup> Information regarding total project area, number of lots, and number of lots with structures was provided in Washington's HMGP Grant Application (DR-4188) and in email correspondence received from the sub-applicant (POC: Rose Shriner) on January 30, 2017. This information is included in the Administrative Record.



## 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 mitigation would occur in the project area. Wildfire risk in the Wildland-Urban Interface (WUI) would continue as a result of existing, untended heavy ladder fuels 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 Kittitas County or homeowners insurance providers.

### 3.2 Proposed Action

The description of the Proposed Action is based primarily on the 2014 HMGP grant application, information collected during a site visit in December 2016, and updates from Kittitas County and the Kittitas County Conservation District (KCCD).

Kittitas County would work with the local fire districts and KCCD to implement the Proposed Action. The Proposed Action consists of the following components which would be implemented only for the property owners in the project area who elect to participate in the Proposed Action.

- Assessment of the wildfire threat to the property.
- Development and implementation of a fuels reduction and vegetation management plan for the property. Ladder fuels and other biomass would be removed using chainsaws, chippers, brush mowers, and masticators. Limited ground disturbance would occur during fuels reduction. Vegetative debris would be chipped or piled onsite or may be disposed offsite at a facility authorized for vegetative debris disposal. Onsite wood chips would be dispersed away from structures; larger woody debris would be piled away from structures and other vegetation/fuel sources for use as wildlife habitat components.
- Creation of a defensible space around the property. A properly maintained defensible space protects a structure from surrounding wildfires and provides a relatively safe area for firefighters in which to work. The defensible space would be created according to Firewise program guidelines.

The Proposed Action would be implemented according to the Firewise guidelines for defensible space in *Introduction to Firewise Principles* (NFPA, 2009). The 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 and out to 200 feet around a structure's foundation. The radius may be expanded to provide additional defensible space around structures on steep slopes. Fuels reduction could occur on properties as large as 10 acres, but treatment would be more intense closer to structures in the defensible space zone.
- 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 could increase soil erosion, especially on the sloped areas, which are found in much of the project area.

Appendix A, Figure 6, illustrates the Firewise guidelines, and Figure 7 shows an example of a treated property that was protected from a wildfire.

Kittitas County's requirements for fuels reduction projects listed in Appendix B would also be followed. The requirements pertain, for example, to dead and downed materials, stumps and standing dead trees, and live tree pruning and spacing. Habitat goals included in the Woodland Fish and Wildlife Group's *Wildlife-Friendly Fuels Reduction in Dry Forests of the Pacific Northwest* (Strong, Bevis, & Bracher, 2016) would be incorporated as best management practices into property treatment plans, where possible. The KCCD may consult with the Washington Department of Fish and Wildlife on the inclusion of wildlife habitat components as needed or on select larger lots.

Vegetation management activities would be exempt from the County's Critical Area Ordinance (Kittitas County Board of Commissioners Office, 2017). The Washington State Growth Management Act (Chapter 36.70A of the Revised Code of Washington [RCW]) requires counties to have regulations to protect critical areas, including: wetlands, critical aquifer recharge areas, frequently flooded areas, geologically hazardous areas, and fish and wildlife habitat conservation areas.

Removal of trees 8 inches in diameter at breast height (dbh) or greater would be prohibited within 100 feet of water bodies with known presence of fish species listed under the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. §§ 1531– 1544). The prohibition would be applied 100 feet from the ordinary high water mark (OHWM) on each side of the following water bodies with known presence of ESA-listed fish species: Yakima River and tributaries (including Tillman and Crystal Creeks); West Fork Teanaway River; Middle Fork Teanaway River and Lick Creek; North Fork Teanaway River (and creek tributaries); and Teanaway River and tributaries of the river (including Mason Creek). No work would be permitted in wetlands.

The project areas have been identified in the *Kittitas County Wildfire Protection Plan* as high (Middle Fork Teanaway) or extreme (Sunlight Waters, North Cle Elum Ridge, and South Cle Elum

Ridge) fire hazard areas (WDNR, 2017a). The project area comprises approximately 9,352 acres in total.

Up to 28 lots could be protected depending on property owner participation and funding in the Proposed Action. This would comprise up to about 198 total acres treated, as distributed across the four target communities.

The County's goal for the Proposed Action is a minimum of 20 percent of property owner participation, but because of the recent wildfires in Kittitas County, participation is expected to be 40 percent or more. A participation of 20 percent would be as follows:

- Sunlight Waters has 294 lots, 205 of which are built. As Sunlight Waters lost many of its homes during the 2012 Taylor Bridge Wildfire, the entire Homeowners Association (HOA) is dedicated to providing defensible space, fuels reduction, and mitigation projects to the entirety of the development. There are currently 8 requests for assistance, with at least 40 more anticipated.
- Middle Fork Teanaway has 185 lots, 74 of which are built. To meet the 20 percent requirement, 14 lots would need fuels reduction. Currently, 16 property owners are on a waiting list to receive funding for fuels reduction and defensible space activities. This neighborhood is of significant concern due to a bug kill issue which has created stands of dead and dying trees.
- North Cle Elum Ridge is a development sitting immediately north of the City of Cle Elum. This area contains 208 total lots, 56 of which have been constructed. The fuels in this area have been very dry in recent years. There are currently 35 landowners showing interest in fuels reduction projects; three shaded fuel break projects have already been completed.
- South Cle Elum Ridge is composed of 288 lots, with 223 of them having been built. To meet the 20 percent participation requirement, 57 landowners would need to participate. South Cle Elum Ridge has two communities requesting to become Firewise Communities, and 12 property owners have requested fuels reduction assistance.

Participating property owners would be required to sign a 10-year maintenance contract with the KCCD that specifies the required annual maintenance. Scheduled maintenance activities would be conducted annually generally during the Firewise Community Days events, which take place during the spring after snow-melt. Maintenance of fuel treatment and mitigation would be reviewed by property owners and community committees. The review would be conducted within one year after the fuels reduction activities, and additional maintenance and mitigation would be conducted as needed after each annual reassessment.

The site assessment and treatment plan would be documented for each participating property. Mitigation measures, including avoidance and minimization measures would be incorporated into the project to limit the potential for adverse impacts to wildlife, water, and cultural resources. Prior to project completion, an operations and maintenance plan would be developed by the KCCD and submitted to FEMA for approval.

### **3.3 Alternatives Considered and Dismissed**

Two alternatives were considered and dismissed: reducing fuel loads through prescribed burning and replacing flammable structural materials with fire-resistant materials.

Prescribed burning was considered for areas beyond the 30-foot radius of structures, but the risk of an escaped fire would be high. Multiple burn locations would be required throughout the project area to effectively manage fuel loads. Prescribed burning is most effective in areas with light fuel loads. The risk to the residual forest increases where fuels are heavy and at higher elevations. Large stands of dead and dying pine, fir, and spruce trees in Kittitas County are easily ignitable fuels and create potentially unpredictable scenarios for prescribed burning. Surveys indicate that mortality of large stands of dead and dying pine, fir, and spruce trees is increasing throughout Kittitas County from the western pine beetle, douglas-fir beetle, and western spruce budworm (Kittitas County, 2009). Because of the potential risk presented by the existing ignitable fuels, the prescribed burning alternative was dismissed.

Replacing flammable construction materials (mostly roofing) with fire-resistant materials was also considered and is supported, but this alternative would not address the lack of defensible space or the presence of heavy fuel loads. The County determined it would be much more costly to implement, and in light of the limited available grant funds, opted to focus on than vegetation removal as a more wide reaching and effective approach. Additionally, Kittitas County does not have the authority to require these building code retrofits on homes built prior to 2006, unless the home is being substantially improved (Shriner, R., 2017). No other practicable alternatives were identified.

## 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; potential impacts are evaluated qualitatively based on the criteria listed in Table 1.

**Table 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 major topographical features in Kittitas County are the Cascade and Wenatchee Mountains on the west and north, respectively; the Yakima River Valley in the central portion of the County; and the Boylston and Saddle Mountains in the southeast along the Columbia River. The Swauk

formation is a non-marine sedimentary formation underlying the Cle Elum River drainage. It is composed of conglomerate sandstone and shale interbeds and dates to the Tertiary Period from 65 million years to 1.6 million years ago. Other bedrock formations in Kittitas County include metamorphic rocks, granite intrusions, and thick sequences of volcanic and marine sedimentary rock (Kittitas County, 2012).

From the Cascade Mountains, the topography slopes generally downward to the east and south in the Yakima River Valley to the Columbia River. The eastern part of Kittitas County consists of low rolling to moderately steep glacial terraces and long, narrow valleys. The southeast section of Kittitas County is characterized by moderately steep to steep glacial terraces and steep, rough, broken mountain foothills (Kittitas County, 2012).

Most of the soils in the County formed in residuum and colluvium derived from basalt with loess in the upper part. Other soils formed in alluvium, glacial till, glacial outwash, lacustrine deposits, volcanic ash, and residuum and colluvium derived from sedimentary, metamorphic, and igneous rock. Major soil types in the project area include Yalelake sandy loam, Cattcreek loamy sand, Bickleton silt loam, Underwood loam, Colter cindery sandy loam, Rockly-Rock outcrop complex, Firoke ashy fine sandy loam, and Swauk-Qualla complex (USDA, 2017).

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,<sup>2</sup> unique farmland,<sup>3</sup> and land of statewide or local importance<sup>4</sup> to non-agricultural uses. Farmlands subject to FPPA requirements may be forestland, pastureland, or cropland but cannot be urban built-up land. The Sunlight Waters project area contains 64 acres of prime farmland and 156 acres farmlands of statewide importance. There are 71 acres of prime farmland in South Cle Elum Ridge (ESRI, 2017).

#### **4.1.2 Air Quality**

The Clean Air Act of 1970 (CAA), 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 (USEPA) 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.

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<sup>2</sup> Prime Farmland: “Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and that is available for these uses.” (USDA, 2015)

<sup>3</sup> Unique Farmland: “Land other than prime farmland that is used for the production of specific high-value food and fiber crops, such as citrus, tree nuts, olives, cranberries, and other fruits and vegetables. It has the special combination of soil quality, growing season, moisture supply, temperature, humidity, air drainage, elevation, and aspect needed for the soil to economically produce sustainable high yields of these crops when properly managed.” (USDA Caribbean Area, 2017)

<sup>4</sup> Farmland of statewide importance: “The criteria for defining and delineating farmland of statewide importance are determined by the appropriate State agencies. Generally, this land includes areas of soils that nearly meet the requirements for prime farmland and that economically produce high yields of crops when treated and managed according to acceptable farming methods.” (USDA Caribbean Area, 2017)

Secondary air quality standards protect public welfare by promoting ecosystems health and preventing decreased visibility and damage to crops and buildings (USEPA, 2016a).

The USEPA has set national ambient air quality standards (NAAQS) for the following six criteria pollutants: ozone (O<sub>3</sub>), particulate matter (PM<sub>2.5</sub> and PM<sub>10</sub>), nitrogen dioxide (NO<sub>2</sub>), carbon monoxide (CO), sulfur dioxide (SO<sub>2</sub>), and lead (Pb) (USEPA, 2016a). “[Wildfire] smoke is composed primarily of carbon dioxide, water vapor, carbon monoxide, particulate matter, hydrocarbons and other organic chemicals, nitrogen oxides, trace minerals and several thousand other compounds” (USEPA, 2001).

Communities exposed to wildfire smoke are advised to check current air quality information 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, older adults, children, pregnant women, smokers, and individuals with respiratory infections or diabetes are most at risk to wildfire smoke (Washington State Department of Health, 2017).

The nearest air quality monitoring station to the project area is in Ellensburg. The station has a current air quality advisory rating of “moderate” (WDE, 2017a), which indicates that “people with asthma, respiratory infection, diabetes, lung or heart disease, or have had a stroke may begin to have breathing problems” (WDE, 2013).

### **4.1.3 Climate**

Kittitas County and the Yakima River Basin are east of the Cascade Range in the rain shadow<sup>5</sup> and generally have warm, dry summers and cold, moist winters. During the winter, colder temperatures and higher precipitation occur in the Cascades and the surrounding foothills than in the Yakima River Basin. Cle Elum has an average annual precipitation of more than 22 inches. Average temperatures in degrees Fahrenheit range from the 20s in the winter to the range from highs in the 80s in the summer (NRCS, Undated). The five types of severe weather events that occur in Kittitas County are thunderstorms, damaging winds, hail storms, heavy snowfall associated with winter storms, and flash flooding (Kittitas County, 2012).

Global and regional climate conditions are expected to change in the coming decades. According to the Washington Climate Change Impacts Assessment (The Climate Impacts Group, 2009), temperatures could increase by 2 degrees (Fahrenheit) by the 2020s, 3.2 degrees by the 2040s, and 5.3 degrees by the 2080s. Because of increased summer temperature and decreased summer precipitation, the area burned by fire regionally is projected to double by the 2040s and triple by the 2080s (The Climate Impacts Group, 2009). 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 increasingly put communities in the WUI at risk (USEPA, 2016b).

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<sup>5</sup> Rain Shadow: “An area of reduced precipitation on the lee side of a mountain barrier caused by warming of air and dissipation of cloudiness as air descends the barrier.” (National Weather Service, 2009)

#### **4.1.4 Consequences of Alternatives**

##### ***No Action***

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/requirements, or as required by homeowners' insurance providers. There would be no impacts to 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 risks to proximate structures and infrastructure.

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 wildfires 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 an ecosystem, a large wildfire can release large amounts of greenhouse gases (GHG), thereby incrementally contributing to overall climate change. In 2015, a particularly bad year for wildfires in Washington, 12 to 46 million metric tons of carbon dioxide may have combusted due to wildfires. This would account for 13 to 50 percent of Washington's total average carbon emissions per year (Representative Tom Dent, 2015). Adverse impacts would range from minor to moderate, depending on the severity and location of a wildfire and subsequent air pollution, soil erosion, and carbon emissions.

##### ***Proposed Action***

Adverse impacts to geology and climate would be negligible based on the scale of the project and 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. The Proposed Action would result in beneficial impacts in the form of reduced erosion, by reducing the likelihood of wildfire burn scars, which are highly susceptible to erosion. Since the project does not involve changes in land use, no impacts to prime or unique farmlands would occur.

Fuels reduction activities would occur on a localized scale and focus on protection of structures in contiguous areas, thus likely reducing the spread or severity of wildfires. Reducing the risk or severity of wildfires would generally be a positive effect to air quality and climate conditions because of the consequent reduction in air pollution and GHG releases.



## **4.2 Water Resources**

### **4.2.1 Surface Water**

The Proposed Action is located in the Upper Yakima subbasin (Water Resource Inventory Area 39); each project area is within smaller nested subwatersheds and associated stream networks (WDE, 2015) (See Appendix A, Figures 2-5).

The Upper Yakima subbasin is situated on the eastern side of the Cascade Mountains in south-central Washington, and drains 1,594 square miles from its headwaters to its downstream boundary at Umtanum Creek. Headwaters begin in the Wenatchee National Forest, which is to the north and west of the Yakima River, and is predominantly forests and shrubs at elevations that reach more than 8,100 feet above sea level. Snowpack, glacier runoff, and precipitation account for most of the water used for irrigation and streamflow (WDE, 2005).

#### ***Sunlight Waters***

The Yakima River flows from northwest to southeast, less than 0.25 miles from the northernmost portion of Sunlight Waters. Several tributary streams flow adjacent to, or within, the project area, including Morrison Creek which abuts the western edge of Sunlight Waters, while the Main Canal for the Kittitas Reclamation District (KRD)<sup>6</sup> flows through the northern edge of Sunlight Waters (KRD, 2017a).

#### ***Middle Fork Teanaway***

The Middle Fork Teanaway River flows along the southern edge of this section of the project area; this tributary stream feeds into the Teanaway River, several miles southeast of the project location. Two tributaries to the North Fork Teanaway River converge in the northern portion of the project area, west of the intersection of Wagon Wheel Road and Spoke Lane. The Middle Fork Teanaway River is listed as a Shoreline of Statewide Significance<sup>7</sup> “from the Wenatchee National Forest boundary [downstream] to [the] mouth [of the] Teanaway River” (Washington State Legislature, 2011).

#### ***North Cle Elum Ridge***

Multiple streams flow throughout the North Cle Elum Ridge project area. In general, these waterbodies flow from north to south, eventually ending up in the Yakima River near the town of Cle Elum. From west to east, a tributary stream to Crystal Creek (south of the project areas), and a number of other unnamed tributaries are located in the area.

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<sup>6</sup> “Approximately two thirds of all the irrigated acres in Kittitas County, approximately 60,000 acres, are serviced by the KRD's 330 miles of canals and laterals. It is the 6th largest irrigation district in Washington State.” (KRD, 2017b)

<sup>7</sup> Shoreline of Statewide Significance: “The Shoreline Management Act (SMA) (RCW 90.58.030(2)(e)) defines a special category of shorelines where specific priority uses are preferred.” (WDE, 2017d)

### ***South Cle Elum Ridge***

Several tributaries to the Yakima River pass through the South Cle Elum Ridge neighborhood. From west to east, these include: Spex Arth Creek and its primary tributary which feeds in from the east, and Tillman Creek and its primary tributary which feeds in from the east. Both of these stream systems flow from south to north before converging with the Yakima River.

#### **4.2.2 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 waterbodies that do not meet water quality standards. Data from the Washington Department of Ecology (WDE) were queried to determine whether any streams in the project area are considered impaired or waters of concern. Waterbodies are classified by WDE as Category 1 thru 5, with Category 1 stream segments meeting tested standards for waters, and Category 5 stream segments are polluted waters that require water quality improvements.

- No streams in the Sunlight Waters project area were listed for any specific water quality concerns (WDE, 2017b).
- The Middle Fork Teanaway River is classified as a Category 4a waterbody for elevated temperature. Nearby Jack Creek, a tributary of the North Fork Teanaway River, is listed as a Category 1 waterbody for temperature (Jack Creek is located just outside of the project area) (WDE, 2017b).
- No streams in the South Cle Elum Ridge project area were listed for any specific water quality concerns (WDE, 2017b).
- No streams in the North Cle Elum Ridge project area were listed for any specific water quality concerns. However, a tributary to Crystal Creek passes through the project area; while this tributary is not listed for water quality concerns, Crystal Creek is currently listed as Category 4a for elevated levels of chlorine and ammonia, and Category 2 for diminished dissolved oxygen (WDE, 2017b).

WDE is currently conducting six water quality improvement projects to clean up waters within the Upper Yakima subbasin (Water Resource Inventory Area 39). Targeted pollutants emanate from runoff, sewer lines, and mine drainage. These improvement projects are located at: 1) Crystal Creek; 2) Selah Ditch; 3) Teanaway River segments; 4) Wilson/Cooke Creek tributaries; 5) Upper Yakima River; and 6) Yakima River. The Upper Yakima River Project has a USEPA- approved plan to improve water quality for the following pollutants and conditions: Dieldrin, DDT, suspended sediments, elevated turbidity, and elevated temperature (WDE, 2017c).

#### **4.2.3 Wetlands**

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

According to the U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory, approximately 42.8 acres of wetlands are located in the proposed project areas (USFWS, 2017a).

- Wetlands within Sunlight Waters include two freshwater ponds in the northern portion of the project area (7.7 acres of wetlands).
- Small pockets of wetlands within Middle Fork Teanaway are primarily in the southwestern portions of the project area (1.6 acres of freshwater emergent wetlands).
- Wetlands within South Cle Elum Ridge are primarily in the northwestern portion of the project area (Roughly 33.5 acres of freshwater emergent and freshwater forested/shrubland wetlands).
- There are no wetlands areas associated with North Cle Elum Ridge.

#### **4.2.4 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 following Flood Insurance Rate Maps apply to each of the project areas:

- Sunlight Waters – Panel 5300950406B (effective May 1981); this map shows the floodplains associated with the Yakima River that are designated Zone A, which is subject to inundation by the 1-percent-annual-chance flood event (100-year floodplain).
- Middle Fork Teanaway – Panel 5300950163B (effective May 1981); this map shows the floodplains associated with the Middle Fork Teanaway River that are designated as Zone A.
- South Cle Elum – Panels 5300950243B and 5300950244B (non-printed panels).
- North Cle Elum – Panels 5300950234B (effective May 1981), 5300950261B (effective May 1981), and 5300950261B (non-printed); Panel 5300950234B shows the floodplains associated with Crystal Creek that are designated as Zone A; Panel 5300950261B shows the Zone A floodplains associated with the Yakima River.

Kittitas County participates in the National Flood Insurance Program. Floodplain development permits are required prior to beginning any work on improved or unimproved properties within a 100-year floodplain. Floods and flood-related damage are common in Kittitas County. Kittitas County experienced eight federally declared flood disasters between 1975 and 2012, and the public and private costs have exceeded \$50 million. Additional non-federally declared flood disasters caused significant damage in 1998, 2006, and 2011. Kittitas County has significant floodplains located along the Yakima, Cle Elum, and Teanaway Rivers; all of these areas have a history of flooding (Kittitas County Department of Public Works, 2012).

## 4.2.5 Consequences of Alternatives

### *No Action*

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/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 less likely to contribute to post-burn erosion and sedimentation of water resources. In the event of a wildfire, impacts to the water quality, including sedimentation, 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 potential impacts to surface waters, no vegetation management activities would occur within 50 feet of a stream's OHWM for non-fish bearing streams and 75 feet for fish-bearing streams, consistent with typical Washington Department of Natural Resources forestry practices. These restrictions would minimize the release of sediments by limiting ground-disturbing activities near streams.

Long-term, minor adverse impacts to water quality, including temperature, chlorine, and ammonia concentrations, and dissolved oxygen, could occur but would be minimized by following the stream buffers described above. Vegetation removal in wetlands would be avoided. Riparian wetland areas would be avoided by restricting work within 50 to 75 feet of the OHWM of streams and within 100 feet of the OHWM for ESA fish-bearing streams. If work activities were not restricted in these waterbodies, there would be the potential for minor-to-moderate adverse impacts.

Impacts to floodplains or changes in flood hazards are not anticipated, largely because no construction or floodplain development is proposed. The stream buffers described above would be required and thus avoid some work in floodplains altogether. The Proposed Action would not increase flood elevations or velocities because modifications to stream banks would not occur and land in the floodplain would not be built up.

Because of the limited amount of vegetation that would be removed and low impact work and disposal methods, there is little potential for diminishing existing floodplain values. If work activities were not restricted in the stream buffers, there would be the potential for minor-to-moderate adverse impacts from sediment runoff. Vegetation removal in the WUI does not promote occupancy of the floodplain.

In the long term, the mitigated properties that maintain defensible space would be expected to be less vulnerable to catastrophic wildfires and 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 would be expected to have a minor positive affect to water resources from the reduced wildfire vulnerabilities in treated locations.

### 4.3 Biological Resources

#### 4.3.1 Vegetation

Vegetation in Kittitas County varies from forested, mountainous terrain in the Cascades to the dry, shrub-steppe hills in the Columbia Basin. Forestlands, primarily in the northwestern and northeastern parts of Kittitas County, comprise more than 50 percent of the County's vegetation cover. Agricultural lands are prevalent in the Yakima River Valley, which runs through the center of Kittitas County. Irrigated croplands include timothy hay, alfalfa hay, corn, potatoes, small grains, tree fruit, and livestock pasture. Shrublands dominate southeastern Kittitas County (Kittitas County, 2009).

The project areas fall within three USEPA Level III ecoregions: Columbia Plateau, Eastern Cascade Slopes and Foothills, and Northern Cascade. All three ecoregions rely on fires for forest and vegetation regeneration and to maintain ecological health of the plant communities (USEPA, 2017).

The project areas are on the eastern side of the Cascade Mountains. In lower elevation forested areas, Douglas-fir (*Pseudotsuga menziesii*) appears alongside ponderosa pine (*Pinus ponderosa*), lodgepole pine (*Pinus contorta*), and western larch (*Larix occidentalis*). Typical plants of the understory are common snowberry (*Symphoricarpos albus*), bitterbrush (*Purshia* sp.), and kinnikinnick (*Arctostaphylos uva-ursi*). Grand fir (*Abies grandis*) is common at middle elevations, while moist mountain meadows occur regularly in forest openings. Damp conditions on the upper North Cascade slopes promote growth of a closed-canopy conifer forest dominated by western hemlock (*Tsuga heterophylla*) and western red cedar (*Thuja plicata*) with a shrubby understory (huckleberries [*Vaccinium* sp.]), Oregon boxwood (*Paxistima myrsinites*), and western twinflower [*Linnaea borealis*]). Black cottonwood (*Populus trichocarpa*) typically occurs along streams, with groves of quaking aspen (*Populus tremuloides*) in wetter places. Lower elevation areas without forest have a range of grasses, forbs, and shrubs. Near residential areas, landscaping trees and shrubs may also be present (USGS, 2017).

Sunlight Waters is within the Columbia Plateau ecoregion. This area's vegetation is predominately sagebrush steppe and grassland, and the surrounding landscape is generally forested foothills. The project area contains some tree cover including ponderosa pine, but overall, there are more open areas with grasses, forbs, and small shrubs such as sagebrush (*Artemesia* sp.) and bitterbrush (*Purshia* sp.) (WDFW, 2008) (LandScope, 2017a) (USGS, 2017).

Middle Fork Teanaway and North Cle Elum Ridge are within the North Cascades ecoregion. Douglas fir, western hemlock, western red cedar, and ponderosa pine are the dominant tree species. Riparian species including alder and maple (*Acer* sp.) can be found along the Teanaway River. The understory of the forests varies but can contain deciduous shrubs and grasses (LandScope, 2017b) (USGS, 2017).

South Cle Elum Ridge is within the North Cascades and the Eastern Cascades Slopes and Foothills ecoregions. Vegetation ranges from ponderosa pine, grand fir, western hemlock, lodgepole pine,

Douglas fir, and an understory of shrubs and grasses, such as snowberry and Idaho fescue (*Festuca idahoensis*) (LandScope, 2017c) (USGS, 2017).

### 4.3.2 Wildlife and Fish

Kittitas County's wildlife species include mule deer (*Odocoileus hemionus*), coyote (*Canis latrans*), yellow-pine chipmunk (*Tamias amoenus*), Douglas' squirrel (*Tamiasciurus douglasii*), raccoon (*Procyon lotor*), common garter snake (*Thamnophis sirtalis*), northern flicker (*Colaptes auratus*), and American robin (*Turdus migratorius*). Other common, but less frequently encountered species include Rocky Mountain elk (*Cervus elaphus nelsoni*), black bear (*Ursus americanus*), cougar (*Puma concolor*), bobcat (*Lynx rufus*), short-tailed weasel (*Mustela erminia*), bald eagle (*Haliaeetus leucocephalus*), and rubber boa (*Charina bottae*). Fish species include anadromous species such as steelhead and salmon (*Oncorhynchus* sp.) and other freshwater fish such as rainbow and cutthroat trout (*Oncorhynchus* sp.), mountain whitefish (*Prosopium williamsoni*), carp (*Cyprinus* sp.), and bass (*Micropterus* sp.). (WDFW, 2005a) (WDFW, 2005b) (WDFW, 2005c) (Burke Museum, 2013) (WDFW, 2016a) (WDFW, 2017a) (WDFW, 2017b)

The 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.

Common MBTA bird species found in Kittitas County's mixed conifer forests include the red-tailed hawk (*Buteo jamaicensis*), northern flicker (*Colaptes auratus*), Steller's jay (*Cyanocitta stelleri*), mountain chickadee (*Poecile gambeli*), red-breasted nuthatch (*Sitta canadensis*), golden-crowned kinglet (*Regulus satrapa*), cedar waxwing (*Bombycilla cedrorum*), and brown-headed cowbird (*Molothrus ater*) (USFWS, 2013) (Kittitas County Audubon Society, 2017).

A list of MBTA species of particular conservation concern in Kittitas County is provided in Appendix C. Eastern Washington is part of the Pacific Flyway, and open water areas such as Cle Elum Lake are a stopover location for avian species. Ducks, geese, herons, egrets, grebes, and other water-loving birds congregate Kittitas County's open waters. The nesting season for migratory birds is generally from March through August, depending on species and location (WDFW, 2017c).

### 4.3.3 Threatened and Endangered Species and Critical Habitat

The Endangered Species Act 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 their actions do not jeopardize the continued existence of listed species, and do not adversely modify designated critical habitat.

The USFWS has identified threatened, endangered, and proposed species, and designated critical habitat with the potential to occur in the project areas (Table 2).

**Table 2: Federally Listed Wildlife Species**

Class	Species Name	Listing Status	Critical Habitat within Project Areas
Birds	Marbled murrelet ( <i>Brachyramphus marmoratus</i> )	Threatened	No
Birds	Northern spotted owl ( <i>Strix occidentalis caurina</i> )	Threatened	South Cle Elum Ridge
Birds	Yellow-billed cuckoo ( <i>Coccyzus americanus</i> )	Threatened	No
Fish	Bull trout ( <i>Salvelinus confluentus</i> )	Threatened	Middle Fork Teanaway
Fish	Steelhead ( <i>Oncorhynchus mykiss</i> )	Threatened	Middle Fork Teanaway
Mammals	Canada lynx ( <i>Lynx canadensis</i> )	Threatened	No
Mammals	Gray wolf ( <i>Canis lupus</i> )	Endangered	No
Mammals	North American wolverine ( <i>Gulo luscus</i> )	Proposed Threatened	No

Source: (USFWS, 2017b)

The following species are USFWS-listed for the project areas but have no potential to occur in the action areas due to lack of suitable habitat or extirpation of the species: marbled murrelet (habitat), yellow-billed cuckoo (extirpated), Canada lynx (habitat), and North American wolverine (habitat). Species that have critical habitat, or which could occur in the project areas, are discussed below; these species include the Northern spotted owl, bull trout, steelhead, and gray wolf.

***Northern Spotted Owl (Strix occidentalis caurina)***

Northern spotted owls are medium-sized owls, with dark eyes and brown feathers; feathers on their head, back, and underparts generally have white spots. The species inhabits forests with dense, closed canopies of mature and old-growth trees, abundant logs, standing snags, and live trees with broken tops. Northern spotted owls prefer older forest stands with a variety of tree ages, sizes, and structures, but would use areas with a variety of habitat types. The species often uses the open space among lower tree branches to allow flight under the forest canopy. Forests with a range of old growth, closed canopies, standing and fallen trees, and lower open areas for flight may not exhibit these combined characteristics until they are at least 150 to 200 years old (NatureServe, 2015) (WDFW, 2015) (USFWS, 2017c).

The Northern spotted owl feeds nocturnally on small mammals within arboreal habitat. The species typically nests within tree cavities and broken treetops in both living and dead trees. Breeding, nesting, and young rearing takes place from February through June. Incubation of the egg takes about 30 days, and young are able to leave the nest within 3 to 6 weeks; parents may continue to feed the young for several months following fledging (NatureServe, 2015) (WDFW, 2015) (USFWS, 2017c).

Loss of forest habitat is a major threat to the species' distribution and recovery. Another threat is the barred owl (*Strix varia*), which directly competes for habitat and foraging resources. Nesting, hunting, and roosting habitat for Northern spotted owls could be present within Middle Fork Teanaway, North Cle Elum Ridge, and South Cle Elum Ridge; all project areas occur within WDFW Northern Spotted Owl Management Buffers. Designated critical habitat for the Northern spotted owl is within, and directly adjacent to, South Cle Elum Ridge. Figure E-3 (within Appendix E's Biological Assessment) shows the project areas where Northern spotted owl conservation habitat and critical habitat are present. Conservation habitat provided by WDNR shows nesting, roosting, and foraging habitat areas. The WDFW has identified Northern spotted owl occurrence and nesting area habitat within the project areas, but map data cannot be released to show some of the specific areas (WDFW, 2015) (USFWS, 2017b) (USFWS, 2017c).

For more details about Northern spotted owl see Appendix E, Biological Assessment.

### ***Bull Trout (Salvelinus confluentus)***

Bull trout are commonly called a "trout" but the fish are more closely related to char (*Salvelinus* sp.), such as lake trout (*Salvelinus namaycush*), brook trout (*Salvelinus fontinalis*), and Arctic char (*Salvelinus alpinus*). Bull trout are distinguished from rainbow or cutthroat trout (*Oncorhynchus* sp.) by their darker body color with light spots, as opposed to "true trout" which have darker spots on a lighter background. Mature fish range between 12 and 20 inches. 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, Jeanes, Beamer, & (Eds), 2004). The habitat components required by bull trout are described as "cold, clean, complex, and connected" (USFWS, 2010). Bull trout exhibit patchy distributions because even under pristine conditions, the required habitat components are not ubiquitous throughout river basins (WDFW Fish Program, 2000) (USFWS, 2010) (WDFW, 2017d).

Bull trout feed on aquatic insects and macrozooplankton when young, and primarily eat other fish as adults, although bull trout would also eat small animals such as mice, frogs, ducklings, or snakes. Some populations of bull trout are migratory, living in larger bodies of water and moving upstream into smaller tributaries to spawn. Spawning generally occurs from late summer to fall and eggs incubate through the winter. Bull trout eggs hatch in late winter or early spring and fry (newly hatched fish) leave the spawning gravel nests (redds) in April or May. Redds must consist of clean, silt free gravel with very cold water temperatures (i.e., below 48 degrees Fahrenheit). (NatureServe, 2015) (WDFW, 2015) (USFWS, 2017d)

Threats to bull trout include increased water temperature due to streamside vegetation loss, and sediment accumulation in spawning gravel. All four project areas fall within the Middle Columbia River Recovery Unit, which is part of the Yakima River Basin, for bull trout. The Yakima River Basin is considered a "core area" by USFWS as part of the Mid-Columbia Recovery Unit Implementation Plan for Bull Trout. The Middle Fork Teanaway project area has designated critical habitat for bull trout. However, the Teanaway River population is considered functionally extirpated (locally extinct), although there are occasional observations of a spawning redd or occurrence of single bull trout. (USFWS, 2015a)



### ***Steelhead (Oncorhynchus mykiss)***

Steelhead are an anadromous trout (*Oncorhynchus* sp.), related to salmon and cutthroat trout. Unlike salmon, steelhead would make more than one spawning migration from the ocean to their natal waters. Steelhead leave the salt water habitat, migrate upstream to the freshwater habitat where they hatched, spawn, and return back to the sea. Steelhead look similar to rainbow trout but are much larger, weighing 8 to 11 pounds (average), though they can grow as large as 40 pounds. Rainbow trout are the same species (*Oncorhynchus mykiss*) as steelhead; however, rainbow trout never migrate from freshwater. The steelhead species has a complex life history and seasonal spawning runs. Steelhead need clean cold water for eggs, young, and smolt<sup>8</sup> to develop and thrive. Young steelhead eat invertebrates, salmon eggs, and small fish. (NatureServe, 2015) (WDFW, 2017e)

The Middle Columbia River steelhead Evolutionarily Significant Unit (ESU) occurs within the project areas. The National Oceanographic and Atmospheric Administration (NOAA) Fisheries defines an ESU as “a group of populations that are substantially reproductively isolated from other populations, and represent an important component in the evolutionary legacy of the biological species” (NOAA Fisheries, 2011). The Middle Columbia River ESU includes the steelhead population up to and including the Yakima River. Almost all steelhead populations within this ESU are summer-run fish including those in the project area. A balance between 1- and 2- year old smolt outmigrants characterize most of the populations within this ESU. Adults return after one or two years at sea. Hatchery production of steelhead in the Yakima River system was relatively limited historically and phased out in the early 1990s (NMFS, 2009).

Threats to steelhead include habitat loss or degradation from dams, stream crossings, culverts, and removal or damage of riparian vegetation. In addition, decades of agriculture in the Yakima Valley have affected habitat quality for steelhead. The Middle Fork Teanaway project area contains steelhead critical habitat. The nearby Yakima River, of which the Teanaway River is a tributary, also has summer and winter runs of steelhead. (NOAA Fisheries, 2011) (WDFW, 2015)

### ***Gray Wolf***

The gray wolf resembles a large dog. Gray wolves are characterized by their large size (80 to 100 pounds), straight tail, rounded and upright ears, broad snout, and light gray to black color. Gray wolves typically inhabit areas that support large ungulates (e.g., deer, elk, pronghorn, etc.), and show some tolerance to human presence. (Wiles, Allen, & Hayes, 2011) (NatureServe, 2015)

Gray wolves are nocturnal and generally hunt in packs. Their primary prey includes deer, elk, and pronghorn, as well as other smaller mammals and carrion (i.e., dead animals). Gray wolves are social and maintain territories specific to their pack unit. Gray wolves in the northwest tend to breed in February and give birth to litters of 4 to 6 pups, about 3 months following breeding. Pups are weaned after about 5 weeks and leave the den after at 3 months of age. Dens typically include

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<sup>8</sup> Smolt: “A juvenile salmonid that is undergoing physiological and behavioral changes to adapt from freshwater to saltwater as it migrates toward the ocean.” (NOAA Fisheries, 2017)

underground burrows; hollow trees or shallow caves may be used to give birth and rear the pups. (Wiles, Allen, & Hayes, 2011) (NatureServe, 2015)

The greatest threat to gray wolves is human-caused mortality. All four project areas could support gray wolves; however, wolves use non-residential State or Federal lands predominately over developed or residential areas. The Teanaway wolf pack’s territory overlaps the Middle Fork Teanaway project area. There is no critical habitat for gray wolves within or surrounding the project areas. (Wiles, Allen, & Hayes, 2011) (Becker, et al., 2016) (WDFW, 2017f)

#### 4.3.4 Other Special Status Species

The WDFW maintains a list of State-listed threatened, endangered, candidate, or sensitive species. Included on the 2016 State list for threatened, endangered, and sensitive species are 18 mammals, 14 birds, 4 reptiles, 3 amphibians, 3 fish, and 3 invertebrates; an additional 112 species were designated as candidates for State listing. (WDFW, 2016b)

State listed and candidate species that have habitat within the project areas are shown in Table 3.

**Table 3: State Listed Wildlife Species**

Class	Species Name	Listing Status	Critical Habitat within Project Areas
Birds	Northern spotted owl ( <i>Strix occidentalis caurina</i> )	Endangered	South Cle Elum Ridge, North Cle Elum Ridge, Middle Fork Teanaway
Fish	Bull trout ( <i>Salvelinus confluentus</i> )	Candidate	Middle Fork Teanaway
Fish	Chinook salmon ( <i>Oncorhynchus tshawytscha</i> )	Candidate	Middle Fork Teanaway
Fish	Steelhead ( <i>Oncorhynchus mykiss</i> )	Threatened	Middle Fork Teanaway

Source: (WDFW, 2016b) (Bell, 2017)

#### 4.3.5 Consequences of Alternatives

##### *No Action*

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/requirements, or as required by homeowner’s insurance providers. The existing high risk of vegetation loss from catastrophic wildfires would continue, as would vulnerabilities to biological resources (e.g., vegetation, wildlife, and fish).

Small-scale vegetation management activities could cause minor, localized, and temporary disturbance to wildlife, including federally 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 wildfires.

### ***Proposed Action***

#### *Vegetation*

As defensible spaces are established and maintained, disturbances from work crews, removal of small trees and brush, and hand pruning or limbing may result in local, indirect, small adverse effects to native plant communities. Vegetation types to be treated include ponderosa pine, Douglas fir, lodgepole pine, sagebrush, bitterbrush, and invasive plant species. However, many of the properties to be treated have non-native ornamental or weedy species. Trimming or removing these plants would not negatively affect native plant communities. These activities would be completed by hand and result in negligible ground-disturbance; as such, the potential for adding new invasive plant species populations or enhancing existing populations is low.

No permanent conversion of forested habitat to other types of habitat would be anticipated as part of the Proposed Action. The project area would remain as upland forest habitat, and wildlife habitat would remain intact. The Proposed Action would focus only on limited thinning of existing forest and removing biomass near structures.

#### *Wildlife, Fish and Threatened and Endangered Species*

Creation of defensible spaces could have minor, localized, and scattered impacts to 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.

Temporary disturbance to wildlife could occur from the presence of workers and by the equipment used (e.g., chainsaws, chippers, brush mowers, masticators). Disturbances are anticipated to be of short duration (no more than a few days), resulting in temporary avoidance of the affected areas by wildlife. To reduce adverse effects on wildlife habitat, treatment prescriptions beyond the immediate structure defensible space and for larger parcels will incorporate wildlife habitat best management practices included in the Woodland Fish and Wildlife Group's *Wildlife-Friendly Fuels Reduction in Dry Forests of the Pacific Northwest* (Strong, Bevis, & Bracher, 2016). These include leaving select snags, shrubs, and vegetative clumps; and piling vegetative debris. The KCCD may also consult with WDFW as needed in particular for larger parcels, to further incorporate habitat features into treatment prescriptions. Additional disturbance could occur periodically during the 10-year maintenance period. Impacts to wildlife from the temporary disturbance would be considered minor because of the short duration of work on any given parcel and due to the limited radius of activities.

Work that occurs during the summer bird breeding season (generally from March through August) could have minor impacts on nesting birds and birds protected under the MBTA. Disturbances could result in abandonment of nests or displacement from preferred foraging areas, which would affect ground- 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, could be disproportionately affected because of the emphasis on removal of dead or dying trees (snags). To minimize the

potential for migratory bird effects, the above noted best practices will be followed and initial treatment activities would be precluded during the nesting season (March-August), unless a project site survey determines there would be no migratory birds affected by treatment activities.. Small mammals and reptiles could lose some habitat as a result of the removal of downed wood.

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

Northern spotted owl habitat has been identified in the North and South Cle Elum Ridge and Middle Fork Teanaway project areas (Bell, 2017); and WDFW management buffers cover all four project areas. Due to the developed nature of the project areas, trees would likely be young, single-layered, and too densely forested to be highly suitable for northern spotted owls. In addition, houses are present throughout these areas, making the project areas less desirable nesting habitat for owls. The sites could be suitable for dispersal of northern spotted owls, but are not likely to contain standing snags or live trees with broken tops large enough for nesting.

The Proposed Action could benefit northern spotted owls in the long term. Wildfire appears to be the leading cause of habitat loss for the northern spotted owl (Davis, Dugger, Mohoric, Evers, & Aney, 2011). Reducing the risk of wildfire could prevent catastrophic wildfires in the project area, and therefore prevent loss of existing forest stands.

There would be no impact to ESA-listed aquatic species (e.g., bull trout, steelhead) because of the prohibition on removal of 8-inch dbh or larger trees within 100 feet of the OHWM of the Middle Fork Teanaway River or its tributaries, as well as the 75 feet of OHWM vegetative work restriction discussed in Section 4.2.5.

Impacts to the gray wolf are not anticipated because of the location, low impact nature, and short duration of work. The Proposed Action is similar to the ongoing human activity in these residential areas and the wolves, which are shy by nature, would likely avoid these disturbances.

For more details about ESA-listed species, see Appendix E, Biological Assessment. Consultation has been completed with the USFWS on findings of the Biological Assessment, see Appendix F, with USFWS concurrence provided on June 2, 2017.

#### **4.4 Cultural Resources**

Cultural resources consist of locations of human activity, occupation, or use identified through field inventory, historic documentation, or oral evidence. The term encompasses historic properties as defined by the National Register of Historic Places (NRHP). Multiple Federal statutes and regulations require consideration of the effects of an agency's undertakings on historic properties.

Among the historic preservation laws and regulations, the primary mandate for FEMA's proposed funding of this vegetative fuels reduction project and interaction with NEPA is the National Historic Preservation Act of 1966, as amended (54 U.S.C. 300101 et seq. [formerly 16 U.S.C. § 470 et seq.], and particularly Section 106. Section 106 of the NHPA and its implementing regulations (36 CFR § 800) direct Federal agencies to consider the effects of their undertakings on historic properties. An undertaking, in the context of Section 106 and as used throughout this document, refers to a "project, activity, or program funded in whole or in part under the direct or

indirect jurisdiction of a Federal agency, including those carried out by or on behalf of a Federal agency; those carried out with Federal financial assistance; and those requiring a Federal permit, license or approval” (36 CFR § 800.16(y)). The State Historic Preservation Officer (SHPO) is the Federal agency’s primary Section 106 consulting party.

In accordance with Section 106, FEMA has delineated the Area of Potential Effects (APE) for the project area as approximately 9,350 acres encompassing 560 structures in the Sunlight Waters, Middle Fork Teanaway, North Cle Elum Ridge, and South Cle Elum Ridge areas (Appendix A, Figure 1).

#### **4.4.1 Ethnographic and Historical Context**

##### ***Ethnographic Period***

The ethnohistoric period in the area began with early contacts between Native American groups and Euroamerican explorers. As documented during this period, the project areas were within the territory of the Kittitas, a Sahaptin-speaking group who occupied the Upper Yakima Valley north of Selah, to Snoqualmine Pass, and north to the Wenatchee Range. Kittitas territory was bounded to the north by that of the Wenatchee, to the east by the Sinkause, and to the south by the Yakima (Miller, 1998). The largest settlement in this territory contained approximately 500 people, and was near the present town of Thorp; another settlement of similar size was approximately 7 miles from Ellensburg. Additional important summer habitation locations included Kittitas, approximately two miles from Ellensburg, and another location on the banks of Cle Elum Lake, occupied by almost 1,000 people (Schuster, 1998). The June 1814 summer gathering at Kittitas included almost 3,000 people, and covered more than 6 miles in every direction (Ross, 1855). In addition, a mid-1800s description of another summer encampment, near modern-day Teanaway, described a large gathering location for trading and other social activities (Desmond, 1952).

The Kittitas were semi-nomadic, and their primary subsistence activity was fishing, supplemented by hunting and gathering. They practiced a seasonal subsistence and settlement system that included wintering in semi-permanent villages along the Columbia River and its tributaries. Salmon was of primary importance, with the first run coming in mid-spring, and a larger run starting mid-summer. Groups of people would gather during this time at established fishing stations. Kittitas territory had a fishing site on the banks of Cle Elum Lake, where up to 1,000 individuals, including the Kittitas, Yakima, Wenatchi, and Columbia peoples, gathered to catch salmon. (Anastasio, 1985)

As summer progressed, families established small camps at higher elevations to gather berries, bulbs, roots, and nuts. Near the beginning of August, groups convened at the camas (i.e., roots) grounds in the Kittitas Valley to gather bulbs (Schuster, 1998). At the onset of fall, families returned to lower elevations along rivers to prepare for the winter. This pattern of subsistence and settlement was established throughout prehistory and persisted into the ethnographic period, until Euroamerican settlement and subsequent establishment of reservations resulted in a disruption to the native economy in the Columbia Plateau by the middle of the nineteenth century.

## ***Historic Period***

Euroamerican fur traders were among the first non-Native Americans to frequent the Kittitas Valley during the early 1800s, with early accounts by Alexander Ross of the Pacific Fur Company and David Thompson of the North West Company describing previous evidence of contact with Europeans in the form of trade goods and smallpox. With the establishment of the Hudson's Bay Company's Fort Vancouver in 1825 and Fort Nisqually in 1833, the Kittitas trade with Europeans became more direct and frequent. Soon after the decline of the fur trade, missionaries began to inhabit the region. Fathers Charles-Marie Pandosy, Eugene Chirouse, and G. Blanchet are considered the first permanent non-Native American settlers in the valley, establishing a mission on Manastash Creek near Ellenburg in 1848. (Schuster, 1998)

## ***Ranching***

The earliest arrival of cattle herds in the Yakima Valley were those brought to the area around 1840 by Yakima leader, Kamiakin, with more cattle arriving shortly thereafter by Kittitas chief, Owhi. Within 2 years of the establishment of Washington Territory, Governor Isaac Stevens signed a treaty on June 9, 1855, with Yakama Chief Kamiakin and other tribal leaders, ceding almost 11 million acres of their lands. Increased non-Native American settlement occurred within the ceded lands as cattle ranchers patented land claims in the Kittitas Valley during the 1860s. The abundant bunchgrass and clear streams of the Kittitas Valley gave rise to a prosperous cattle industry. As early as 1861, non-Native American ranchers from the Yakima Valley grazed their cattle in the Kittitas Valley. (Ochran, 2014)

A wagon road over Snoqualmie Pass was completed in 1867, which allowed ranchers easy, dependable access to larger markets to sell their cattle. Over the next decade, new ranches flourished and large cattle herds grazed freely. The resulting overproduction led to declining beef prices, which returned to earlier levels after the severe winter in 1880-1881, which killed more than half of the herds. Although the number of cattle eventually returned to early levels, overgrazing was beginning to affect the range. As a result, the Federal government began to regulate grazing in 1897, which led to a gradual shift from open grazing to fenced pastures and hay feeding. (Ochran, 2014)

## ***Mining***

In 1867, prospectors encountered gold around Swauk Creek, contributing to an increase in development after the establishment of the Swauk Mining District in 1873. Homesteaders discovered coal in 1883, and mining began shortly thereafter in the Cle Elum River Valley and surrounding mountains. Early miners extracted coal with picks, hoisted it from shafts by basket and rope, and shoveled it onto wagons by hand; mules and mule skinnners were later added to the transportation process. (Ochran, 2014) (Schuster, 1998)

In 1886, the Northern Pacific Company began to actively develop the region's coal deposits, constructing a railway to Cle Elum and Roslyn to transport coal shipments to the west. At the turn of the century, several large coal concerns were mining more than a million tons of coal annually, with production peaking in the 1920s as companies introduced modern extractors, loaders and conveyors, and electric locomotives. Mining declined in the 1930s due to competition from oil

producers; in 1963, the last mine closed in the region. More than 50 million tons of coal had been extracted and shipped from the Roslyn-Cle Elum coalfield. (Ochran, 2014)

### ***Community Development***

Frederick Ludi and John Goller were among the first Euroamerican settlers in the Kittitas Valley; in 1867, they built a trading post at the site of present-day Ellensburg. By 1883, a few businesses were established, and the town was designated as the seat of Kittitas County. The Northern Pacific Railroad arrived in 1886, and the town became a center for commerce, banking, farming, and ranching in the Kittitas Valley.

By the early 1900s, agriculture began to replace ranching as the area's primary industry; completion of several irrigation projects spurred growth of the local fruit economy. The Chicago, Milwaukee & St. Paul Railroad arrived in Kittitas County in 1909. By the 1920s, automobile routes were established, facilitating transportation of goods to and from Seattle. In 1923, the first official Ellensburg Rodeo was held in conjunction with the Kittitas County Fair and is a continuing tradition. (Becker, P., 2005a) (Becker, P., 2005b)

Recent developments, including Sunlight Waters, Middle Fork Teanaway, North Cle Elum Ridge, and South Cle Elum Ridge, were established in the 1970s and 1980s.

#### **4.4.2 Identification of Historic Properties**

Identification of historic properties was completed by David R. Cohen, Ph.D., RPA, a professional archaeologist with Booz Allen Hamilton, who meets the Secretary of the Interior's Professional Qualification Standards for his discipline. Analysis was based on the review of digital photographs, available materials collected during a desktop review, and a confidential search of the Washington Information System for Architectural and Archaeological Records Data (WISAARD). The WISAARD search was conducted on January 23, 2017, to determine the presence or absence of previously recorded properties and the extent of survey coverage in and near the APE.

#### ***Above-ground Resources***

##### ***Sunlight Waters***

No previously documented historic properties are present within Sunlight Waters. Based on available WISAARD data, there are at least two recorded above-ground cultural resources in the project area's vicinity. Those two resources are remains of wooden historic structures with associated scattered artifacts (KT00838 and KT00806). None of these resources have previously been evaluated for eligibility for the NRHP.

##### ***Middle Fork Teanaway***

No previously documented historic properties are present within Middle Fork Teanaway or its immediate vicinity.

### *North Cle Elum Ridge*

Two previously documented historic properties associated with historic coal mining activities within the Swauk Mining District, Canyon Arrow Air Shaft Number 7 mine (KT02072) and the NWI Coal Company Mine No. 5 Tailing and Slag Features (KT03054), are present within the North Cle Elum Ridge project area. Both resources have been evaluated for the NRHP. The Canyon Arrow Air Shaft Number 7 was determined to be potentially eligible for listing, and the NWI Coal Company Mine No. 5 Tailing and Slag Features was determined not eligible.

Based on available WISAARD data, there is one recorded above-ground cultural resource in the immediate vicinity of the project area associated with historic coal mining (KT01960), with numerous others in the general area.

### *South Cle Elum*

No previously documented historic properties are present within South Cle Elum or its immediate vicinity.

## ***Archaeological Resources***

### *Sunlight Waters*

No cultural resource surveys have occurred within Sunlight Waters, and there are no recorded archaeological sites. Based on available WISAARD data, three cultural resources with archaeological components have been recorded within the vicinity of the project area; none have been evaluated for the NRHP. One resource (KT00841) consists of a disbursed pre-contact lithic scatter of approximately 23 x 22 meters, with no other recorded prehistoric habitation materials. The other two resources (KT00838 and KT00806) are remnants of small historic habitations consisting of the remains of two shacks, rock structure foundations, apple trees, and remnants of discarded cans and bottles.

### *Middle Fork Teanaway*

No previously documented archaeological sites are present, and no previous cultural resource surveys have occurred, within Middle Fork Teanaway or its immediate vicinity.

### *North Cle Elum Ridge*

No cultural resource surveys have occurred within North Cle Elum Ridge, with only one having been conducted in the vicinity (de Forest Miller, 1998). This previous inventory recorded one isolated white chert flake (KT01359) over 1,000 feet away from the project area, with no associated archaeological site.

### *South Cle Elum Ridge*

One previous pedestrian cultural resource survey occurred within the project area covering approximately 90 acres (de Forest Miller, 1997), yielding no cultural resources. Other portions of the project area have not been surveyed.



#### 4.4.3 Summary of Documented Cultural Resources

The cultural resources found within the project area are listed in Table 4-4. Seven archaeological resources consisting of historic-era sites (including coal mining infrastructure, refuse scatter, homestead) and one pre-contact-era site (including a lithic scatter) are found in the project area. Sunlight Waters, Middle Fork Teanaway, North Cle Elum Ridge, and South Cle Elum Ridge were established in the 1970s and 1980s.

Previous cultural resource evaluations are rare, primarily because the lands are privately held. However, previous inventories have occurred within a small portion of South Cle Elum Ridge, yielding negative results. Because the greater project area has a variety of historic and some pre-contact sites, similar resources would be expected within areas that have never been inventoried for cultural resources. Mining-related features are expected in the North Cle Elum Ridge subdivision given its proximity to the Northwestern Improvement Company (NWI) Coal Mine No. 5, Tailing and Slag features and the Canyon Arrow Air Shaft, and Number 7 Mine’s location within the project area. Each of the four project areas is likely to contain evidence for pre-contact use given the variety of sensitive landforms present, including rivers, streams, knolls, rock outcrops, and prairies.

**Table 4: Previously Documented Cultural Resources within the Project Area Vicinity**

Site No.	Name	Description	NRHP Eligibility	Project Component
KT00841	Pre Contact Lithic Material	Lithic scatter, 23m x 22m	Not evaluated	Sunlight Waters
KT00838	Historic Structures Not Specified	Rock alignment that appears to be structure foundation; apple trees, can, bottle glass	Not evaluated	Sunlight Waters
KT00806	Historic Structures Not Specified	Remnants of 2 railroad tie shack/lean-tos; several depressions, scattered construction debris	Not evaluated	Sunlight Waters
KT01359	Pre Contact Lithic Material	Isolated white chert flake, 2 cm x 1 cm	Not evaluated	Sunlight Waters
KT01960	No. 7 Coal Mining Complex	Historic mining property, 80m x 100m	Not Eligible	North Cle Elum Ridge
KT02072	Canyon Arrow Air Shaft, Number 7 Mine	Historic Mining Property; 88cm X 80cm	Potentially Eligible	North Cle Elum Ridge

#### **4.4.4 Native American Consultation**

Consistent with Section 106, Native American consultation to identify potential impacts of the proposed undertaking on cultural or religious resources that are significant to tribes is also needed. Two tribes have been identified for consultation in Kittitas County:

- Confederated Tribes and Bands of the Yakama Nation,
- Confederated Tribes of the Colville Reservation

#### **4.4.5 Consequences of Alternatives**

##### ***No Action Alternative***

Under the No Action Alternative, FEMA would not provide funding to reduce fuels in selected areas of Kittitas County. However, some wildfire mitigation activities would be expected to continue as initiated by property owners, through existing local programs/requirements, or as required by homeowner 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 historic properties in the project areas 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 in four subdivisions in Kittitas 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. Contractors would conduct vegetation removal activities by hand, including thinning and trimming. Vegetative debris would be chipped or piled onsite or may be disposed offsite at a facility authorized for vegetative debris disposal. Ground-disturbing activities with the potential to impact cultural resources associated with the project are therefore expected to be limited.

##### ***Above-ground Resources***

The No. 7 Coal Mining Complex (KT01960) and Canyon Arrow Air Shaft Number 7 Mine (KT02072) both have an above-ground component, with KT02072 being determined to be potentially eligible for listing in the NRHP. However, due to the low impacts of the project activities, FEMA has determined that the Proposed Action does not have the potential to directly or indirectly impact above-ground resources. Work on structures is not proposed, and no other recorded above-ground cultural resources are within the project APE. The Proposed Action would benefit above-ground historic resources by reducing vulnerabilities from wildfires.

##### ***Archaeological Resources***

The Proposed Action would occur in areas generally considered to be archaeologically sensitive, where surface or deeply buried cultural resources could be present, as evidenced by the previously

recorded sites within and in close proximity to the project area. Additional sites are likely present that have not yet been documented.

Although direct impacts to previously documented sites are not anticipated, Kittitas County would be required to avoid these resources as a precaution to prevent even minor potential disturbances such as pedestrian traffic. To reduce the potential for impacts to cultural resources, the Proposed Action would be conditioned so that if used, tracked machinery and vehicles would work from existing roads as much as possible, and work would be conducted during dry periods. Vegetative debris would be hauled manually to the machinery staged on roads. The vegetation thinning and trimming around residential structures and outbuildings would have little potential to affect archaeological resources because of the proposed low impact methods. FEMA has determined that no additional identification or evaluation efforts are necessary, and that the Proposed Action would have no effect on historic properties.

FEMA requires that all 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 of the NHPA, all work is 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 a formal letter to the SHPO on March 1, 2017, and received a concurrence on March 1, 2017 (Appendix G). Additionally, Section 106 consultation letters, dated March 1, 2017, were provided to the Confederated Tribes and Bands of the Yakama Nation and Confederated Tribes of Colville Reservation (Appendix I).

On March 1, 2017, the Confederated Tribes of Colville Reservation responded, indicating that “given the low impact level, the Colville Tribes are not recommending a cultural resources inventory that includes pedestrian survey.” No response has been received to date from the Yakama Nation.

## **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 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 home and safely evacuate.

It is important for the public to stay informed on the current risk of wildfire in their community and discuss an evacuation plan with their family and neighbors. Many local and State use media resources (e.g., television, radio, newspaper, internet); telephone numbers; local emergency response offices; and word of mouth to inform the public on wildfire risk in their area.

## **4.5.2 Environmental Justice**

EO 12898, Environmental Justice, 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 could have disproportionate impacts on minority or low income persons.

Data from the 2015 Census American Community Survey 5-year estimates for Kittitas County were used to identify the minority and low income population compositions of the Census Tracts which encompass the project area. The Middle Fork Teanaway and North Cle Elum Ridge communities lie in Census Tract 9751, while the South Cle Elum Ridge and Sunlight Waters communities lie in Census Tract 9752. In Census Tracts 9751 and 9752, total minority population was approximately 11 percent and 10 percent, respectively. The total minority population was 19 percent in Kittitas County and 34 percent in Washington. In Census Tracts 9751 and 9752, the poverty rate was approximately 12 percent and 8 percent, respectively. The poverty rate was 22 percent in Kittitas County and 13 percent in Washington (U.S. Census Bureau, 2015). Because the poverty and minority levels are lower in the project area Census Tracts than in Kittitas County or Washington, a detailed analysis for impacts to minority and low-income populations is not required under EO 12898.

## **4.5.3 Consequences of Alternatives**

### ***No Action Alternative***

Under the No Action Alternative, FEMA would not provide funding to reduce fuels. Some wildfire mitigation activities, however, would still be expected to continue, whether by property owners, through existing local programs/requirements, or as required by homeowner's insurance providers. In the event of a wildfire, there would be increased risk to public safety and emergency responders in these extreme risk communities.

Rough gravel roads, steep slopes and canyons, and inadequate fire flow would likely make evacuation and emergency response activities in these communities more challenging. The entire affected population near the project area, including minority and low income populations, would not benefit from a reduction in wildfire risk.

### ***Proposed Action***

Properties containing maintained defensible space are expected to be less vulnerable to damage from catastrophic wildfires. Reducing the risk or severity of wildfires is generally a positive effect to public safety and emergency responders due to the 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, and demographics were not a factor in site selection. Minority and low income populations would benefit equally to the entire affected population from a reduction in wildfire risk.

## 4.6 Recreation

Kittitas County is home to many recreational activities (e.g., biking, boating, birding, camping, climbing, fishing, golfing, hiking, horseback riding, hunting, kayaking, and skiing). The following recreational areas are adjacent to or near the project area:

- *Okanogan-Wenatchee National Forest.* This national forest has more than 4 million acres and is situated along the eastern slopes of the Cascade Mountains. The Okanogan-Wenatchee National Forest stretches 180 miles from the Canadian border to Goat Rocks Wilderness and ranges from glaciated alpine peaks, valleys of old-growth forest, and shrub-steppe conditions on the eastern edge. The basin contains marshes and meadows associated with Upper Klamath Lake and the Williamson River. The Naches and Cle Elum Ranger Districts surround the city of Cle Elum to the North, South, and West. Speelyi Beach Park is along the southern shore of Cle Elum Lake in the Cle Elum Ranger District (USFS, 2017). The Naches Ranger District of the Okanogan- Wenatchee National Forest directly abuts the South Cle Elum Ridge community to the south and west. A parcel of the Okanogan-Wenatchee National Forest, the Taneum Campground, also lies approximately 2.5 miles to the west by southwest of the Sunlight Waters community. The neighboring Cle Elum Ranger District of the Okanogan-Wenatchee National Forest lies to the north of the project area, approximately 2 miles from the Middle Fork Teanaway community.
- *Teanaway Community Forest.* This State owned forest, managed jointly by WDNR and WDFW, covers 50,241 acres, and is located at the headwaters of the Upper Yakima sub-basin between Cle Elum Lake and U.S. Highway 97. Teanaway West Fork, Indian Camp, and 29 Pines Campgrounds are free and open to the public. Trailheads to several trails in nearby national forests are within a community park (WDNR, 2017b). The Middle Fork Teanaway community is nearly surrounded by the Teanaway Community Forest. The Teanaway Community Forest boundary lies approximately 0.25 miles north of the North Cle Elum Ridge community.
- *Suncadia Resort.* This planned unincorporated resort community for permanent residents and visitors is on the southern shore of Cle Elum Lake, 2 miles west of Cle Elum, and covers approximately 6,000 acres. The resort contains two golf courses, hiking trails, and equestrian trails (Suncadia Resort, 2017). The resort is approximately 1.25 miles west of the North Cle Elum Ridge community and 2.5 miles north of the South Cle Elum Ridge community.
- *Washington State Horse Park.* This park is on 112 acres of gently sloping terrain and is used primarily for equestrian activities. The park has 23 recreational vehicle hookup sites and spaces for tent camping (Washington State Horse Park, 2017). The park is approximately 1 mile southwest of the North Cle Elum Ridge community and 2 miles north of the South Cle Elum Ridge community.
- *L.T. Murray Wildlife Area.* The L.T. Murray Unit of the L.T. Murray Wildlife Area is 54,070 acres and is owned by WDFW, WDNR, and the USFS. The L.T. Wildlife Area is comprised primarily of conifer forest, along with shrub steppe and riparian corridors. Hunting, fishing, camping, and wildlife watching are popular activities on the property (WDFW, 2017g). The L.T. Murray Wildlife Area is south of the project area, and abuts the

eastern edge of the Naches Ranger District of the Okanogan-Wenatchee National Forest. Parcels of this area are 2.75 miles to the west and 1.75 miles to the south of Sunlight Waters.

#### **4.6.1 Consequences of Alternatives**

##### ***No Action Alternative***

Under the No Action Alternative, FEMA would not provide funding to reduce fuels. Some wildfire mitigation activities, however, would still be expected to continue, whether by property owners, through existing local programs/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 avoid recreational areas because private property is targeted in residential areas. Vegetation removal activities would be coordinated with recreational facility managing agencies, if necessary. Thinning of trees and shrubs is not anticipated to adversely affect recreational activities or viewpoints. Impacts would be negligible and temporary.

Depending on the location and size of treated properties, the Proposed Action could provide some minor benefits to recreational areas by complementing concurrent wildfire mitigation efforts that occur within them to further 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.

Resilience to wildfire hazards in particular on a meaningful geographic scale hinges on implementation of variety of complimentary mitigation activities thus resulting in cumulative benefits. Ongoing wildfire mitigation activities on neighboring tracts of land, as initiated by residential landowners and private, local, State, or Federal entities would further reduce the possibility of an intense and widespread wildfire in the project area. Recently, each community treated (i.e., fuel reduction and chipping) the following percentage of its total lots: Sunlight Waters (17%), Middle Fork Teanaway (28%), North Cle Elum Ridge (6%), South Cle Elum Ridge (1%) (Shriner, R., 2017). The Kittitas County 2006 *International Wildland-Urban Interface Code* (International Code Council, 2006) requires property owners of new construction to meet building

construction and defensible space requirements. Kittitas County does not have the authority to mandate these requirements for owners of properties that were constructed before 2006, which most of the homes are in the target communities.

The Kittitas County Conservation District is working together with WDNR, USFS, and local fire districts to educate landowners about wildfires through Firewise and other programs (Kittitas County Conservation District, 2017). Since 2013, 14 local communities throughout Cle Elum have become Firewise communities (NFPA, 2016).

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 would reduce overall wildfire risk and benefit public safety.

## **SECTION FIVE: AGENCY COORDINATION AND PUBLIC INVOLVEMENT**

During project development, Kittitas County coordinated with surrounding jurisdictions, local agencies (to include the Kittitas County Fire Chief’s Association, Fire Districts, KCCD, and WDNR), and landowners in the project area. The KCCD has worked with landowners in the proposed project areas to engage them in this Proposed Action. During preparation of this EA, the SHPO, the Confederated Tribes and Bands of the Yakama Nation and the Confederated Tribes of the Colville Reservation were also consulted for comment (see Appendices G and H). Consultation with the USFWS was completed for the Biological Assessment (see Appendix F).

A public notice was required for the Draft EA and is included as Appendix D. The public, Tribes, and agencies had the opportunity to comment on the EA for 30 days after publication of the notice on May 20, 2017. The notice identified the action, the proposed target communities, how to access the Draft EA, and how to submit comments. Substantive comments were provided by the WDFW and WDOE (See Appendix D) and were addressed in the EA.

The *Kittitas County Hazard Mitigation Plan* (Kittitas County, 2012) and the *Kittitas County Wildfire Protection Plan* (Kittitas County, 2009) are relevant to public involvement efforts supporting this EA.

### **5.1 Kittitas County Hazard Mitigation Plan**

The *Kittitas County Hazard Mitigation Plan* (Kittitas County, 2012) was completed in 2012. The plan identifies hazard mitigation goals, objectives, and proposed projects that would reduce or prevent injury or damage from hazards. The lead agency developing the plan was Kittitas County and participating partners included Kittitas County Conservation District, cities, fire districts, school districts, utility districts, water districts, other local agencies, and the public.

The primary natural hazards identified in the plan were avalanche, dam failure, drought, earthquake, flood, landslide, severe weather, volcano, and wildfire. The likelihood of a major wildfire in the County in the next 25 years is rated as high; the Proposed Action is within wildland hazard extreme and high risk areas (Kittitas County, 2012).

### **5.2 Kittitas County Wildfire Protection Plan**

The *Kittitas County Wildfire Protection Plan* was completed in 2009 by the Kittitas County Fire Protection Committee in cooperation with Federal, State, and local staff and public input. The vision of the plan is to “develop and implement a countywide fire protection plan that provides for sustainable development, resident and responder safety, and the protection of both natural and man-made resources of Kittitas County.” Goals of the plan include reducing the amount of burned land and losses in the WUI, public education, targeted fuel reduction projects, and alternative treatment methods such as modifying tree stand density (Kittitas County, 2009).



## SECTION SIX: PERMITTING, PROJECT CONDITIONS, and MITIGATION MEASURES

No permits would be required for the Proposed Action. Activities in the project area would comply with the project's scope of work methodology described in Section 3, Alternatives. Kittitas County would comply with the following project conditions and mitigation measures:

- To minimize potential impacts to surface waters, no vegetation management activities would be allowed within 50 feet of a stream's OHWM for non-fish bearing streams and 75 feet for fish-bearing streams.
- Fuels reduction activities in wetlands in the target communities would be avoided. If wetlands cannot be avoided, additional analysis of proposed activities and the wetland(s) on the project site would be required to minimize impacts.
- Removal of trees 8 inches dbh or greater would be prohibited within 100 feet of the OHWM of water bodies with known presence of ESA-listed fish species or as otherwise specified during ESA consultation, including: Yakima River and tributaries (including Tillman and Crystal Creeks), West Fork Teanaway River, Middle Fork Teanaway River (including Lick Creek), North Fork Teanaway River (and creek tributaries), and Teanaway River and tributaries of the river (including Mason Creek).
- To avoid potential noise-related disturbance to Northern spotted owls, project activities would be prohibited between March 1 and July 31 within suitable nesting/roosting habitat for Northern spotted owls as delineated in the Biological Assessment (Appendix E), Figures E-2 through E-5.
- Vegetation clearing of the project areas, including the removal of vegetation, during the migratory bird nesting period between March and August, has the potential to impact active migratory bird nests. If the nesting season can not be avoided, the proposed project is still subject to the prohibitions of the Migratory Bird Treaty Act and the County is responsible for obtaining and complying with any necessary permits from USFWS. The USFWS allows empty or abandoned nests to be removed and destroyed without a permit as long as they are not taken into possession. See: <http://www.fws.gov/migratorybirds/mbpermits/PoliciesHandbooks/MBPM-2.nest.PDF>
- To reduce adverse effects on wildlife habitat, best management practices outlined in the Woodland Fish and Wildlife Group's *Wildlife-Friendly Fuels Reduction in Dry Forests of the Pacific Northwest* (Strong, Bevis, & Bracher, 2016) will be incorporated into treatment prescriptions beyond the immediate structure defensible space and for larger parcels. WDFW may also be consulted as needed in individual treatment plans.
- To minimize the potential for impacts to known archeological resources within the target communities, the County would be required to determine if a participating property has or is close to a known cultural site. Site locations would be provided separately and characterized as avoidance areas. Details of cultural sites must remain confidential. Fuels reduction activities must be avoided within the perimeter of the recorded site location plus

a 250 feet buffer. This information must be documented on the project site assessment/treatment plan.

- Kittitas 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. To the maximum extent practicable, vegetation removal activities beyond the immediate defensible space around a structure that involves use of mechanized equipment should be conducted in dry soil conditions and equipment staged on existing roads or previously disturbed areas.
- Kittitas County is responsible for securing all applicable local, State, and Federal permitting before site work and complying with conditions therein.
- In the event that cultural resources or including human remains are discovered during project activities, and in compliance with State and Federal laws protecting cultural resources and human remains, including Section 106 of the NHPA, work in the immediate vicinity would cease, the area would be secured, and the SHPO and FEMA would be notified in order to evaluate the discovery.
- Any change to the approved scope of work would require re-evaluation for compliance with NEPA and other laws and EOs before implementation.

## **SECTION SEVEN: CONCLUSION**

The EA evaluated environmental and historic resources that could be affected by the Proposed Action. The evaluation did 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 and 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, associated with permits or approvals, is expected to avoid or minimize adverse effects associated with the action.

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## SECTION NINE: REFERENCES

- Anastasio, A. (1985). *The Southern Plateau: An Ecological Analysis of Intergroup Relations*. Moscow, Idaho: University of Idaho, Alfred W. Bowers Laboratory of Anthropology, Northwest Anthropological Research Notes.
- Becker, P. (2005a). *Ellensburg-Thumbnail History*. Retrieved February 3, 2017, from <http://www.historylink.org/File/7554>
- Becker, P. (2005b). *Kittitas County-Thumbnail History*. Retrieved February 3, 2017, from <http://www.historylink.org/File/7484>
- Becker, S., Roussin, T., Jones, W., Krausz, E., Walker, S., Simek, S., . . . Aoude, A. (2016, January 1). Washington Gray Wolf Conservation and Management 2015 Annual Report. Helena, MT, USA: USFWS. Retrieved January 31, 2017, from <http://wdfw.wa.gov/publications/01793/wdfw01793.pdf>
- Bell, G. (2017, February 2). WDFW GIS Specialist - Wildlife. *Phone interview*. (P. Middleton, Interviewer)
- Burke Museum. (2013, October 29). *Mammals of Washington*. Retrieved January 25, 2017, from <http://www.burkemuseum.org/research-and-collections/mammalogy/collections/mamwash/>
- Davis, R. J., Dugger, K. M., Mohoric, S., Evers, L., & Aney, W. C. (2011, January 1). Northwest Forest Plan, the First 15 Years (1994-2008): Status and Trence of Northern Spotted Owl Populations and Habitats. (U. P. Station, Ed.) Portland, OR, USA. Retrieved January 29, 2017, from [https://www.fs.fed.us/pnw/pubs/pnw\\_gtr850.pdf](https://www.fs.fed.us/pnw/pubs/pnw_gtr850.pdf)
- de Forest Miller, F. (1997). *Cultural Resource Surveys of Plum Creek Timber Company, L.P.'s Proposed Timber Harvests*. WISAARD report number 1341963.
- de Forest Miller, F. (1998). *Cultural Resource Surveys of Plum Creek Timber Company, L.P.'s Proposed Timber Harvests*. WISAARD report number 1341963.
- Desmond, G. (1952). Gambling among the Yakima. (T. C. America, Ed.) *Anthropological Series*, 14.
- ESRI. (2017). *Prime Farmland Classification*. Retrieved February 2017, from <http://soils.esri.com/ArcGIS/rest/services/soils/PrimeAgOverlay/MapServer>
- Goetz, F. A., Jeanes, E., Beamer, E., & (Eds). (2004, June 1). Bull Trout in the Nearshore. Seattle, WA.
- International Code Council. (2006). *2006 International Wildland-Urban Interface Code*. Retrieved January 11, 2017, from <https://law.resource.org/pub/us/code/ibr/icc.iwuic.2006.pdf>

- Kittitas County. (2009). *Kittitas County Wildfire Protection Plan*. Retrieved January 11, 2017, from Kittitas County Fire Protection Committee:  
<https://www.co.kittitas.wa.us/firemarshal/20090218-KCWFPP.pdf>
- Kittitas County. (2012). *Kittitas County Hazard Mitigation Plan*. Retrieved January 11, 2017, from <http://co.kittitas.wa.us/public-works/hazard-mitigation-plan/default.aspx>
- Kittitas County Audubon Society. (2017, January). *Kittitas List*. Retrieved January 25, 2017, from Kittitas County Audubon Society: [http://www.wabirder.com/docs/Kittitas\\_list.pdf](http://www.wabirder.com/docs/Kittitas_list.pdf)
- Kittitas County Board of Commissioners Office. (2017). *Kittitas County Code (Title 17A - Critical Areas)*. Retrieved January 27, 2017, from  
<https://www.co.kittitas.wa.us/boc/countycode/title17a.aspx>
- Kittitas County Conservation District. (2017). *Firewise and FACS*. Retrieved January 26, 2017, from <http://www.kccd.net/firewise.htm>
- Kittitas County Department of Public Works. (2012). *Flood Control Zone District -- Frequently Asked Questions*. Retrieved January 24, 2017, from <https://www.co.kittitas.wa.us/public-works/flood/documents/20120912-FAQ's-FCZD.pdf>
- KRD. (2017a). *Operational District Number 5*. Retrieved January 23, 2017, from  
[http://www.krdistrict.org/atlas/output\\_5.pdf](http://www.krdistrict.org/atlas/output_5.pdf)
- KRD. (2017b). *Kittitas Reclamation District (Home Page)*. Retrieved January 23, 2017, from  
<http://www.krdistrict.org/>
- LandScope. (2017a, February 7). *LandScope Washington, Columbia Plateau Vegetation*. Retrieved February 7, 2017, from  
[http://www.landscape.org/washington/natural\\_geography/ecoregions/columbia\\_plateau/vegetation/](http://www.landscape.org/washington/natural_geography/ecoregions/columbia_plateau/vegetation/)
- LandScope. (2017b, February 7). *LandScope Washington: North Cascades Vegetation*. Retrieved February 7, 2017, from  
[http://www.landscape.org/washington/natural\\_geography/ecoregions/north\\_cascades/vegetation/](http://www.landscape.org/washington/natural_geography/ecoregions/north_cascades/vegetation/)
- LandScope. (2017c, February 7). *LandScope Washington: East Cascades Vegetation*. Retrieved February 7, 2017, from  
[http://www.landscape.org/washington/natural\\_geography/ecoregions/east\\_cascades/vegetation/](http://www.landscape.org/washington/natural_geography/ecoregions/east_cascades/vegetation/)
- Miller, J. (1998). Middle Columbia River Salishans. In W. C. Sturtevant (Ed.), *Palteau, Volume XII, Handbook of North American Indians*. Washington, D.C.: Smithsonian Institution.
- National Weather Service. (2009). *Glossary (Letter r)*. Retrieved March 1, 2017, from  
<http://w1.weather.gov/glossary/index.php?letter=r>

- NatureServe. (2015, October 1). *NatureServe Explorer: An online encyclopedia of life [web application]*. Version 7.1, 7.1. Retrieved January 30, 2017, from NatureServe: <http://explorer.natureserve.org>
- NFPA. (2009). *Introduction to Firewise Principles*. Retrieved January 11, 2017, from <http://www.firewise.org/~media/firewise/files/pdfs/presentations/firewiseprinciplespresentationguide.pdf>
- NFPA. (2016). *Firewise Communities List*. Retrieved January 26, 2017, from <http://www.firewise.org/usa-recognition-program/firewise-communities-list.aspx?sso=0>
- NMFS. (2009, November 30). Middle Columbia River Steelhead Distinct Population Segment ESA Recovery Plan. Portland, OR, USA. Retrieved February 2, 2017, from [http://www.westcoast.fisheries.noaa.gov/publications/recovery\\_planning/salmon\\_steelhead/domains/interior\\_columbia/middle\\_columbia/mid-c-plan.pdf](http://www.westcoast.fisheries.noaa.gov/publications/recovery_planning/salmon_steelhead/domains/interior_columbia/middle_columbia/mid-c-plan.pdf)
- NOAA Fisheries. (2011, July 26). 5-Year Review: Middle Columbia River Steelhead. Portland, Oregon, USA. Retrieved February 2, 2017, from [http://www.nmfs.noaa.gov/pr/pdfs/species/middlecolumbiariver\\_steelhead\\_5yearreview.pdf](http://www.nmfs.noaa.gov/pr/pdfs/species/middlecolumbiariver_steelhead_5yearreview.pdf)
- NOAA Fisheries. (2017). *Recovery Glossary*. Retrieved March 1, 2017, from [http://www.westcoast.fisheries.noaa.gov/protected\\_species/salmon\\_steelhead/recovery\\_planning\\_and\\_implementation/recovery\\_glossary.html](http://www.westcoast.fisheries.noaa.gov/protected_species/salmon_steelhead/recovery_planning_and_implementation/recovery_glossary.html)
- NRCS. (Undated). *Climate Narrative for Wenatchee National Forest, Naches Region, Soil Survey Area, Washington*. Retrieved January 20, 2017, from [https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=0ahUKEwiCwKmiw9HRAhWCOCYKHa0BDsUQFggaMAA&url=http%3A%2F%2Fwww.wcc.nrcs.usda.gov%2Flegacy%2Fftp%2Fsupport%2Fclimate%2Fsoil-nar%2Fwa%2Fwenatchee\\_naches.doc&usq=AFQjCNF-Rz4mc0](https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=0ahUKEwiCwKmiw9HRAhWCOCYKHa0BDsUQFggaMAA&url=http%3A%2F%2Fwww.wcc.nrcs.usda.gov%2Flegacy%2Fftp%2Fsupport%2Fclimate%2Fsoil-nar%2Fwa%2Fwenatchee_naches.doc&usq=AFQjCNF-Rz4mc0)
- NWCC. (2017). *Northwest Interagency Coordination Center, Northwest Large Fire Interactive Map*. Retrieved January 2017, from <https://gacc.nifc.gov/nwcc/>
- Ochran, J. (2014). *Kittitas County: About the County*. Retrieved February 3, 2017, from <https://www.co.kittitas.wa.us/about/history.aspx>
- Representative Tom Dent. (2015). *Wildfire in Washington*. Retrieved February 16, 2017, from <http://houserepublicans.wa.gov/files/uploads/Dent-wildfire-report.pdf>
- Ross, A. (1855). *The Fur Hunters of the Far West: A Narrative of Adventures in the Oregon and Rocky Mountains*. London: Smith, Elder.
- Schuster, H. (1998). Yakima and Neighboring Groups. In W. C. Sturtevant (Ed.), *Handbook of North American Indians, Plateau, Volume XII*. Washington D.C.: Smithsonian Institution.

- Shriner, R. (2017, April 10 and June 21). Email correspondence with Science Kilner (FEMA) regarding Cumulative Effects and Treatment Prescriptions. Kittitas County Conservation District.
- Strong, N., Bevis, K., & Bracher, G. (2016, September 30). *Wildlife-Friendly Fuels Reduction in Dry Forests of the Pacific Northwest*. Retrieved July 7, 2017, from Woodland Fish and Wildlife: <http://woodlandfishandwildlife.com/wp-content/uploads/2016/09/WildlifeAndFuelsPNW2016Final.pdf>
- Suncadia Resort. (2017). *History, A Land of Many Stories*. Retrieved from <https://www.destinationhotels.com/suncadia-resort/washington-state-resorts/history>
- The Climate Impacts Group. (2009). *The Washington Climate Change Impacts Assessment*. Retrieved January 20, 2017, from <http://www.cses.washington.edu/db/pdf/wacciaexecsummary638.pdf>
- U.S. Census Bureau. (2015). *American Community Survey 5-Year Estimates*. Retrieved from <https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml>
- USDA. (2015). *Soils Information, Prime and Statewide Important Farmland*. Retrieved March 1, 2017, from [https://efotg.sc.egov.usda.gov/references/public/CO/5a\\_Prime\\_Farmland\\_Definition.pdf](https://efotg.sc.egov.usda.gov/references/public/CO/5a_Prime_Farmland_Definition.pdf)
- USDA. (2017). *Web Soil Survey*. Retrieved January 11, 2017, from <https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx>
- USDA Caribbean Area. (2017). *Prime & Other Important Farmlands Definitions*. Retrieved March 1, 2017, from [https://www.nrcs.usda.gov/wps/portal/nrcs/detail/pr/soils/?cid=nrcs141p2\\_037285](https://www.nrcs.usda.gov/wps/portal/nrcs/detail/pr/soils/?cid=nrcs141p2_037285)
- USEPA. (2001). *Wildfire Smoke -- A Guide for Public Health Officials*. Retrieved March 1, 2017, from <https://www3.epa.gov/ttnamti1/files/ambient/smoke/wildgd.pdf>
- USEPA. (2016a). *NAAQS Table*. Retrieved January 20, 2017, from <https://www.epa.gov/criteria-air-pollutants/naaqs-table>
- USEPA. (2016b). *Climate Change Indicators: Wildfires*. Retrieved March 1, 2017, from <https://www.epa.gov/climate-indicators/climate-change-indicators-wildfires>
- USEPA. (2017, February 7). Ecoregion Data.
- USFS. (2017). *About the Forest*. Retrieved from USDA Forest Service, Okanogan-Wenatchee National Forest: <https://www.fs.usda.gov/main/okawen/about-forest>
- USFWS. (2010, January 1). Additional Information on Bull Trout and the Proposed Critical Habitat Revision, January 2010. Boise, ID, USA. Retrieved January 29, 2017, from [https://www.fws.gov/oregonfwo/species/data/bulltrout/Documents/finalQA\\_01.13.10.pdf](https://www.fws.gov/oregonfwo/species/data/bulltrout/Documents/finalQA_01.13.10.pdf)



- USFWS. (2013, December 2). *List of Migratory Bird Species Protected by the Migratory Bird Act as of December 2, 2013*. Retrieved January 25, 2017, from USFWS: Migratory Bird Program: <https://www.fws.gov/migratorybirds/pdf/policies-and-regulations/ListofMBTAProtectedSpecies1312.pdf>
- USFWS. (2015a, September 1). Mid-Cloumbia Recovery Unit Implementation Plan for Bull Trout (*Salvelinus confluentus*). Portland. Retrieved January 30, 2017, from [http://ecos.fws.gov/docs/recovery\\_plan/Final\\_Mid\\_Columbia\\_RUIP\\_092915.pdf](http://ecos.fws.gov/docs/recovery_plan/Final_Mid_Columbia_RUIP_092915.pdf)
- USFWS. (2015b, September 25). *Migratory Bird Program: Birds of Conservation Concern*. Retrieved February 13, 2017, from <https://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php>
- USFWS. (2017a). *National Wetlands Inventory*. Retrieved January 23, 2017, from <https://www.fws.gov/wetlands/data/mapper.HTML>
- USFWS. (2017b, January 30). USFWS Consultation Letters. *USFWS Consultation Letter-Species Lists*. Lacey, WA, USA: USFWS. Retrieved January 30, 2017
- USFWS. (2017c, January 30). *Washington Fish and Wildlife Office: Northern Spotted Owl*. Retrieved January 30, 2017, from <https://www.fws.gov/wafwo/articles.cfm?id=149489593>
- USFWS. (2017d, January 30). Species Fact Sheet: Bull Trout, *Salvelinus confluentus*. Retrieved January 30, 2017, from <https://www.fws.gov/wafwo/species/Fact%20sheets/BT%20final.pdf>
- USFWS. (2017e, January 24). USFWS. Retrieved January 24, 2017, from IPaC: Information for Planning and Conservation: <https://ecos.fws.gov/ipac/location/index>
- USGS. (2017, February 15). *National Gap Analysis Program (GAP) Land Cover Data Viewer*. Retrieved February 15, 2017, from [https://gis1.usgs.gov/csas/gap/viewer/land\\_cover/Map.aspx](https://gis1.usgs.gov/csas/gap/viewer/land_cover/Map.aspx)
- Washington State Department of Health. (2017). *Smoke from Fires*. Retrieved January 20, 2017, from <http://www.doh.wa.gov/CommunityandEnvironment/AirQuality/SmokeFromFires/WildfireSmoke>
- Washington State Horse Park. (2017). *Washington State Horse Park*. Retrieved from <http://www.wahorsepark.org/>
- Washington State Legislature. (2011). *Shoreline Management Act -- Streams and Rivers Constituting Shorelines of the State*. Retrieved January 23, 2017, from <http://apps.leg.wa.gov/wac/default.aspx?cite=173-18-230>
- WDE. (2005). *Upper Yakima Basin Temperature Total Maximum Daily Load Study*. Retrieved 23 2017, January, from <https://fortress.wa.gov/ecy/publications/publications/0503111.pdf>

- WDE. (2013). *Washington Air Quality Advisory for Smoke and Other Fine Particle Air Pollution*. Retrieved January 18, 2017, from [https://fortress.wa.gov/ecy/enviwa/App\\_AQI/AQI.en-US.pdf](https://fortress.wa.gov/ecy/enviwa/App_AQI/AQI.en-US.pdf)
- WDE. (2015). *Water Resource Inventory Area 39 -- Upper Yakima*. Retrieved January 23, 2017, from Washington Department of Ecology: <http://www.ecy.wa.gov/water/wria/39.html>
- WDE. (2017a). *Air Quality Monitoring Sites*. Retrieved January 18, 2017, from <https://fortress.wa.gov/ecy/enviwa/>
- WDE. (2017b). *Washington State Water Quality Atlas*. Retrieved January 23, 2017, from <https://fortress.wa.gov/ecy/waterqualityatlas/map.aspx?CustomMap=y&RT=0&Layers=23,29&Filters=n,n,n,n>
- WDE. (2017c). *Water Quality Improvement Projects (TMDLs) -- WRIA 39: Upper Yakima*. Retrieved January 23, 2017, from <http://www.ecy.wa.gov/programs/wq/tmdl/TMDLsbyWria/tmdl-wria39.html>
- WDE. (2017d). *Shorelines of statewide significance*. Retrieved March 1, 2017, from [http://www.ecy.wa.gov/programs/sea/sma/st\\_guide/jurisdiction/SSWS.html](http://www.ecy.wa.gov/programs/sea/sma/st_guide/jurisdiction/SSWS.html)
- WDFW. (2005a). *Living with Wildlife: Northern Flickers*. Retrieved January 25, 2017, from Species Fact Sheets: Birds: <http://wdfw.wa.gov/living/northernflickers.pdf>
- WDFW. (2005b). *Living with Wildlife: American Robin*. Retrieved January 25, 2017, from Living with Wildlife: <http://wdfw.wa.gov/living/robins.pdf>
- WDFW. (2005c). *Living with Wildlife: Snakes*. Retrieved January 25, 2017, from Living with Wildlife: <http://wdfw.wa.gov/living/snakes.pdf>
- WDFW. (2008, August 1). *Priority Habitat and Species List, Updated 2016*. Olympia. Retrieved January 30, 2017, from <http://wdfw.wa.gov/publications/00165/wdfw00165.pdf>
- WDFW. (2015). *Washington's State Wildlife Action Plan: 2015 Update*. Olympia: Washington Department of Fish and Wildlife.
- WDFW. (2016a, July 1). *Washington Sport Fishing Rules*. Retrieved January 25, 2017, from <http://wdfw.wa.gov/publications/01818/wdfw01818.pdf>
- WDFW. (2016b, May 1). *State Listed Species, Revised May 2016*. Olympia. Retrieved February 2, 2017, from [http://wdfw.wa.gov/conservation/endangered/state\\_listed\\_species.pdf](http://wdfw.wa.gov/conservation/endangered/state_listed_species.pdf)
- WDFW. (2017a, January 25). *Recreational Salmon Fishing: Salmon/Steelhead Species Information*. Retrieved January 25, 2017, from <http://wdfw.wa.gov/fishing/salmon/species.html>
- WDFW. (2017b, January 25). *Species Fact Sheets: Mammals*. Retrieved January 25, 2017, from <http://wdfw.wa.gov/living/mammals.html>

- WDFW. (2017c). *Conservation: Species and Ecosystem Science: Waterfowl Ecology*. Retrieved January 25, 2017, from <http://wdfw.wa.gov/conservation/research/projects/waterfowl/>
- WDFW. (2017d, January 30). *Fish Washington Species Info: Bull Trout*. Retrieved January 30, 2017, from <http://wdfw.wa.gov/fishing/washington/Species/1259/>
- WDFW. (2017e, February 2). *Fishing and Shellfishing: Salmon and Steelhead Species Information: Steelhead (Rainbow Trout)*. Retrieved February 2, 2017, from <http://wdfw.wa.gov/fishing/salmon/steelhead.html>
- WDFW. (2017f, January 31). *Gray Wolf Conservation and Management: Wolf Packs in Washington: Teanaway*. Retrieved January 31, 2017, from [http://wdfw.wa.gov/conservation/gray\\_wolf/packs/14/](http://wdfw.wa.gov/conservation/gray_wolf/packs/14/)
- WDFW. (2017g). *L.T. Murray Unit*. Retrieved February 22, 2017, from WDFW Lands, L.T. Murray Wildlife Area: [http://wdfw.wa.gov/lands/wildlife\\_areas/lt\\_murray/L.T.%20Murray/](http://wdfw.wa.gov/lands/wildlife_areas/lt_murray/L.T.%20Murray/)
- WDFW Fish Program. (2000, September 1). *Bull Trout and Dolly Varden Management Plan*. Olympia, WA, USA. Retrieved January 30, 2017, from <http://wdfw.wa.gov/publications/00930/wdfw00930.pdf>
- WDNR. (2017a). *Fire Prevention & Fuel Mapping System*. Retrieved January 30, 2017, from <https://fortress.wa.gov/dnr/protectiongis/fmanfire/default.aspx>
- WDNR. (2017b). *Conserving the Teanaway*. Retrieved from Washington State Department of Natural Resources, Forest and Trust Lands: <http://www.dnr.wa.gov/Teanaway>
- WEMD. (2014, August 21). *Hazard Mitigation Grant Program, Application DR #4188, Kittitas County Wildfire Fuels Reduction Program*.
- Wiles, G. J., Allen, H. L., & Hayes, G. E. (2011, December 3). *Wolf conservation and management plan for Washington*. Olympia, WA, USA: Washington Department of Fish and Wildlife. Retrieved January 31, 2017, from <http://wdfw.wa.gov/publications/00001/wdfw00001.pdf>