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**DRAFT
Forest Management Plan**

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2009

For

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**Camp Murray
Pierce County, Washington**



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WASHINGTON ARMY NATIONAL GUARD

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February 18, 2009

EXECUTIVE SUMMARY

Camp Murray contains more than 120 acres of forest, including mixed coniferous/deciduous forest, Oregon white oak woodlands, and trees throughout the built environment that comprise the urban forest. Forest resources on Camp Murray are limited to small forested stands and individual or small groups of trees within the built environment.

There are no forest stands with commercial potential on Camp Murray. Most forested areas on Camp Murray are considered as sensitive habitat, and therefore, managed for the purposes of biological conservation and compliance with applicable federal, state, and local laws. Oregon white oak woodlands are classified as a Washington State Priority Habitat (WDFW 2007). Activities within this forest type are regulated by Pierce County. Activity in much of Camp Murray forests is also restricted in wetland, shoreline, and riparian areas and their buffers, and in the vicinity of previously identified eagle nest sites.

This Forest Management Plan (FMP) provides management recommendations for forests in Camp Murray to ensure 1) installation compliance with all applicable laws; 2) the sustainability of natural resources needed to sustain the military mission; and 3) the safety of life and property. This FMP has been written specifically for the management of forest resources on Camp Murray. In addition to addressing Oregon oak woodlands (OW), the FMP also addresses the most common forest types in western Washington: mixed coniferous/deciduous forest (MF) and urban forest (UF). Thus, the FMP can be used to guide management activities in similar forest types found on other Washington Army National Guard (WAARNG) facilities in western Washington.

This FMP has been developed as a component of the Integrated Natural Resources Management Plan (INRMP), and, therefore, is subject to the same five-year implementation period. Projects related to forest management are discussed in Chapter 7 and Table 6 of the INRMP, and include:

- **Project 3.1.1:** Update and Implement the Camp Murray IPMP
- **Project 3.1.2:** Invasive Plant Species Control
- **Project 3.3.1:** Woodland Preservation and Restoration
- **Project 3.3.2:** Maintenance and Protection of Restored Areas
- **Project 3.5.1:** Forest Plant Community and Wildlife Habitat Features Inventory and FMP Update
- **Project 3.5.2:** Maintenance of existing forest trees and restoring degraded forest areas
- **Project 4.1.1:** Installation of Interpretive Signs

TABLE OF CONTENTS

1.	INTRODUCTION	1
1.1	Camp Murray Forest Management	1
1.2	Development of the Forest Management Plan	2
1.3	Applicable Laws and Regulations	2
2.	GENERAL PRINCIPLES OF FOREST MANAGEMENT	4
2.1	Structural Complexity	4
2.2	Edges and Edge Effect	4
2.3	Pests and Diseases	5
2.4	Urban Forests	7
2.5	Hazard Trees	7
3.	EXISTING FOREST CONDITIONS	8
3.1	Oregon Oak Woodlands	8
3.2	Mixed Coniferous/deciduous Forest	9
3.3	Urban Forest	10
4.	MANAGEMENT RECOMMENDATIONS	11
4.1	Facility-wide Guidelines	11
4.2	Mixed Coniferous/deciduous Forest (MF)	12
4.3	Oak Woodlands (OW)	13
4.4	Urban Forest (UF)	13
5.	PROPOSED PROJECTS	14
6.	CONCLUSION.....	14
7.	REFERENCES	15

1. Introduction

Forest habitat encompasses more than 120 acres of Camp Murray (see INRMP Figure 5). The most prevalent forest habitat type is the mixed coniferous/deciduous forest (73 acres), which is located primarily in the western portion of the property. Other forest habitat types include: Oregon white oak woodlands (48 acres), which are located primarily in the northern portion of the property; and urban forest, which is located throughout the built environment of Camp Murray.

The purpose of this Forest Management Plan (FMP) is to provide management recommendations for forests on Camp Murray to ensure (1) installation compliance with all applicable laws; (2) sustainability of natural resources needed to sustain the military mission; and (3) safety of life and property. There are no stands with commercial potential on Camp Murray. This FMP is a component of the Integrated Natural Resources Management Plan (INRMP), and therefore, is subject to the same five-year planning and implementation period.

1.1 Camp Murray Forest Management

Forest resources are limited on Camp Murray to small forest stands and to individual or groups of trees within the built environment. This is in contrast to forests on the adjacent Ft. Lewis installation, where a large tract of coniferous forest provides merchantable timber. Because most forested areas on Camp Murray are considered sensitive habitat, forests are managed primarily for the purposes of biological conservation and compliance with applicable federal, state, and local laws.

Oregon white oak woodlands, a Priority Habitat as defined by the Washington Department of Fish Wildlife (WDFW), comprises a large percentage of forests on Camp Murray. Oregon white oak woodlands are a rare habitat in western Washington, and have been targeted for regional conservation. Oregon white oak trees are considered as a keystone species which support a community that contains rare and unique endemic plant and animal species, some of which are for future listing, or already classified as Priority Species in Washington State. Listed species that could potentially use Oregon oak woodlands on Camp Murray include western gray squirrels, and white-breasted nuthatches. While no listed species are known to use Camp Murray's Oregon white oak woodlands, the stands are required to be managed for the potential presence of these species, and activities within Oregon white oak woodlands are restricted by state and local regulations. Listed species known to use other forests on Camp Murray include pileated woodpeckers and bald eagles, both of which use the older, mixed-conifer forests in the western portion of the installation.

Activities within parts of the Camp Murray forest are also restricted in the vicinity of historic bald eagle nests, wetlands, American Lake, and Murray Creek. Activity in forests especially in the vicinity of bald eagle nest sites is primarily restricted during the wintering and breeding season, from December to August (see INRMP Section 6.4.1). Activity within the vicinity of wetlands, Murray Creek, and the American Lake shoreline is restricted year-round within specified buffer widths (see INRMP Section 6.5.4) Restricted forested areas on Camp Murray are shown in Figure 8.

This management plan has been written specifically for the management of forest resources on Camp Murray. In addition to addressing Oregon oak woodlands (OW), the FMP also

addresses the most common forest types in western Washington: mixed coniferous/deciduous forest (MF) and urban forest (UF). Thus, the FMP can be used to guide management activities in similar forest types found on other WAARNG facilities located in western Washington.

1.2 Development of the Forest Management Plan

A Tree and Forest Management Plan (TFMP) for Camp Murray was prepared by Jones and Stokes, Inc. in 2005. However, the plan was deemed inadequate for managing forest resources on Camp Murray, and was, therefore, not adopted for implementation by the WAARNG.

This FMP has been developed concurrently with the preparation of the INRMP. The plan was developed in cooperation with WAARNG staff, using information and recommendations contained in previous forest studies on Camp Murray (Jones and Stokes 2005; Turnstone Environmental Consultants, Inc. 2006); and recommendations from public and private agencies with an interest in managing forests on Camp Murray.

A forest inventory for Camp Murray was not conducted for the preparation of this FMP, nor was a comprehensive analysis of existing forest vegetation communities, including wildlife habitat features, on Camp Murray. The WAARNG and their consultants relied on information regarding existing conditions contained in previous reports. Inconsistencies in data were encountered in the preparation of this FMP, particularly in regards to the location of Oregon oak woodlands on the installation. These inconsistencies were resolved through interpretation of 2006 aerial photos of the installation and coordination between the WAARNG and their consultants. According to descriptions provided by the WAARNG, existing conditions within Oregon oak woodlands have changed in some areas from what was described in the 2005 TFMP.

1.3 Applicable Laws and Regulations

Laws, regulations, executive orders (EOs), and military regulations, directives, and guidance pertaining to the WAARNG forest management include:

- Endangered Species Act (ESA), 7 USC §136; 16 USC §460 *et seq.* (1973) as amended;
- Sikes Act Improvement Act (SAIA) (16 USC §670a-o);
- National Environmental Policy Act (NEPA) (42 USC §4321);
- 32 CFR 651, Environmental Effects of Army Actions;
- Army Regulations (AR) 200-1, Environmental Protection and Enhancement, effective 27 December 2007;
- Audit for Army Forestry Program, AA 01-420, dated 22 Aug 2001;
- Army Guidance-Procedures for Forest Inventory, June 2006;
- Department of Defense (DoD) Directive 4700.1, Natural Resources Management Program;
- Washington State Forest Practices Rules - Title 222 Washington Administrative Code;

- Bald and Golden Eagle Protection Act of 1940 (16 USC §668-668d, 54 Stat. 250);
- The Migratory Bird Treaty Act, as amended (16 USC §703-712);
- Pierce County Critical Areas Ordinance: Fish and Wildlife Species and Habitat Conservation Areas (18E.40.020); and
- Shoreline Management Act (RCW 90.58).

These laws and regulations are described in Appendix D.

2. General Principles of Forest Management

2.1 Structural Complexity

The structural complexity of a forest refers to the distribution and diversity of understory and overstory vegetation, stand age composition, height of the canopy, canopy layering, canopy openings, and the presence of habitat features such as snags and downed logs. The structure of the forest indicates the integrity and habitat function of a forest.

Forests on Camp Murray have low to moderate structural complexity. No mature forest exists; however, several large trees with structurally complex crowns are located in the western portion of the installation. Some of these trees are used by bald eagles for perching. In addition, pileated woodpecker use snags throughout the forest as forage, and may use large trees for nesting.

A forest typically becomes more complex in structure as it matures. Early successional forests typically have a lower canopy, fewer canopy layers, and large patches of single species of plants. Over time, the trees grow taller and are more varied in height. As trees die, more sunlight reaches the forest floor, encouraging the growth of sapling trees. The dead standing trees (“snags”) become habitat to a diverse array of animal species. The canopy gaps that result also provide “edge” habitat, which stimulates the growth of vegetation in the surrounding forest. Eventually, the species composition and ground layer vegetation of forest stands become more diverse (Smith, et al. 1996).

Pruning and thinning are two of the primary tools used to maintain structural complexity in managed forests (Smith et al. 1996). Thinning refers to the selective removal of trees in a given area to reduce competition for limited resources (primarily light, water, and nutrients). Removing some trees increases the relative abundance of resources to remaining trees and understory vegetation, which then develop more vigorously, accelerating the development of more complex forest structure such as a diverse understory, a multi-layered canopy, and larger trees. Thinning treatments can be designed to favor ecological elements such as wildlife trees, gaps, and snags, and to simulate natural disturbance processes that increase forest structure such as wind and disease.

Pruning refers to the selective removal of biomass (i.e., branches, foliage) from living trees. Canopy pruning is used to create openings in the forest canopy that allow light to penetrate to the forest understory, thereby stimulating the growth of the next generation of canopy trees and increasing the diversity of understory vegetation.

Thinning, pruning, and the retention of habitat features such as snags and downed logs can be used to enhance habitat for sensitive wildlife species on Camp Murray such as bald eagles and pileated woodpeckers, and to stimulate the regeneration of Oregon oak trees in oak woodlands.

2.2 Edges and Edge Effect

Several characteristics, including microclimatic differences, and the composition of plant and wildlife communities, distinguish forest edges from forest interiors (McDonald and Urban 2005). Forest edges have higher levels of light, lower humidity, greater temperature fluctuations, and higher windspeeds. Edges are typically one of the least stable parts of the forest, and are prone to high levels of disturbance, including windthrow, and the

encroachment of non-native and/or invasive plant and animal species. Wildlife living in edge habitats typically consists of generalist species (Brown 2007), and is more prone to predation by feral cats and dogs in urbanized environments. Small forests have a comparatively higher percentage of edge habitat than do larger forests because of their large perimeter to interior ratio.

Edge habitat comprises a large proportion of the forest on Camp Murray due to the small size of forest patches.

2.3 Pests and Diseases

Forest pests and diseases play an integral role in maintaining the structure and diversity of forest vegetation. However, if left unchecked, they can have devastating effects on forests. The following pests and diseases are known to exist in Washington, and could pose a potential threat to forests on WAARNG installations (USDA 2007):

- Douglas fir tussock moth (*Orgyia pseudotsugata*)
- Douglas fir beetle (*Dendroctonus pseudotsugae*)
- Gypsy moth (*Lymatria dispar*)
- Citrus longhorned beetle (*Anoplophora chinensis*)
- Laminated root rot (*Phellinus weirii*)
- Sudden oak death (SOD) (*Phytophthora ramorum*).

These diseases can be identified in the field through characteristic symptoms as discussed below. Laminated root rot is the only disease found to occur at Camp Murray.

2.3.1 Douglas fir Tussock Moth

From a distance, trees infected with Douglas-fir tussock moths appear scorched or off-color, often with a noticeably thin crown. Tussock moth larvae prefer new foliage, especially when young, hence the defoliation occurs from the top down and from the tips of the branches inwards. The tree crown has a high percentage of new foliage and may be severely defoliated and often killed. Larvae spin webs enclosing leader and branch tips. When the population density is normal, grey cocoons may be found on the underside of old foliage. When the population density is high, additional cocoons may be found on branches, on the trunk, or on understory vegetation (WSU 2007).

2.3.2 Douglas fir Beetle

Trees weakened by other stresses are most susceptible to infestation by Douglas fir beetles. Although most serious outbreaks in Washington occur in the northeastern portion of the state, there have been pockets of Douglas fir beetle infestation throughout the state (WDNR 2008).

Boring dust from the beetle's entry may be found in bark crevices or at the base of the tree; it will be reddish or yellowish. No pitch tube is found on the trunk, but resin streamers may form from attacks on the upper trunk. The foliage of attacked trees turns yellow and then fades to reddish-brown by late summer or fall, though it may remain on the tree until the following spring (WSU 2007).

2.3.3 Laminated Root Rot

Laminated root rot is a fungus that resides in the roots and stumps of trees. The pathogen spreads between living trees via root contacts. As the fungus advances along the roots of a tree, the roots distal to the fungus are killed, denying the tree water and nutrients necessary for growth. The pathogen can live saprophytically in dead roots for 50 years or more (SWOFIDSC 2008).

Affected trees show marked reduction in height and diameter growth. The crown thins and yellows. Trees may respond to the infection by producing a heavy cone crop. Trees are commonly windthrown after the disease rots off roots just below the root collar, forming a "root ball." This disease forms "root rot centers", where the disease spreads to adjacent trees from an initial infected tree. In the center of a tree, an old stump or an empty area is formed, or in an old center, regeneration. Trees within several yards to hundreds of feet (depending on the size and age of the infection) will be dead or dying, and trees further out will show early crown symptoms. Trees within 50 feet of the apparent edge of a disease center are very probably infected, but will not show crown symptoms until 50 to 75 percent of the roots are infected. "Root rot centers" may be many acres in size, and spread out at the rate of about one to two feet per year (WSU 2007).

2.3.4 Gypsy Moth

The gypsy moth devours foliage of trees and shrubs, favoring oak, birch, apple, poplar, alder, cottonwood, hawthorn, and willow. The Asian variety also favors evergreens. Trees become rapidly defoliated, and either die or become so weak that they are susceptible to disease and other pests. Despite many introductions of gypsy moth into Washington State since the 1970s, the Washington State Department of Agriculture (WSDA) has successfully kept the pest from becoming established in the state (WSDA 2007). The most recent introduction into our region was in 2005, when several moths were trapped in Seattle and Bellevue (WDNR 2008).

2.3.5 Citrus Long-horned Beetle

The citrus long-horned beetle is a non-native insect that attacks more than 40 varieties of hardwood and fruit trees. In western Washington, the citrus long-horned beetle has no natural enemies, and threatens greenbelts, urban landscapes, backyard trees, orchards, and forests. These large beetles are shiny and black with irregular white splotches on its back and long black and white banded antennae that are longer than the body.

Newly hatched grubs chew their way into the interior of trees, creating internal tunnels, and eventually, girdling the tree. When grubs mature into adult beetles, they chew their way out of tree, leaving noticeable holes in the tree bark (WSDA 2007). The last known introduction in Washington occurred in Tukwila in 2001 (WNDR 2008).

2.3.6 Sudden Oak Death

Sudden oak death (SOD) is a plant disease common in Europe, but newly arrived to western Washington, that attacks many types of plants and trees common to the Pacific Northwest, including azaleas, big leaf maples, huckleberry, California bay laurel, camellia, myrtles, honeysuckle, Pacific madrone, Douglas fir, rhododendrons, and viburnum. Symptoms vary from plant to plant, and may include leaf spots, needle and tip blight, shoot-tip dieback, and canker formations. The worse infections cause girdling and death. The only way to confirm the presence of SOD is through laboratory testing (WSDA 2007).

Western Washington is considered to be at high risk for SOD because of the number of host species present in our forests. However, extensive tests through 2005 indicate that the disease has been contained to nursery stock (WDNR 2008).

2.3.7 Invasive plant species

Most invasive species are adapted to thrive in highly disturbed environments. Therefore, forest edges, gaps, and young forests with developing tree canopies are particularly susceptible to colonization by invasive plant species (Hengeveld 1989). Once established, invasive plant species inhibit the growth of native vegetation by smothering existing plants and inhibiting the establishment of new individuals, thereby altering the normal trajectory of forest development. Some invasive species are present in forests at Camp Murray, including purple loosestrife, reed canarygrass, yellow-flag iris, and Scotch broom.

2.4 Urban Forests

Trees located in the built environment constitute the urban forest. In addition to enhancing the appearance of buildings, parking lots, roads, and other facilities, trees provide environmental benefits such as shelter to buildings from sun, wind, and rain; soil stabilization and erosion control; and mitigation of harsh rainfall (McPherson, et al. 2007). Trees in the urban forest are particularly susceptible to damage by wind, disease, and anthropogenic disturbance, and are more likely to become stressed due to a number of factors, including construction-altered soils, confined root-spaces, chemicals such as deicing salts, or herbicides and fertilizers commonly used in landscape maintenance.

Although all forested areas on Camp Murray could be considered as urban forest due to their small patch size, the urban forests referenced in the FMP refers to the individual trees and stands of trees found within the developed portions of Camp Murray. Trees in the urban forest at Camp Murray are also susceptible to stress and damage to roots from personal vehicle use. Stress and damage to trees in the urban forest can lead to the development of 'hazard trees', which are discussed in the next section.

2.5 Hazard Trees

Maintaining the health of the urban forest can prevent disruptions to the military mission by reducing the risk of trees from falling into fences, roads, parking lots, utilities, and people. When trees are damaged to the point of posing a threat to buildings, walkways, parking lots, or other areas used by people, they are considered to be 'hazard trees'. Hazardous tree defects include decayed wood; cracks; root problems; weak branch unions; cankers; poor architecture; and dead trees, tops, or branches (USDA 2003).

Several inspection methods can be useful to assess the degree of risk to persons or property by hazard trees. Individual tree inspections provide an in-depth risk assessment that considers the full range of tree defects and site conditions, and the likelihood that the tree will fall and hit a target. Other, less intensive inspection methods such as drive-by windshield inspections can be used to identify high-risk zones within the camp, and to conduct initial post-storm tree damage surveys (E²M 2007a).

3. EXISTING FOREST CONDITIONS

Three main forest types are present on Camp Murray:

- Oregon oak woodlands;
- Mixed coniferous/deciduous forest; and
- Urban forest.

Oregon oak woodlands occur primarily in the north and east of Camp Murray, and as small groups or individual oak trees within the built environment (see INRMP Figure 5). The mixed coniferous/deciduous forest is located throughout the western portion of the installation, and is dominated by Douglas fir, with Oregon ash more prevalent along the shoreline of American Lake. The urban forest is located throughout the built environment of Camp Murray, and consists of a mixture of native and ornamental trees, including Oregon oak, Pacific madrone, and big-leaf maple (Turnstone 2006).

A forest inventory for Camp Murray was not conducted for the preparation of this FMP. WAARNG and their consultants relied on information regarding existing conditions contained in previous reports.

3.1 Oregon Oak Woodlands

Camp Murray lies at the northern edge of the historic range for Oregon white oaks. Oregon oak woodlands are considered as a Priority Habitat by the WDFW. Oak woodlands are also considered a 'Habitat of Local Importance' by Pierce County, and regulated under the Pierce County Municipal Code (18E.40.020). Under the Pierce County code, Oregon white oak woodlands, stands, and individual trees meeting the following criteria shall be considered priority habitat and shall be subject to protection:

Priority Oregon White Oak Woodlands: Stands of Oregon white oak or oak/conifer associations where the stand is at least one acre in size and the canopy coverage of the oak component of the stand is greater than or equal to 25 percent.

Significant Oaks and Stands: Within the urban growth area, single oaks or stands of oaks smaller than one acre in size when any of the following criteria are met:

- (1) Individual trees having a diameter at breast height of 20 inches or more; or
- (2) Oregon white oak stands in which the oak trees have an average diameter at breast height of 15 inches or more regardless of stand size.

Four Oak Management Zones (OMZs) have been established to manage oak woodlands at Camp Murray (Jones and Stokes 2005), and to ensure that the installation complies with all applicable regulations. Oak Management Zones, and other forested areas where activity is limited are shown on Figure 8 of the INRMP.

3.1.1 Oak Management Zone 1

Oak Management Zone 1 (OMZ-1) is located in the north-central portion of Camp Murray, and is the largest stand of oaks on the installation. It is composed of healthy and mature Oregon

oak trees, many of which have multiple stems. Oaks are generally even-spaced, with little vegetation in the understory. Canopy closure ranges from 60 to 80 percent (Jones and Stokes, Inc. 2005).

Much of this stand's understory has been mowed for many years and is comprised of a mixed grass community. Little oak regeneration is occurring.

3.1.2 Oak Management Zone 2

Oak Management Zone 2 (OMZ-2) is contiguous with OMZ-1, but is distinct from this stand because it contains a well-developed understory of native plants, as well as a mix of mature Douglas fir and other tree species. This area has relatively high plant species diversity and structural diversity, making it good habitat for birds and small mammals. Snags and downed logs (mostly from Douglas fir) are present within this stand, and evidence of woodpecker use is common (Jones and Stokes, Inc. 2005).

Douglas fir trees are encroaching into OMZ-2, and shading out oak trees in some areas. In addition, invasive species, including Himalayan blackberry and Scotch broom, are encroaching into the understory (Jones and Stokes, Inc. 2005), and could inhibit the growth of native understory vegetation.

3.1.3 Oak Management Zone 3

Oak Management Zone 3 (OMZ-3) includes small groups of oak trees distributed throughout the central portion of the facility. Oak trees appear to be healthy. The understory is mowed, which has prohibited oak regeneration in the understory (Jones and Stokes, Inc. 2005).

3.1.4 Oak Management Zone 4

Oak Management Zone 4 (OMZ-4) is located on the southern edge of the facility, adjacent to Fort Lewis property. This stand contains healthy oak trees; however, the native understory has been degraded by the encroachment of Himalayan blackberry, Douglas fir, and Scotch broom. In addition, Douglas fir trees are currently shading out oak trees in some places, leading to some oak mortality (Jones and Stokes, Inc. 2005).

Laminated root rot was identified in a small stand of Douglas fir trees in this area (Jones and Stokes, Inc. 2005).

3.2 Mixed Coniferous/deciduous Forest

The mixed coniferous/deciduous forest is located throughout the western portion of the installation. In conifer-dominated areas, Douglas fir, big leaf maple, and Oregon ash are the dominant overstory species, with snowberry, beaked hazelnut, salal, and a variety of native herbaceous species dominant in the understory. Oregon ash and willow become more dominant near the shoreline of American Lake.

Himalayan blackberry is the most prevalent invasive species in this area, and grows more abundantly near the forest edge. English ivy is also present along the forest edges and in some areas of the forest interior.

Several areas within this forest type are subject to federal and state regulation. Two large Douglas fir trees located in the mixed coniferous/deciduous forest in the western portion of the property have historically been used as nest trees for bald eagles, and are currently used

by eagles for perching. Bald eagles are currently regulated by the Bald and Golden Eagle Protection Act (BGEPA) and the Migratory Bird Treaty Act (MBTA), and activity within the vicinity of these trees is restricted (see INRMP Section 6.4.1 and Appendix F). In addition, activity is restricted in wetland, shoreline, and riparian areas and their buffers (see INRMP Section 6.5.4)

3.3 Urban Forest

The urban forest is located throughout the built environment of Camp Murray, and consists of a mixture of native and ornamental trees, including Oregon oak, Pacific madrone, and big-leaf maple. The WAANG conducted an inspection of urban trees near its facility in July 2007, which identified several hazard trees, and some damage to sidewalks from tree roots (E²M 2007). In June 2008, a hazard tree evaluation and maintenance study was conducted on the portion of the Camp Murray property used by the WAARNG (Sound Urban Forestry 2008). A total of 245 trees were evaluated, with 95 trees recommended as Priority No. 1 for trimming and 40 trees as Priority No. 1 for removal. Priority No. 2 trees included 53 trees for trimming and 23 trees for removal. Hazard tree trimming (Priority No. 1 trees) was completed in September 2008, while hazard tree removal (Priority No. 1 and No. 2 trees) was completed in October 2008. Priority No. 2 trees for trimming will be scheduled for pruning in 2010. Priority No. 3 (22 trees) will be monitored and scheduled for removal within the next three to five years. Annual evaluation of hazard trees at Camp Murray was proposed for NGB's Status Tool for the Environmental Program (STEP) funding. Another hazard tree evaluation will be conducted in 2010, and subsequent hazard tree removal/trimming will be scheduled according to the recommendations of the study.

4. MANAGEMENT RECOMMENDATIONS

General guidelines for forest management at Camp Murray focus on a few key concepts.

- Avoid fragmentation of habitat types;
- Control invasive plant species;
- Maintain tree health;
- Enhance wildlife habitat;
- Protect and enhance Oregon oak trees and woodlands; and
- Meet federal, state, and county requirements for sensitive habitats and species, including Oregon oak woodlands, bald eagles, wetlands, shorelines, and riparian areas.

The following provides facility-wide (FG) management guidelines, and specific guidelines for management of the three forest types found on Camp Murray.

4.1 Facility-wide Guidelines

- FG-1:** Conduct pre-development tree inventories for all proposed development to allow environmental staff to evaluate the loss, identify permitting requirements, and determine mitigation and/or alternatives if possible.
- FG-2:** Prepare a Tree Management Plan as part of each new planning and construction project at Camp Murray. For each proposed project, the Tree Management Plan will include information from the pre-development tree inventory (FG-1), and all regulatory requirements pertinent to the proposed project.
- FG-3:** Retain all trees deemed 'significant' according to Pierce County Municipal Code (18H.40.040) throughout the Camp Murray installation, except when the tree is deemed to be a hazard tree by a certified arborist or CFMO-Env staff.
- FG-4:** No tree is to be removed without prior consultation with CFMO-Env staff to ensure the proposed action complies with all applicable laws and sound ecological principles.
- FG-5:** Compensate for unavoidable tree removals by replanting replacement trees as near to the physical area of impact as possible. Trees proposed for replanting will conform to specifications outlined in the Pierce County Municipal Code (18H.40.050).
- FG-6:** Establish and maintain Root Protection Zones around trees during construction and around trees in parking areas. The root protection zone must conform to specifications outlined in the Pierce County Municipal Code (18H.40.070). No dumping, clearing, or digging will occur within the root protection zones.

FG-7: Conduct annual hazard tree inventories each spring to be completed by a qualified arborist/urban forester. Annual inventory will include an annual report that contains recommendations for hazard removal, control, and prevention.

FG-8: Inspect trees for damage after severe storms or earthquakes.

FG-9: No attachments to trees, such as signs, are allowed. Flagging and signs that have been attached to trees will be removed once their intended purpose has been satisfied.

4.2 Mixed Coniferous/deciduous Forest (MF)

MF-1: Unused roads will be closed and replanted with appropriate vegetation. No new roads will be developed in forested areas.

MF-2: Snags greater than 20 inches in diameter at breast height (dbh) and greater than 6.5-feet tall, and downed logs greater than 12 inches in diameter and greater than 20-feet long are considered as Priority Habitats by the WDFW (WDFW 2007), and will be left in place, when feasible, to facilitate the development of a more complex forest structure. Where safety is a concern, tall snags can be cut as low as 6.5 feet and still provide wildlife habitat values.

MF-3: Remove invasive species such as Himalayan blackberry and English ivy from all forested areas.

MF-4: Limit activities within the Bald Eagle Management Zone (Figure 8). Activities that can potentially interfere with the bald eagles that nest and forage in the vicinity of the camp are prohibited by the BGEPA. A Bald Eagle Management Plan (BEMP) for Camp Murray, developed by the E²M for the WAANG in 2007, is included as Appendix F of the INRMP. The BEMP provides detailed guidance regarding restriction to activities within the two previously identified nesting sites. These requirements should be followed by the WAARNG on Camp Murray to ensure that the facility complies with all applicable laws.

MF-5: Maintain a 200-foot wide undisturbed area from the American Lake shoreline. The American Lake shoreline is protected under the Shoreline Management Act. Pierce County's shoreline management regulations require a 200-foot setback from the ordinary high water mark of American Lake, or from the landward edge of wetlands contiguous with the lake and shoreline. Development within the setback, including paving of gravel roads, would require a shoreline substantial development permit administered by Pierce County and possibly a conditional use permit, also administered by the County.

MF-6: Maintain undisturbed buffers around wetlands and riparian areas. Wetland buffers will be established as follows (see INRMP Section 6.5.4): 75 feet for low impact use, 110 feet for moderate impact use, and 150 feet for high impact use. The buffer around Murray Creek will be 50 feet.

MF-7: Trees will be inspected annually by a certified arborist or forester for the presence of disease, pests, or hazard.

4.3 Oak Woodlands (OW)

The following management recommendations are in accordance with the WDFW's Management Recommendations for Washington's Priority Habitats: Oregon White Oak Woodlands (Larsen and Morgan 1998).

OW-1: Inspect and remove Douglas fir trees that have been diagnosed with laminated root rot in OMZ-4. All trees surrounding the pocket of infestation will be inspected for laminated root rot or other disease.

OW-2: Facilitate the development of the native understory by limiting clearing and mowing in oak woodlands. In oak woodlands that must be maintained to support the military mission (i.e., in portions of OMZ-3 that are near buildings), Camp Murray maintenance staff will work with CFMO-ENV staff to identify which areas will be allowed to develop a native understory.

OW-3: Remove invasive plants such as Scotch broom and Himalayan blackberry from the understory in all OMZs, especially in OMZ-4.

OW-4: Restore the oak woodland understory by installing plants typically found in this forest type such as snowberry, hazelnut, and tall Oregon grape.

OW-5: Remove Douglas fir trees that have encroached into the oak forest and are shading out oaks.

4.4 Urban Forest (UF)

UF-1: Conduct a hazard-tree inventory each spring to be performed by a qualified arborist/urban forester. Trees within reach of structures or high use areas (e.g., parking areas, recreation facilities, trails, roads) should be inspected each year for:

- dead branches or tops;
- overall health;
- amount of "sail" (a measure of branch density that can catch wind and cause trees to blow over);
- stem or bark damage;
- encroachment on power lines, telephone lines or antennae;
- disease;
- split tops; or
- other deformities or situations that may result in trees or parts of trees falling and endangering people, structures, infrastructure, or vehicles.

The inventory will include an annual report with prioritized recommendations for hazard removal, control, and prevention.

UF-2: Establish root protection zones for trees near parking areas to avoid damage to tree roots. The protection zone should be clearly marked to ensure compliance.

5. Proposed Projects

Planned projects at Camp Murray related to forest management are discussed in detail in the INRMP. Refer to Chapter 7 and Table 6 in the Camp Murray INRMP.

- **Project 3.1.1:** Update and Implement the Camp Murray IPMP
- **Project 3.1.2:** Invasive Plant Species Control
- **Project 3.3.1:** Woodland Restoration
- **Project 3.3.2:** Maintenance and Protection of Restored Areas
- **Project 3.5.1:** Forest Plant Community and Wildlife Habitat Features Inventory and FMP Update
- **Project 3.5.2:** Maintenance of existing forest trees and restoring degraded forest areas
- **Project 4.1.1:** Installation of Interpretive Signs

6. Conclusion

This FMP has been developed concurrently with the Camp Murray INRMP, and is subject to the same five-year implementation period. Per DoD policy, the five-year period will begin from the day of adoption of the National Guard Bureau-approved final INRMP and FMP by the WAARNG. The WAARNG will conduct annual reviews of this FMP, concurrently with annual INRMP reviews to determine the need for revised management strategies for forest resources at Camp Murray. This FMP will be revised with the INRMP after a five-year period to guarantee opportunities for adjustment and adaptive management.

Implementation of this FMP is expected to result in improvements in the condition of forest resources on Camp Murray, including increased plant species and structural diversity, improved safety for people and property on Camp Murray, and enhanced wildlife habitat for sensitive species. In addition, implementation of this FMP will ensure that Camp Murray complies with all applicable laws pertaining to forest resources on the installation.

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