CONVOY LIVE FIRE RANGE
AT
JOINT BASE LEWIS-MCCHORD
YAKIMA TRAINING CENTER
ENVIRONMENTAL ASSESSMENT

December 2012

Prepared for:

Joint Base Lewis-McChord Yakima Training Center

and

U.S. Army Environmental Command

Prepared by:

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FINDING ON NO SIGNIFICANT IMPACT (FNSI)

CONVOY LIVE FIRE (CLF) RANGE AT JOINT BASE LEWIS-MCCHORD YAKIMA TRAINING CENTER (JBLM YTC)

Introduction

Headquarters, Department of the Army (DA) has programmed the construction of a Convoy Live Fire (CLF) Range in Fiscal Year 13 at Joint Base Lewis-McChord Yakima Training Center (JBLM YTC) as part of the Army Master Range Program. It has been determined by the DA Assistant Chief of Staff, Operations and Plans (G-3) that this range is required to train Active Component Units stationed at JBLM. JBLM YTC has prepared an Environmental Assessment (EA) to identify and evaluate potential adverse environmental effects associated with the Proposed Action— construction of a CLF range at JBLM YTC, Washington.

The purpose for this action is to address a range short-fall for a CLF Range at JBLM YTC by providing a year-round, comprehensive and realistic live-fire training and range facility. Construction and designation of a permanent CLF Range area would provide JBLM YTC with the capability to fully support mission-essential training tasks for CLF and train Soldiers to effectively respond to attacks on convoys in theater (e.g., ambushes, snipers, Improvised Explosive Devices). There is a need for a dedicated range that would improve efficiency, effectiveness, and reduce impacts on existing land uses and resources from its use. CLF training is a mission essential task that all Army units must complete prior to deployment, and in accordance with DA G-3 requirements. A CLF Range is needed at JBLM YTC to support training requirements for military units that train at JBLM YTC. In accordance with both Council on Environmental Quality (CEQ) and Army National Environmental Policy Act (NEPA) regulations (40 Code of Federal Regulations [CFR] 1508.13 and 32 CFR 651.21 respectively), this FNSI hereby incorporates the entire EA by reference.

1. Description of the Proposed Action and Alternatives

Proposed Action: The Proposed Action is to construct, operate, and maintain a CLF Range to Army Training Circular 25-8, *Training Ranges*, standards at JBLM YTC.

Alternatives Considered and Evaluated: Chapter 2 of the EA presents a discussion of the alternatives evaluated. Four sites were initially considered during site planning, which included Training Area (TA) 12 Range 15, TA 11 Range 10, TA 6 and TA 4. Based on the screening criteria analysis presented in Section 2.3 of the EA, only one of the four sites considered, TA 12 (Range 15) fully met the five required screening elements and was carried forward for evaluation in the EA.

No Action Alternative – Under the No Action Alternative, the CLF Range would not be constructed. JBLM YTC would continue to utilize sub-optimal, temporary ranges for CLF training that do not provide Soldiers with optimal quality training.

Proposed Action Alternative – A CLF Range would be constructed, operated, and maintained at JBLM YTC at a site within the Range 15 footprint. Construction of the CLF Range would entail placement of a Range Operations Control Area (ROCA) facility, a parking area for the ROCA facility, an air-vaulted latrine facility, an ammo breakdown area, and targetry. In addition, approximately 3.9 miles of trenching would be required along the existing main road through the site for power and control wires to connect targetry with the ROCA. A 2.2-mile extension of the wired electrical service (power feed) may also be pursued if it is determined to be economically viable to supply power to the ROCA. Construction footprints around the targetry/objectives would have a typical footprint of disturbance of approximately 98 feet (30 meters) around each specific target and approximately 328 feet (100 meters) around moving targets. Establishment of maintenance roads (unimproved roads approximately 10 feet [3 meters] wide)

would also be required for targetry maintenance during operations. Construction would also involve demolition of existing Range 15 target pits.

All targetry would be fully automated, utilizing event-specific, computer-driven target scenarios and scoring. Use of the CLF and Range 15 combined is estimated to be about 242 days per year. Power for the new CLF facility would be provided by two generators (a 60 kilowatt (kW) generator for the ROCA and a 20 kW generator near the Entry Control Point) or via a power feed from the existing ROCA. Convoy movements to the new range would be able to utilize low water crossings at Selah Creek and existing roads within JBLM YTC. During operations, prior to CLF Range training, units would assemble in the ROCA parking area.

2. Environmental Analysis

Environmental Consequences and Comparison of Alternatives: The EA's Chapter 3 discusses the affected environment and potential environmental consequences for the Proposed Action Alternative by valued environmental component (VEC). The No Action Alternative serves as a baseline from which to compare the potential impacts of the Proposed Action Alternative. Due to the nature of the Proposed Action and the nature of effects, it was determined that the following VECs would have negligible adverse effects and were not retained for further analysis within the EA: wetlands, land use, infrastructure and utilities, solid and hazardous waste, noise, and socioeconomics. A summary of potential effects for the VECs retained for further analysis is presented in Table 1. As shown in Table 1, implementation of the Proposed Action is not anticipated to result in adverse significant environmental impacts. Potential permits, plans, and measures to reduce adverse impacts identified within the EA analysis are also included within the table which support the impact determinations presented.

Table 1. Summary of Potential Environmental Effects from Baseline Conditions

VEC	Activity	No Action	Proposed Action	Permits, Plans, and Measures Identified for Reduction of Adverse Impacts
Air Quality and Greenhouse Gas	Construction	No Impact	Less than significant impact	• Prior to construction, the contractor would contact the Yakima Regional Clean Air Agency (YRCAA) to determine the requirements for a Dust Control Plan and appropriate dust control measures. If dust might pose a nuisance or be a detriment to health or safety, preventive measures would be outlined in the Dust Control Plan and implemented by the contractor to prevent airborne dust during construction. • If temporary generators are used for construction, the contractor would contact the YRCAA concerning possible submittal of a Notice of Establishment of Temporary Portable Sources and provide YTC Public Works-Environmental Division with a copy of the notice.
	Operations	No Impact	Less than significant impact	• The control of smoke would be handled by smoke management techniques per the Installation Wildland Fire Management Plan (IWFMP) to meet regulatory and burn permit requirements and to determine the appropriate timing of prescribed fires and firebreak management. • If the Proposed Action pursues the use of the two generators to power the proposed CLF Range, JBLM YTC would coordinate with the Washington Department of Ecology and YRCAA to determine potential permitting or regulatory requirements.

Table 1. Summary of Potential Environmental Effects from Baseline Conditions

VEC	Activity	No Action	Proposed Action	Permits, Plans, and Measures Identified for Reduction of Adverse Impacts
Water Resources	Construction	No Impact	Less than significant impact	• To prevent water quality deterioration, all temporary construction-related footprint disturbances would be revegetated with appropriate plant species. • Unnamed intermittent upland tributary drainages disturbed during trenching and underground utility operations would be restored to their original grades following construction. • A National Pollutant Discharge Elimination System (NPDES) General Permit would be required prior to construction activities. • To minimize impacts to surface water resources, the Construction Stormwater Pollution Prevention Plan (CSWPPP) would be adhered to and would provide protection by ensuring contracts contain language requiring site operators to obtain a NPDES permit and develop a site-specific CSWPPP. The site-specific CSWPPP plan would include best management practices (BMPs) for erosion control and pollution prevention requirements.
	Operations	No Impact	Less than significant impact	• Existing mitigation associated with the 2011 Fort Lewis GTA action includes a requirement for the development of 12 additional storage and dip pond facilities across JBLM YTC. This would help mitigate the increase wildland fire potential due to the new CLF and would further reduce the potential for adverse impacts of wildland fire spread and sediment entering Selah Creek as fires would be suppressed more rapidly. • If necessary, stormwater runoff from the 5.8-acre ROCA area would be managed through site design, including the creation of upland release points.

Table 1. Summary of Potential Environmental Effects from Baseline Conditions

VEC	Activity	No Action	Proposed Action	Permits, Plans, and Measures Identified for Reduction of Adverse Impacts
Biological Resources	Construction	No Impact	Less than significant impact	• Temporary construction-related footprint disturbances would be revegetated with appropriate species. Ground cover revegetation would occur on-site at a 1:1 ratio (up to 32.7 acres disturbed, requiring up to 32.7 acres revegetated) and disturbances to shrub-steppe vegetation (sage-grouse habitat) would be mitigated through off-site restoration at a 3:1 ratio (up to 12.0 acres disturbed, requiring up to 36.0 acres restored). These measures would also serve to reduce the spread of noxious weeds; however, noxious weed management may be necessary to prevent the spread of invasive species in disturbed sites. • In order to further reduce the potential for disturbance to species protected under the Migratory Bird Treaty Act, ground-clearing activities, to the greatest extent possible, would be conducted outside the nesting season (February to August). If ground clearing activities are conducted within the nesting season, the amount of ground clearing activities would be minimized to the greatest extend practical.
	Operations	No Impact	Less than significant impact	• Existing mitigation associated with the 2011 Fort Lewis GTA action includes a requirement for the development of 12 additional storage and dip pond facilities across JBLM YTC. This mitigation would further reduce the potential for adverse impacts of wildland fire spread to biological resources as fires would be suppressed more rapidly. • Protection of newly discovered active leks outside current Sage-grouse Protection Area would be assessed on a case by case basis and may include protective measures outlined in the Sage-grouse Management Plan, which establishes a 1 kilometer protection radius from active lek areas. • To reduce the probability of take, JBLM YTC would, to the greatest extent possible, conduct maintenance activities outside of the MBTA nesting season (February to August).
Cultural Resources	Construction	No Impact	Less than significant impact	• Necessary surveys regarding Traditional Cultural Properties, Sacred Sites, and Areas of Contemporary Native American Use (ACNAUs) would be conducted prior to construction and identified resources would be managed according to the Integrated Cultural Resources Management Plan (ICRMP).
	Operations	No Impact	Less than significant impact	• Any identified resources would be managed according to the ICRMP during operations of the proposed CLF Range.

Table 1. Summary of Potential Environmental Effects from Baseline Conditions

VEC	Activity	No Action	Proposed Action	Permits, Plans, and Measures Identified for Reduction of Adverse Impacts
Soil Resources	Construction	No Impact	Less than significant impact	• BMPs specified in the Installation's Cultural and Natural Resources Management Plan and the operator's CSWPPP would be implemented to control water runoff and erosion and establish permanent vegetation cover through seeding and re-establishment of desirable vegetative cover at sites disturbed during construction to 70 percent of pre-disturbance cover levels. • Range construction would require compliance with the NPDES permit and may require a site-specific Erosion Control Management Plan, or equivalent.
	Operations	No Impact	Less than significant impact	• Ongoing land management would maintain a desirable vegetative cover to minimize bare soil condition sites; limiting exposed soils to areas in and around targetry, and other improved sites, such as parking areas in and around the ROCA.
Wildland Fire	Construction	No Impact	Less than significant impact	• Construction of the CLF Range would require pre-incident plans, firebreaks, and other essential wildland fire management procedures as part of construction management plans.
	Operations	No Impact	Less than significant impact	• Impacts would be reduced through existing Integrated Wildland Fire Management Plan procedures, including the review and potential expansion of primary and secondary containment areas on adjacent land; developing pre-incident wildland fire plans specifically for the new CLF Range; firebreak maintenance to adequately compartmentalize potential fires due to the CLF Range; restrictions on the use of pyrotechnics on high fire danger days; and prescribed burns in areas where fires frequently recur. • Existing mitigation associated with the 2011 Fort Lewis GTA action includes a requirement for the development of 12 additional storage and dip pond facilities across JBLM YTC would help mitigate wildland fire due to the new CLF Range.

Cumulative Impacts: Cumulative effects are the combination of impacts of the Proposed Action, when added to other past, present, and reasonably foreseeable future actions, regardless of who undertakes those other actions (Council on Environmental Quality [CEQ] Regulation 1508.7). Cumulative effects can result from actions occurring over a period of time that are minor when each is considered individually, but may be significant when viewed collectively.

JBLM YTC is used for multiple types of training including gunnery, demolition, construction, off-road maneuver and aviation related operations, while the land surrounding JBLM YTC is used mostly for agricultural and livestock purposes. At Range 15 specifically, current uses are primarily as a tank gunnery range that supports firing of both small and large caliber weapon systems. Reasonably foreseeable future actions that are expected to take place on or around JBLM YTC, or were determined to have a potential cumulative effect regarding the Proposed Action included in this analysis include 17th Fires Brigade Firebases; Multi-Purpose Machine Gun Range; Pacific Power Powerline Project: Vantage to Pomona Heights; Realignment, Growth, and Stationing of Army Aviation Assets at JBLM YTC; Vantage Wind

Power Project; Washington Army National Guard Tactical Unmanned Aerial System Training Facility; Urban Operations Village; Sniper Field Fire Range; Combined Arms Collective Training Facility; and the Yakima Basin Integrated Water Resource Management Plan, if fully implemented.

The range development projects and realignment, growth, and stationing projects generally indicate a cumulative increase in the development and use of training facilities at JBLM YTC. Increased construction and training at JBLM YTC would cause the potential for significant cumulative adverse impacts to the VECs analyzed within the EA. Limited other actions outside of JBLM YTC (powerline and wind projects) were determined to have the potential to cause cumulative adverse effects. The Yakima Basin Integrated Water Resource Management Plan was viewed as a beneficial cumulative impact to watershed management and improvement of water resources within the Yakima Basin.

As the Proposed Action would have the potential for adverse impacts to air quality and greenhouse gases, water resources, biological resources, cultural resources, soil resources and wildland fires, these VECs were reviewed in Chapter 3 of the EA to determine whether or not implementation of the Proposed Action would cause the potential for significant adverse cumulative effects to these VECs. The cumulative effects analysis of these VECs within the EA determined that the Proposed Action would not likely cause any appreciable significant cumulative impacts.

Proposed Impact Reduction Measures: As demonstrated in Table 1, impacts resulting from the Proposed Action would be less than significant; therefore, no mitigation would be required. Various permits, plans, and measures, however, have been identified within the EA analysis that would be undertaken by JBLM YTC to further minimize adverse effects.

3. Public Review and Comment

The Draft EA/Finding of No Significant Impact (FNSI) on the CLF Range has been made available for a 30-day public review and comment period. Documents have also been made available at the Yakima Valley Regional Library (102 N. 3rd Street, Yakima, Washington), and the Ellensburg Public Library (209 N. Ruby, Ellensburg, Washington). A Public Notice was published in two local newspapers (Yakima Herald Republic, and The Daily Record). All documents have been posted on http://www.lewis.army.mil/publicworks/sites/envir/eia_backup.htm. No comments were received during the comment period.

4. Finding of No Significant Impact

I have considered the results of the analysis in the EA; the comments received during the public comment period, and associated cumulative effects. Based on these factors, I have decided to proceed with the Proposed Action Alternative, construction and operation of a CLF Range at a site within the JBLM YTC Range 15 footprint. Implementation of the Proposed Action, along with specified permits, plans, and measures identified above will not have a significant impact on the quality of the human life or natural environment. This analysis fulfills the requirements of the National Environmental Policy Act of 1969 as implemented by the Council on Environmental Quality regulations (40 CFR Parts 1500-1508), as well as the requirements of the Environmental Analysis of Army Actions (32 CFR Part 651). Therefore, issuance of a FNSI is warranted and an Environmental Impact Statement is not necessary.

_____ _____

R. Darrell O'Steen, Jr. Date
Lieutenant Colonel, U.S. Army
Commanding
Joint Base Lewis-McChord Yakima Training Center

CONVOY LIVE FIRE RANGE
AT
JOINT BASE LEWIS-MCCHORD YAKIMA TRAINING CENTER
ENVIRONMENTAL ASSESSMENT

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Appendix A – Status of Migratory Bird Species on JBLM YTC

1. BACKGROUND

The National Environmental Policy Act (NEPA) of 1969 requires all Federal agencies to give appropriate consideration to potential environmental effects of proposed major actions in planning and decision-making. The Council on Environmental Quality (CEQ) is responsible for issuing regulations (40 Code of Federal Regulations [CFR] 1500-1508) implementing the provisions of NEPA. CEQ regulations in turn are supplemented by procedures adopted on an agency-specific basis. For the Department of the Army (DA), the pertinent regulation is CFR 651 *Environmental Analysis of Army Actions*.

Headquarters, DA has programmed the construction of a Convoy Live Fire (CLF) Range in Fiscal Year (FY) 13 at Joint Base Lewis-McChord Yakima Training Center (JBLM YTC) as part of the Army Master Range Program. It has been determined by the DA Assistant Chief of Staff, Operations and Plans (G-3) that this range is required to train Active Component units stationed at JBLM.

1.1 Installation Setting

JBLM YTC is a training installation located in central Washington northeast of the City of Yakima and west of the Columbia River (Figure 1-1). JBLM YTC encompasses approximately 327,200 acres in Yakima and Kittitas counties. Active Army units assigned to JBLM and the 81st Heavy Brigade Combat Team of the Washington Army National Guard (WAARNG) are the principal users of JBLM YTC. Other Army, Department of Defense (DoD), and Allied Nation forces also use JBLM YTC, which includes the Special Operations Command, Marine Corps, Air Force, Navy, Coast Guard, local and Federal law enforcement, and forces from Canada, Japan, and other allied nations.

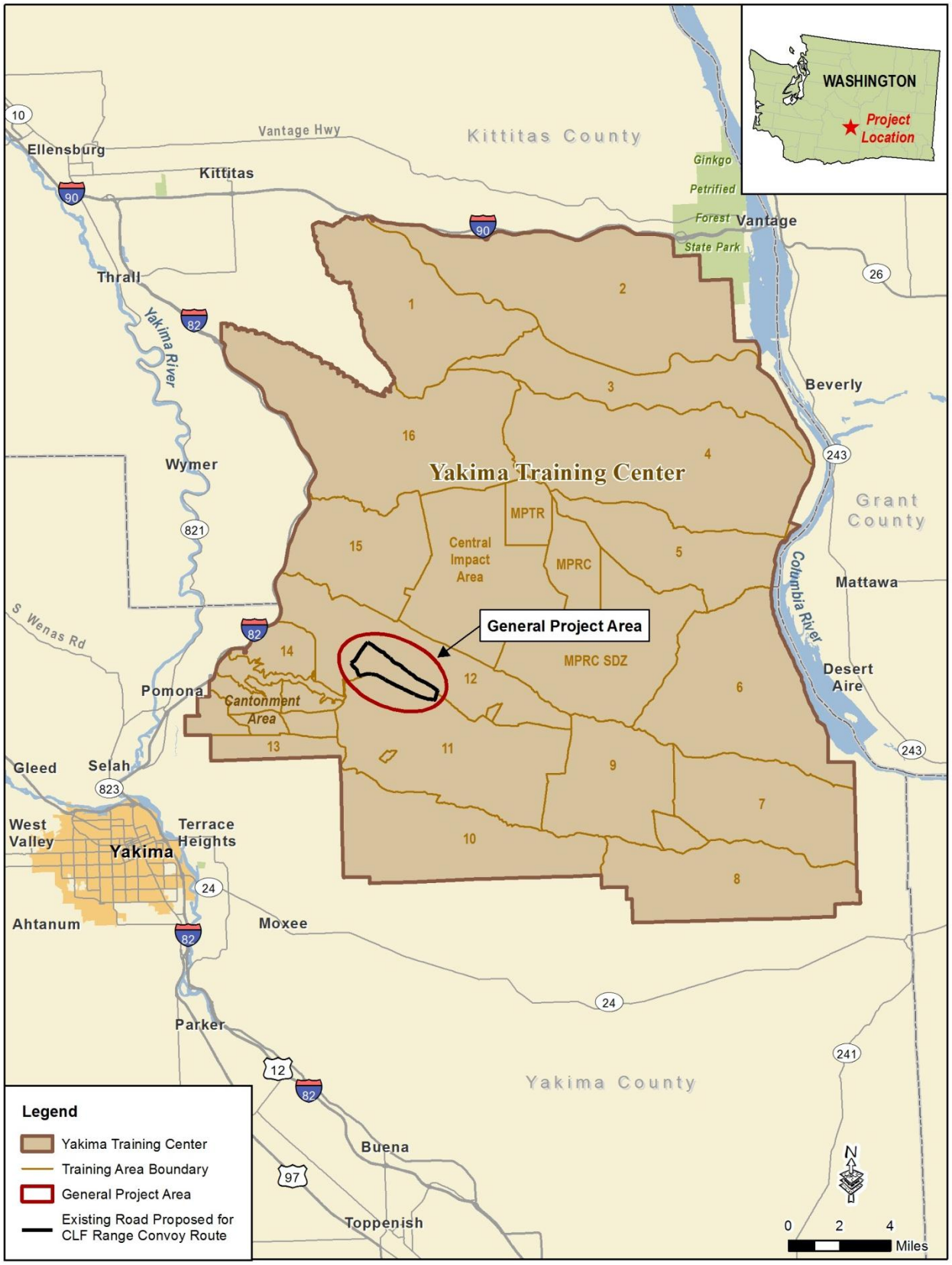
Currently, JBLM YTC plays a major role as part of the Stryker Center of Excellence. The Center of Excellence is responsible for concept development, compilation and distribution of lessons learned, and development of technical and tactical expertise for Stryker Brigade Combat Teams (SBCTs).

1.2 Purpose

The purpose for this action is to address a range short-fall for a CLF Range at JBLM YTC by providing a year-round, comprehensive and realistic live-fire training and range facility. Construction and designation of a permanent CLF Range area would provide JBLM YTC with the capability to fully support mission-essential training tasks for CLF and train Soldiers to effectively respond to attacks on convoys in theater (e.g., ambushes, snipers, Improvised Explosive Devices (IEDs)). The proposed CLF Range would also meet the CLF Range requirements of Training Circular (TC) 25-8, *Training Ranges*.

CLF Ranges are used to train and test Soldiers, crews, and units on the skills necessary to detect, identify, engage, and defeat stationary and moving vehicle and infantry targets from moving vehicles using all assigned weapons and weapon systems. The targets may be presented individually or as part of a tactical array in an open or urban environment. In addition, CLF Ranges are also used to train Soldiers to engage and defeat vehicle and infantry targets from multiple firing points as part of an Entry Control Point (ECP) of a Forward Operating Base.

The CLF Range uses simulation technologies (e.g., thermal targets, night illumination devices, and visual flash simulators) to provide Soldiers with the best realistic training environment. This range also incorporates state-of-the-art technology to support all phases of training, from ground maneuver and target engagement to the critical after-action review (training feedback) phase. This support and timely feedback are critical to effective training. Because of the training on this proposed range, Soldiers would go into battle with the best possible training for threats the Army expects to encounter during combat operations.



Source: ESRI, 2010; Yakima Training Center, 2011. Created by PHE, February 2012.

Figure 1-1. Installation and Project Setting

1.3 Need

There is a need for a dedicated range that would improve efficiency, effectiveness, and reduce impacts on existing land uses and resources from its use. CLF training is a mission essential task that all Army units must complete prior to deployment, and in accordance with DA G-3 requirements. A CLF Range is needed at JBLM YTC to support training requirements for military units that train at JBLM YTC. Currently, CLF training is conducted at various temporary and improvised range sites within JBLM YTC that do not fully meet the requirements for Training and Targetry Objectives for a CLF Range facility (per TC 25-8, Appendix D-26 through D-27, Convoy Live Fire Range); only about 70 percent of CLF activity training requirements are currently met. Soldiers, crews, platoons, and companies must train in a live-fire mode to accurately replicate those tasks they must perform in combat operations. Prior to deploying to an overseas area of operations, all personnel and all units are required to participate in a CLF exercise on an Army standard CLF Range.

The current method for CLF training has also resulted in impacts to other land use (e.g., training) activities caused by surface danger zone (SDZ) requirements (e.g., SDZs cannot extend off the Installation, and SDZs must remain clear of all personnel while the range is in use), and has resulted in impacts to natural resources (e.g., resulting from wildland fires). Potential locations where such temporary ranges can be set up are also limited by areas where temporal and spatial land use constraints occur and sites where accessibility or terrain limitations exist (e.g., no suitable route in or out of an area).

1.4 Scope of the Analysis and Decision to be Made

This Environmental Assessment (EA) addresses environmental, cultural, and socioeconomic impacts at JBLM YTC from construction and operation of the proposed CLF Range. This site-specific EA has been developed in accordance with NEPA; the regulations issued by CEQ, 40 CFR Parts 1500–1508; and the Army's implementing procedures published in 32 CFR Part 651, *Environmental Analysis of Army Actions.*

The decision to be made by the Army is whether or not to carry out the construction of a CLF Range at JBLM YTC as presented in Section 2.4.2. The decision-maker would use the analysis presented in this EA to determine if a Finding of No Significant Impact (FNSI) will be published. If it is determined that the Proposed Action would have significant environmental impacts, the decision-maker would decide to publish a Notice of Intent, leading to the preparation of an Environmental Impact Statement (EIS).

1.5 Related Environmental Documentation

The following documents (incorporated by reference) contain previous environmental analyses of the Fort Lewis Transformation, Base Realignment and Closure, and the evolution of day-to-day operations:

- The *Environmental Impact Statement for Army Growth at Fort Lewis and the Yakima Training Center, WA* (U.S. Army, 2010) analyzes the addition of Soldiers at Fort Lewis and the potential stationing of additional units to support Army Growth and Transformation. The EIS also documents the analysis of effects from pertinent past, present, and reasonably foreseeable future actions connected to the Grow The Army actions which include the training of three SBCTs simultaneously at JBLM YTC with the Grow the Army (GTA)-directed new units being stationed and the other units already training at JBLM YTC. The analysis also considers construction of the facilities necessary to support these units.
- The *Cultural and Natural Resources Management Plan* (CNRMP) guides the implementation of a natural and cultural resources program at JBLM YTC to ensure that the Installation complies with applicable environmental laws and regulations (U.S. Army, 2002). The CNRMP describes the procedures and best management practices (BMPs) used at JBLM YTC to ensure that impacts to the natural and cultural environment from construction, training, and operational activities are reduced.

- The *Integrated Cultural Resources Management Plan* (ICRMP) (ICI et al., 2008) guides implementation of the cultural resources management program on JBLM YTC. The Plan integrates legal requirements for cultural resources preservation into the everyday operation of the JBLM YTC military mission and is an integral component of the YTC Master Plan.
- The *Construction Stormwater Pollution Prevention Plan* (CSWPPP) (Kurtz, 2010) implements the basic Installation-wide CSWPPP for small and large construction activity at JBLM YTC, and provides guidance to operators of JBLM YTC construction projects performed by DoD training units, JBLM YTC personnel, and privately owned construction contractors. The plan aims to reduce soil erosion and minimize storm water pollutants during construction.
- The *Integrated Pest Management Plan* (IPMP) (Nissen and Cochrane, 2005) describes the Installation's pest management requirements, outlines the resources necessary for surveillance and control, and describes the administrative, safety, and environmental requirements of the pest management program.
- The *JBLM YTC Integrated Wildland Fire Management Plan* (IWFMP) (JBLM YTC, 2012) establishes wildland fire risks, management goals, and strategies that will be used to reduce the risk and improve JBLM YTC's ability to reduce fire losses.

1.6 Public and Agency Involvement

As required by NEPA regulations, the Army invites public participation in the EA process. Comments from all interested persons promote open communication and enable better decision making. All agencies, organizations, and members of the public with a potential interest in the Proposed Action, including minority, low-income, disadvantaged, and Native American groups, will be provided the opportunity to participate in this process.

A 30-day public review period was conducted on the Draft EA. Notices were placed in the Yakima Herald Republic and The Daily Record regarding the availability of the Draft EA, the duration of the public comment period, and how to obtain information about the Draft EA and provide comments. Copies of the Draft EA were also placed at the Yakima Valley Regional Library (102 N. 3rd Street, Yakima, Washington), and the Ellensburg Public Library (209 N. Ruby, Ellensburg, Washington). The Draft EA was also placed for review on JBLM's website at the following URL address: http://www.lewis.army.mil/publicworks/sites/envir/eia_backup.htm. No comments were receieved during the public comment period.

2. DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

2.1 Proposed Action

The Proposed Action is to construct, operate, and maintain a CLF Range to Army TC 25-8 standards at JBLM YTC. As stated in Section 1.3, the proposed CLF Range would eliminate the need for various temporary and improvised range sites for CLF Range training at JBLM YTC and would not result in an increase of the number of Soldiers training at JBLM YTC. The required targetry for the CLF Range is as follows: 43 Stationary Infantry Targets (SITs); 5 Stationary Armor Targets (SATs); 3 Moving Infantry Targets (MITs); and 4 Moving Armor Targets (MATs). Targets are arrayed along a linear course road at various distances on both sides of the road. Soldiers must engage pop-up and moving targets from stationary and moving vehicles. The Range Operations Control Area (ROCA) would consist of an operations and storage building, ammo breakdown building, latrine, and equipment. Hard-wired electrical power is preferred to operate range targetry; however, it is not required as generators could be used. No water or sewer would be required for the range; however, trenching would be required for the placement of buried utility lines within the range for power and communication/control lines that would operate targetry. Such trenches and utility lines would be located along the main route through the range, and would link the ROCA with the various targetry associated with the range.

2.2 Screening Criteria

This section presents the screening criteria used to consider alternatives to be analyzed in the EA and carried forward as viable alternatives. Alternatives were considered based on different locations within training areas (TAs) on JBLM YTC for the Proposed Action. The criteria (elements) described below are annotated as "required" or "preferred". Suitable alternatives that would meet the purpose and need for the action must satisfy all required elements to be considered further. Preferred elements, while desirable, would not cause an alternative to fail to meet the purpose and need for the Proposed Action.

Within Existing Range and/or SDZ Footprint. (Required) Existing SDZ must accommodate .50 caliber (CAL), either with or without deviation. By siting within an existing Range/SDZ, other land use conflicts are avoided.

Year-Round Accessibility. (Required) The CLF Range would be used year-round; therefore, improved routes must access the site to allow year-round use of the new facility.

Existing Improved Road Within the Site. (Required) An improved road (e.g., Mil-Class 3) must exist within the site to allow placement of the CLF targetry along an improved route.

Site is Suitable To Support All TC-25-8 Design Requirements. (Required) Site must be large enough and of suitable terrain to properly accommodate all design requirements found in TC-25-8.

Land Use Constraints Do Not Exist For The Site (Temporal and/or Spatial). (Required) No existing land use constraints are in place that would reduce the availability or use of the new facility (e.g., seasonal and spatial constraints such as bald eagle areas along Columbia River and Hanson Creek, and sage grouse protection areas).

Within 10,000 Feet of Hard Power. (Preferred) Source of power is available and has adequate capacity. The CLF Range does not require hard power to function. Generator power would adequately suffice to operate this range since the power requirements are generally low.

Within Existing Wildland Fire Containment Area. (Preferred) Targetry and SDZ (tracer burn out range) is within an existing containment area.

2.3 Results of Screening Criteria

The results of comparing the four alternatives to the screening criteria are illustrated at Table 2-1.

Table 2-1. Screening Criteria Results for the Initial Four CLF Range Sites

Screening Elements	Alternative Sites			
	TA 12 (Range 15) Site	**TA 11 (Range 10) Site**	**TA 6 Site**	**TA 4 Site**
1. Site is within an existing range and/or SDZ footprint	✓	✓	≠	≠
2. Site is accessible year-round	✓	✓	≠	≠
3. An improved road exists within the site to construct the CLF Range features along	✓	✓	✓	✓
4. Site is suitable to support all requirements of a CLF Range, in accordance with TC 25-8	✓	✓	✓	✓
5. Land use constraints are not in place that would limit use of the new facility (temporal and/or spatial constraints)	✓	≠ (sage grouse protection area issues)	≠ (year-round Native American access issues)	✓
6. Within 10,000 feet of hard power	≠	≠	≠	✓
7. Site is within an existing wildland fire containment area	✓	✓	≠	≠
Summary Results	1 (fully meets all required elements, and meets one of two preferred elements)	2 (fully meets 4 of 5 required elements and partially meets one required element; and does not meet one preferred element)	4 (meets 2 of 5 required elements and partially meets one required element; and fails to meet both preferred elements)	3 (meets 3 of 5 required elements; and meets one of two preferred elements)

✓ Meets Screening Element
≠ Does not meet Screening Element

One of the four sites considered, TA 12 (Range 15) fully met the five required screening elements; this site is evaluated as the Proposed Action Alternative in this EA. The remaining three alternatives failed to fully meet all required screening elements, and would not meet the purpose and need for a CLF Range at JBLM YTC. These three alternatives, therefore, will not be considered further for this action within the EA.

2.4 Alternatives Carried Forward for Consideration

2.4.1 NO ACTION ALTERNATIVE

The No Action Alternative serves as a baseline from which to compare all other reasonable alternatives and is not analyzed as a viable option to accomplish the Proposed Action. Under the No Action Alternative, the CLF Range would not be constructed. JBLM YTC would continue to lack capability to train Soldiers to effectively respond to attacks on convoys in theater (e.g., ambushes, snipers, IEDs). JBLM YTC would continue to utilize sub-optimal, temporary ranges for CLF training that do not provide Soldiers with optimal quality training. This could degrade training for Combat Service Support units in particular, many of which are Reserve and National Guard units. This alternative does not meet the Purpose and Need.

2.4.2 PROPOSED ACTION ALTERNATIVE

A CLF Range would be constructed, operated, and maintained at JBLM YTC at a site within the Range 15 footprint. Range 15 is located within JBLM YTC TA 12 (see Figure 2-1).

2.4.2.1 Construction

Construction of the CLF Range would involve approximately 45.2 acres of ground disturbance. Construction activities include the placement of a 5.8-acre ROCA facility which includes an approximately 800-square-foot building, a parking area for the ROCA facility, an air-vaulted latrine facility, an ammo breakdown area, and targetry. In addition, trenching (approximately 20 feet wide and 3 feet deep) would be required for installation of underground utilities (fiber optic and electrical cables). Approximately 3.9 miles (9.5 acres) of trenching would be required along the existing main road through the site for power and control wires to connect targetry with the ROCA. A 2.2-mile extension (5.3 acres of trenching disturbance) of the wired electrical service (power feed) may also be considered if it is determined to be economically viable to supply power to the ROCA. The ammo breakdown area would occur within the proposed ROCA parking lot; therefore, no separate area of disturbance for this activity would be required. Figure 2-1 highlights the potential area of disturbance resulting from construction activities.

Construction footprints around the targetry/objectives[1] would have a typical footprint of disturbance of approximately 98 square feet (30 meters) around each specific target and approximately 328 square feet (100 meters) around moving targets. Maintenance roads (unimproved roads approximately 10 feet [3 meters] wide) required for targetry maintenance during operations would be placed within each construction footprint to minimize overall disturbance, and fiber optic and electrical connections would be located along/underneath these maintenance roads for protection during CLF Range training. Total area of disturbance from construction of the targetry/objectives and maintenance roads is approximately 24.6 acres.

Construction would also involve demolition of existing Range 15 target pits. Existing berms/fill materials and ecology blocks onsite would be reused and kept onsite to reconfigure objectives and the ECP. There would be no offsite transport of these materials from demolition activities; reuse of these materials would be incorporated into the CLF Range design. Three existing borrow pits would be used, as necessary, for additional fill materials needed for construction of barriers/berms. Existing roads would be utilized to transport any fill materials to the CLF Range site.

[1] CLF Ranges involve placement of targets (e.g., SITs, SATs, MITs, MATs) in various clusters to form objectives. Each objective is meant to simulate a specific scenario that a convoy could encounter while traveling to and from the battlefield.

Two staging areas have been identified for construction equipment/materials staging (see Figure 2-1). One is an existing approximately 5.4-acre area frequently used for staging (Area 2 of Range 15). The other, approximately 5 acres, would occur within the footprint of the gravel parking area required for the ROCA.

Range 15 would be closed the entire time this is under construction (approximately 1 year). During this period all training that would have occurred in this range would take place in the Digital Multi-purpose Range Complex on the east side of the Central Impact Area.

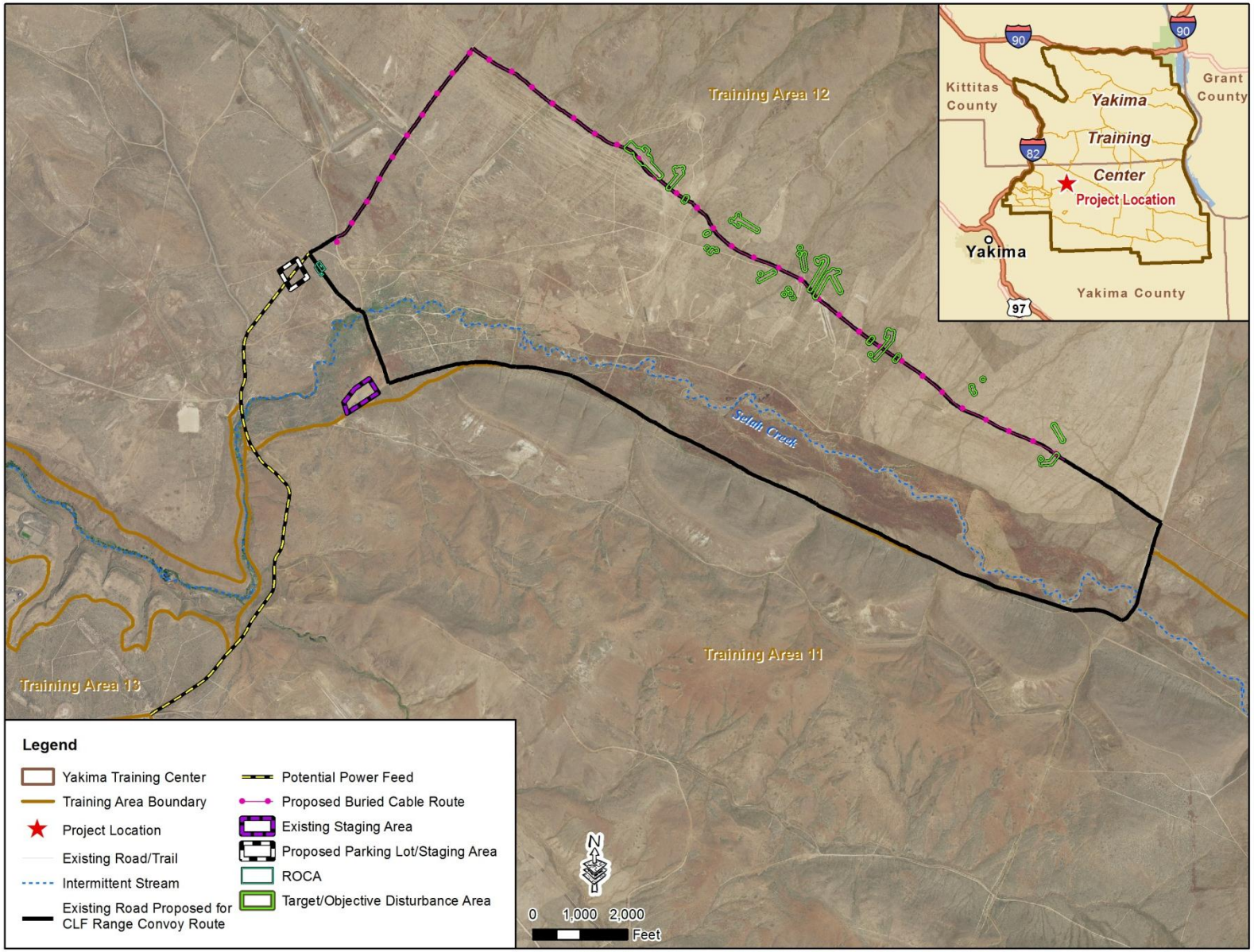
2.4.2.2 Operations

All targetry would be fully automated, utilizing event-specific, computer-driven target scenarios and scoring. Targets would receive and transmit digital data from the ROCA. Use of the CLF and Range 15 combined, is estimated to be about 242 days per year. Since this location is over 10,000 lineal feet from Range Operations (current end of hard wired electrical service lines), power for the new CLF facility could be provided by two generators as opposed to the power feed trenching previously discussed (a 60 kilowatt (kW) generator for the ROCA and a 20 kW generator near the ECP). The CLF Range would not require vault latrines or running water. As stated in Section 2.4.2.1, fiber optic and electrical cables would be run from the ROCA to targetry. No connections would be required to the main JBLM YTC fiber optic system.

Range 15 is a tank gunnery range that supports firing of both small and large caliber weapon systems. CLF training utilizes small arms calibers (i.e., up to .50 CAL); hence existing SDZs for Range 15 would accommodate the SDZs required to support weapon systems used by the CLF Range. Vegetation within the proposed CLF Range has been extensively altered in the past, as a result of repeat wildland fires and from digging and other off road maneuver activities that have occurred at Range 15. Placement of the CLF within this footprint enables use of the existing improved road network for placement of the targetry, and use of existing wildland fire protection features (e.g., firebreaks and containment area boundaries).

Convoy movements to the new range would be able to utilize low water crossings at Selah Creek and existing roads within JBLM YTC. CLF training would occur along the northern road heading east, and a designated return route heading west back to the ROCA has been established along an existing road along the southern edge of the proposed range (see Figure 2-1). Future site-specific needs for reoccurring maintenance are anticipated for operations, which would include road maintenance upgrades, as necessary. The existing network of roads would be utilized, where feasible, as maintenance roads to objectives. These maintenance roads would be maintained with a non-vegetative stabilization method to prevent soil erosion.

The primary use of the CLF Range, however, would be for ground gunnery. During operations, prior to CLF Range training, units would assemble in the ROCA parking area. No additional assembly area would be constructed. CLF Range use may also involve aerial/helicopter training. Target pits constructed for the CLF Range would be to aerial gunnery standards which involves an increased wall height of 8 inches. No new flight routes, however, would be required for CLF Range access.



Source: ESRI, 2010; U.S. Department of Agriculture, 2011; Yakima Training Center, 2011. Created by PHE, October 2012.

Figure 2-1. Location and Components of the Proposed Action Alternative

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3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 Impact Assessment Methodology

3.1.1 INTRODUCTION AND DESCRIPTION OF BASELINE DATA AND SOURCES

The following types of data were used to characterize the affected environment of the preferred site:

- Geographical Information System, including utilities, infrastructure, hydrology, sensitive species, and wildland fire history.
- Detailed vegetation data obtained from JBLM YTC.
- Aerial photography: 2011, U.S. Department of Agriculture (USDA), National Agriculture Imagery Program.
- Regional and local reports: including Natural Resources Conservation Service Soil Surveys.
- Previous NEPA documentation.
- JBLM YTC management plans including the CNRMPs and the IWFMP.

3.1.2 APPROACH FOR ANALYZING IMPACTS

Context and intensity are taken into consideration in determining a potential impact's significance, as defined in 40 CFR Part 1508.27. The intensity of a potential impact refers to the impact's severity and includes consideration of beneficial and adverse impacts, the level of controversy associated with a project's impacts on human health, whether the action establishes a precedent for future actions with significant effects, the level of uncertainty about project impacts, or whether the action threatens to violate Federal, state, or local law requirements imposed for protection of the environment. The severity of environmental impacts are characterized as negligible, minor, moderate, major or beneficial:

- **None/Negligible** – No measurable impacts are expected to occur. A negligible impact may locally alter the resource, but would not measurably change its function or character.
- **Minor** – A minor impact would either be isolated and localized or not measurable on a wider scale.
- **Moderate** – Moderate impacts to a resource would be measurable on a wide scale (e.g., across the entire Installation or region). If moderate impacts are adverse, they would not exceed limits of applicable local, state, or Federal regulations.
- **Major** – A major impact may exceed limits of applicable local, state, or Federal regulations or would untenably alter the function or character of the resource. The threshold of significance would be a major (significant) impact. These impacts would be considered significant unless mitigable to a less-than-significant level.
- **Beneficial** – Impacts would benefit the resource/issue.

Impacts that range from none to moderate are considered insignificant. Significant adverse impacts would result from those impacts categorized as major.

To maintain a consistent evaluation of impacts in the EA and in accordance with the Army NEPA Regulations, significance thresholds were used for each resource (see Table 3.1-1). Although some thresholds have been designated based on legal or regulatory limits or requirements, others reflect discretionary judgment on the part of the Army in accomplishing its primary mission of military readiness, while also fulfilling their conservation stewardship responsibilities.

Quantitative and qualitative analyses have been used, as appropriate, in determining whether, and the extent to which, a threshold would be exceeded. Based on the results of these analyses, this EA identifies whether a particular potential impact would be adverse or beneficial, and to what extent.

A region of influence (ROI) was determined for each resource area and was based on the potential impacts to the affected resource. The ROI was generally limited to the specific preferred site (Range 15 of TA 12) for the following Valued Environmental Components (VECs): biological resources, wetlands, soils, land use and hazardous and solid wastes as these VECs are directly connected to specific existing conditions at the site and proposed uses at the site. For the remaining VECs, the ROI was generally expanded to include larger geographic areas (e.g., airsheds for air quality and watersheds for surface waters).

3.1.3 LEVEL OF VEC ANALYSIS

In compliance with the NEPA and CEQ regulations, the description of the affected environment focuses on those resources and conditions potentially subject to effects from implementing the Proposed Action. CEQ Regulations encourages NEPA analyses to be as concise and focused as possible. This is in accordance with CEQ Regulations at 40 CFR Part 1500.1(b) and 1500.4(b): "…NEPA documents must concentrate on the issues that are truly significant to the action in question, rather than amassing needless detail….prepare analytic rather than encyclopedic analyses."

Table 3.1-1 presents each VEC and corresponding ROIs and thresholds of significance. The table also identifies those VECs that are dismissed from further analysis or are fully analyzed in this EA, and the rationale for dismissing or analyzing each VEC. In conducting this analysis, a qualified Subject Matter Expert (SME) reviewed the potential direct and indirect effects of the Proposed Action and the No Action Alternative relative to each VEC. The SME carefully analyzed and considered the existing conditions of each VEC within the Proposed Action's ROI. Through this analysis, it was determined that, for several VECs, negligible adverse effects would occur.

Table 3.1-1. VEC Assessment Criteria and Level of Assessment

VEC	ROI	Thresholds of Significance	Dismissed from further Analysis?	Rationale for Level of Assessment
Air Quality and Greenhouse Gas (GHG)	Airshed Quality Control Region 230 and Installation boundary.	An impact to air quality would be considered significant if it affects the achievement or maintenance of National Ambient Air Quality Standards (NAAQS).	No	As the proposed CLF Range would result in an increase of emissions during construction and operations, the Proposed Action has the potential to adversely affect regional air quality concentrations and attainment status related to NAAQS. As a result, this resource area is further discussed in Section 3.2.
Water Resources (including surface waters and wetlands)	Watersheds, U.S. Army Corps of Engineers (USACE) jurisdictional "waters of the U.S.," or state-designated stream segment associated with Range 15 of TA 12.	Impacts on surface water would be considered significant if the action resulted in applicable Federal and state regulatory limits for surface water quality to be exceeded or resulted in unpermitted direct impacts to waters of the U.S.	No (surface waters) Yes (wetlands)	As Selah Creek and intermittent upland tributary drainages to Selah Creek are located within the vicinity of the Proposed Action, the potential exists for adverse impacts to surface water quality. As a result, this resource area is further discussed in Section 3.3. No wetlands occur within the Proposed Action construction disturbance footprint. The closest wetlands would be associated with riparian areas of Selah Creek located outside (over 1,000 feet to the south) of the Proposed Action construction disturbance footprints. Although the CLF return route would cross Selah Creek and riparian areas, an existing improved route that is already used for this purpose in support of the existing Range 15 would be used, thus avoiding any new impacts during operational use of the CLF Range. In addition, the potential power feed that would also cross Selah Creek and riparian areas would be placed through the existing utility sleeves installed in the existing culverted crossings of Selah Creek, avoiding impacts.

Table 3.1-1. VEC Assessment Criteria and Level of Assessment

VEC	ROI	Thresholds of Significance	Dismissed from further Analysis?	Rationale for Level of Assessment
Biological Resources (including vegetation, wildlife and aquatic life, and sensitive species)	Generally, biological resources within Range 15 of TA 12 (see Section 3.4 regarding habitats of specific protected species).	Impacts to biological resources would be considered significant if Army actions resulted in: • Long-term loss or degradation or loss of diversity within unique (e.g., Sage Grouse Protection Area) or high-quality (e.g., riparian) plant communities; • Unpermitted "take" of Federally-listed species; • Extirpation of rare or sensitive species not currently listed under the Endangered Species Act of 1973 (ESA); • Unacceptable loss of critical habitat as determined by the U.S. Fish and Wildlife Service (USFWS); • Non-compliance with policies, regulations, and permits related to wetlands conservation and protection; or • High probability of increasing the frequency and intensity of wildland fires, especially in sensitive ecological areas.	No	As the proposed CLF Range would result in adverse impacts to biological resources from construction and operations, the Proposed Action has the potential to exceed the thresholds of significance established for biological resources. As a result, this resource area is further discussed in Section 3.4.
Cultural Resources	Cultural Resources within Range 15 of TA 12.	Impacts to cultural resources would be considered significant if Army actions: • Permanently restricted access of tribal members to traditional cultural places; • Appreciably increased safety risks to tribal members using traditional cultural properties; • Resulted in a long-term loss or degradation of plant or animal populations of traditional cultural importance to Native Americans; or • Diminished the integrity of a historic property or archaeological site such that it was no longer eligible for listing in the National Register of Historic Places (NRHP).	No	As the proposed CLF Range would involve ground-disturbing activities, the Proposed Action has the potential to exceed thresholds of significance established for cultural resources. As a result, this resource area is further discussed in Section 3.5.

Table 3.1-1. VEC Assessment Criteria and Level of Assessment

VEC	ROI	Thresholds of Significance	Dismissed from further Analysis?	Rationale for Level of Assessment
Soil Resources	Soils within Range 15 of TA 12.	Impacts on geology, topography, and soils would be considered significant if: • The landscape cannot be sustained for military training, • Excessive soil loss impairs plant growth, or • Federal, state, or local laws pertaining to this resource are violated.	No	As the proposed CLF Range would involve ground-disturbing activities that could result in bare/exposed soils, the Proposed Action has the potential to exceed thresholds of significance established for soil resources. As a result, this resource area is further discussed in Section 3.6.
Land Use	Land use within Range 15 of TA 12.	Impacts to land use would be considered significant if the land use is incompatible with existing military land uses and land use designations, or has major conflicts with Army land use plans, policies, or regulations.	Yes	JBLM YTC is divided into five land use zones, which identify allowable military training activities and acceptable levels of impact to resources, thereby maximizing military training opportunities while simultaneously safeguarding resources. Land use and management activities are undertaken within the context of the zone designation. The proposed CLF Range is located in Zone 3 (General Use), which includes the Cantonment Area and the primary training and vehicle maneuver areas. The proposed CLF Range would be sited so that existing land use designations (i.e., SDZs) on Range 15 would accommodate the land use requirements required to support weapon systems used during CLF training. Construction and operation of the new range would reduce the total maneuver land available on the Installation; however, this use would be compatible with the area's existing training land use designation and reduction of total maneuver land would be mitigated through Range Operations training scheduling and continued shared use of Range 15. Furthermore, no existing land use constraints are in place that would reduce the availability or use of the new facility (e.g., seasonal and spatial constraints such as bald eagle areas along Columbia River and Hanson Creek, and sage grouse protection areas). Construction and operation of the range would have negligible impacts on adjacent land uses (all military training) and the overall land use at JBLM YTC. Therefore, no further analysis is required.

Table 3.1-1. VEC Assessment Criteria and Level of Assessment

VEC	ROI	Thresholds of Significance	Dismissed from further Analysis?	Rationale for Level of Assessment
Infra-structure and Utilities	Utilities within Range 15 of TA 12 and JBLM YTC.	Impacts to infrastructure and utilities would be significant if the action affected the ability to meet the overall training mission.	Yes	Infrastructure requirements for the Proposed Action would be minimal and are discussed in Section 2.4.2.1. The CLF Range would not require sewer hook-up or running water, and electricity would be supplied by generator or by connecting into the existing electrical grid, as described in Section 2.4.2.1. No connections would be required to the main JBLM YTC fiber optic system; a separate fiber optic system would run from the proposed ROCA to targetry, via fiber optic cables buried beneath or alongside existing roads. Construction and use of new roads required to support operation of the range would be minimal and would not result in significant long-term maintenance. Existing hardened roads would be utilized as the primary access and service roads. The CLF Range would represent an addition of structures that provide training opportunities and would result in a moderate beneficial impact to the training infrastructure at JBLM YTC. Infrastructure requirements are not anticipated to adversely impact the Installation's overall training mission; therefore, additional analysis is not required.

Table 3.1-1. VEC Assessment Criteria and Level of Assessment

VEC	ROI	Thresholds of Significance	Dismissed from further Analysis?	Rationale for Level of Assessment
Solid and Hazardous Waste	Range 15 of TA 12.	Impacts to solid and hazardous waste would be considered significant if the action causes considerable risk to human health or safety attributable to Army actions, including direct human exposure, substantial increase in environmental contamination or violation of applicable Federal, state, DoD, and local regulations.	Yes	Generation of solid and hazardous waste is not expected to increase as a result of the Proposed Action. Accidental spills of petroleum, oil, and lubricants could occur during construction or operations; however, such spills would be infrequent and unlikely and would be managed in accordance with the Installation Spill Contingency Plan and the *Training Unit Standard Operating Procedure*. The CLF Range would be located within an existing SDZ used for live-fire training; therefore, the potential for lead-contaminated soils or materials (e.g., berms) would exist on the site from previous and current live-fire training activities. All disturbed soils and materials would be reused on-site in the construction of the CLF Range targetry, and as a result, no impacts would be anticipated regarding off-site disposal of contaminated soils during construction. During operations, lead fragments from spent ammunition would continue to accumulate, over time, in the soil on the CLF Range. The Army has identified a broad number of engineering solutions and BMPs that can be incorporated into operating procedures to mitigate this issue and control the potential effects of lead and other metals from migrating into surface waters or wetlands areas. Those engineering solutions and BMPs are identified and discussed in detail in Army Small Arms Training Range Environmental Best Management Practices (BMPs) Manual (Fabian, 2005), and Prevention of Lead Migration and Erosion from Small Arms Ranges (U.S. Army Environmental Center, 1998). Additionally, it is likely that less toxic bullets would be used in the future due to the Green Ammunition Program initiated by the DoD to reduce and potentially eliminate the use of hazardous materials in small-, medium-, and large-caliber ammunitions. As the site is currently used for live-fire training, including CLF, impacts from munitions constituents would not represent a significant change in existing conditions at the range.

Table 3.1-1. VEC Assessment Criteria and Level of Assessment

VEC	ROI	Thresholds of Significance	Dismissed from further Analysis?	Rationale for Level of Assessment
				Solid waste generated from the Proposed Action would include construction debris and negligible amounts of solid waste from operations. All solid wastes generated during construction, demolition, operation, and maintenance would be properly managed in accordance with waste management policies at JBLM YTC. As this type of training activity already occurs at JBLM YTC no appreciable increase of waste is anticipated during training operations. Because there would be no appreciable change in solid and hazardous waste generation, and because this area has historically been subject to military uses, there would be no change in environmental impacts related to solid and hazardous wastes; therefore, no further analysis is required.
Noise	Areas adjacent to and within Range 15 of TA 12.	Impacts would be considered significant if noise from Army actions caused harm or injury to on- or off-site communities; or exceeded applicable environmental noise limit guidelines.	Yes	The dominant source of noise at JBLM YTC and immediately adjacent lands is from military training operations, including weapon fire (i.e., small and large arms), demolition/explosive-type noise, aircraft, and ground vehicles. The range location is such that no known receptors are within the Zone I or II contours for the weapon systems that would be used by units training on the new CLF Range. Additionally, noise associated with the construction and operation of a CLF Range would remain at or near current levels. Sources of noise associated with the action for construction would be limited to the types and levels consistent with current operations and maintenance activities. Noise associated with ongoing operation and maintenance would remain consistent with current land use activities for the affected areas. Therefore, noise will not be analyzed further for this action.
Wildland Fire	Areas adjacent to and within JBLM YTC.	The threshold for significance for wildland fire management is based on the potential of the action to increase wildland fire risk or adversely impact the ability of JBLM YTC to manage wildland fires.	No	As the proposed CLF Range would increase the potential of wildland fire starts, the Proposed Action has the potential to exceed thresholds of significance established for wildland fire. As a result, this resource area is further discussed in Section 3.7.

Table 3.1-1. VEC Assessment Criteria and Level of Assessment

VEC	ROI	Thresholds of Significance	Dismissed from further Analysis?	Rationale for Level of Assessment
Socio-economics	Socioeconomic factors within JBLM YTC, and immediate surrounding communities and counties.	Socioeconomic impacts would be considered significant if they caused substantial change to the sales volume, income, employment or population of the surrounding ROI.	Yes	Short-term negligible beneficial economic impacts would occur as a result of a temporary increase in construction workers hired and the local purchasing of construction materials. Long-term negligible economic benefits could occur due to potential contractual support needs for operation and maintenance of the range. The Proposed Action would not significantly impact sales volume, income, employment, or the local tax base. Additionally, because the Proposed Action would occur entirely on current JBLM YTC lands, no impacts to public services (e.g., fire protection, police enforcement, education, etc.), or low income, minority, or children populations would occur. Overall impacts to Socioeconomics and Environmental Justice would be negligible and further analysis has been dismissed from this EA.

3.1.4 CUMULATIVE EFFECTS

CEQ Regulations implementing NEPA defines a "cumulative impact" as follows:

Cumulative impact is the impact on the environment, which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7).

U.S. Environmental Protection Agency (USEPA) guidance to reviewers of cumulative impacts analyses further adds:

…the concept of cumulative impacts takes into account all disturbances since cumulative impacts result in the compounding of the effects of all actions over time. Thus, the cumulative impacts of an action can be viewed as the total effects on a resource, ecosystem, or human community of that action and all other activities affecting that resource no matter what entity (Federal, non-Federal or private) is taking the action (USEPA, 1999).

For the purposes of this EA, cumulative impacts result from the incremental impacts of the action when added to other past, present, and reasonably foreseeable actions regardless of who undertakes such actions. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time. For the purposes of the cumulative impacts analysis, the Proposed Action's ROI is limited to JBLM YTC and adjacent lands (including communities around the Installation). This ROI includes areas where the Proposed Action's effects would most likely contribute to cumulative environmental effects.

The Army considered a wide range of past, present, and reasonably foreseeable future actions in the ROI that could contribute to cumulative environmental effects. The Army considered other past, present, or foreseeable future actions regardless of whether the actions are similar in nature to the Proposed Action or outside the jurisdiction of the Army.

Cumulative effects are addressed within each resource section following the discussion of environmental consequences for each alternative. This analytical approach provides a more complete understanding of resource conditions that implementation of the Proposed Action might magnify, amplify, or otherwise exacerbate or cause beneficial or adverse effects (i.e., synergistic or countervailing effects; CEQ, 1997) to resources on a regional or temporal scale. Table 3.1-2 lists the past, present, and reasonably foreseeable Army actions, and other actions within the ROI, that were reviewed in conducting the cumulative effects analysis. The information in this table represents a review of credible online sources, local planning documents, and communication with the local planning agencies having responsibility for, or jurisdiction over, lands or projects within the ROI. Only those projects that were determined to be reasonably foreseeable have been included in Table 3.1-2 for consideration in the cumulative impact analysis. "Reasonably foreseeable" is defined as those projects that are well-developed, in mature planning stages, and/or have funding secured. Conceptual projects, broad goals, objectives, or ideas listed in planning documents that do not meet the above criteria are not considered reasonably foreseeable for the purposes of this analysis.

Table 3.1-2. Past, Present, and Reasonably Foreseeable Actions within the ROI

Potentially Contributing Project or Activity	Description of Activity	Time Frame	
		2011-2013	2013-2018
17th Fires Brigade Firebases	JBLM YTC proposes to construct up to two firebases to support advanced and realistic training in artillery live-fire tasks and base operations. Each firebase would consist of a 200-meter by 200-meter area surrounded by a defense perimeter. Ten-foot tall guard towers would be located at each corner of the fire base and at the base entry. The area within each fire base would be hardened with gravel and contain two circular firing positions for M777 lightweight 155 millimeter howitzer guns. Two sites are being considered; one fire base would be constructed in TA 16 and a second fire base would be constructed in TA 6.	x	
Multi-Purpose Machine Gun Range (MPMGR)	The project includes construction of a MPMGR on/over the existing Range 5. The project includes a standard MPMGR, one range operations tower, one operations/control building, one classroom building, one vault latrine, one bleacher enclosure, one ammunition breakdown building, and tactical/organizational vehicle parking. The standard design range with its associated ROCA will be adapted to fit the proposed previously disturbed site.		x
Pacific Power Powerline Project: Vantage to Pomona heights	Pacific Power is planning a new 230-kilovolt transmission line that would enhance the overall operating flexibility and security of the regional transmission grid and improve system reliability in the Yakima Valley. The new line would connect the existing Bonneville Power Administration substation near Vantage and Pacific Power's Pomona Heights substation near Selah, a distance of approximately 60 miles. The project is currently being evaluated in an EIS, which includes alternatives within JBLM YTC or directly adjacent to JBLM YTC; including an alternative along the southwest edge of JBLM YTC in Yakima County near Kittitas Canyon and the Pomona Heights Substation, and an alternative along abandoned railroad right-of-way on the west side of the Columbia River, directly adjacent to JBLM YTC.	x	

Table 3.1-2. Past, Present, and Reasonably Foreseeable Actions within the ROI

Potentially Contributing Project or Activity	Description of Activity	Time Frame	
		2011-2013	2013-2018
Realignment, Growth, and Stationing of Army Aviation Assets at JBLM	The Realignment, Growth, and Stationing of Army Aviation Assets decision has several components that consist of stationing up to 2,700 Soldiers and up to 120 helicopters at JBLM to implement GTA stationing decisions, and the stationing of a Combat Aviation Brigade (CAB). These additional Soldiers and units stationed at JBLM as part of this decision would also train at JBLM YTC.	x	x
Vantage Wind Power Project	Construct a wind farm with a maximum of 69 wind turbines located on 4,750 acres, maximum height of 389 feet. The proposed project is located north of Interstate 90 and south of Vantage Highway between Kittitas and Vantage, 7 miles west of the Columbia River, southeast of the Wild Horse Wind Power Project.	x	
Washington Army National Guard (WAARNG) Tactical Unmanned Aerial System (TUAS) Training Facility	The WAARNG proposes to enter into a 25-year real property agreement with the DA via the USACE-Seattle District, for use of an area of land at JBLM YTC to construct a TUAS facility. Two sites are being considered in proximity to the Selah Airstrip; the North Selah Airstrip and the South Selah Airstrip. Both sites include the construction of an approximately 8-acre National Guard Facility for UAS training, administrative activities, and operations and maintenance.	x	
JBML YTC Range Development Project – JBLM YTC Urban Operations Village (UOV)	The Army completed an UOV facility at JBLM YTC in the eastern portion of TA 2 to support advanced and realistic urban operations training. The proposed complex is located on the north side of North Doris Road with a footprint of 400 feet by 400 feet.	x	
JBLM YTC Range Development Project – Sniper Field Fire (SFF) Range	A SFF range is being constructed between Ranges 4 and 5 in TA11. Construction includes a standard SFF Range, an instruction/operations building, latrine, bleacher enclosure, ammo breakdown building, covered mess, and control tower. Two target maintenance roads will be incorporated with the existing road network.	x	

Table 3.1-2. Past, Present, and Reasonably Foreseeable Actions within the ROI

Potentially Contributing Project or Activity	Description of Activity	Time Frame	
		2011-2013	2013-2018
JBLM YTC Range Development Project – Combined Arms Collective Training Facility (CACTF)	This action would involve the potential construction of a CACTF in central or southwestern areas of JBLM YTC. A CACTF supports multi-echelon, full spectrum operations MOUT (military operations on urbanized terrain) training up to battalion task force level. It is designed to support heavy and light infantry, armor, artillery, and aviation positioning and maneuver. The CACTF replicates an urban environment, and consists of approximately 2.25 square kilometers of urban sprawl with 20 to 26 buildings, roads, alleys, parking areas, underground sewers, parks, athletic fields, and a command and control building.		x
Yakima Basin Integrated Water Resource Management Plan	This activity involves implementation of the Yakima Basin Integrated Water Resource Management Plan and its seven elements: reservoir fish passage, structural and operational changes to existing facilities, surface water storage, groundwater storage, habitat/watershed protection and enhancement, enhanced water conservation, and market reallocation. The Integrated Plan was developed using a comprehensive approach to address a variety of water resource and ecosystem problems affecting fish passage, fish habitat, and water supplies for agriculture, municipalities, and domestic uses.	x	x

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3.2 Air Quality and GHG

3.2.1 AFFECTED ENVIRONMENT

3.2.1.1 National Ambient Air Quality Standards and Attainment Status

The USEPA Region 10 and the Washington Department of Ecology (WDOE) Air Division regulate air quality in Washington. The Clean Air Act (CAA) (42 USC 7401-7671q), as amended, gives USEPA the responsibility to establish the primary and secondary NAAQS (40 CFR 50) that set acceptable concentration levels for seven criteria pollutants: fine particulate matter of diameter 10 micrometers or less (PM_{10}), very fine particulate matter of diameter 2.5 micrometers or less ($PM_{2.5}$), sulfur dioxide (SO_2), carbon monoxide (CO), nitrogen oxides (NO_x), ozone (O_3), and lead. Short-term standards (1-, 8-, and 24-hour periods) have been established for pollutants that contribute to acute health effects, while long-term standards (annual averages) have been established for pollutants that contribute to chronic health effects. Additionally, the CAA, as amended in 1990, places most of the responsibility to achieve compliance with NAAQS on individual states. In Washington, the WDOE is responsible for most statewide air quality rules but local clean air agencies govern air quality regulations in assigned jurisdictions. JBLM YTC is located within the jurisdiction of both the Yakima Regional Clean Air Agency (YRCAA) and the WDOE Central Regional Office.

Federal regulations designate Air Quality Control Regions (AQCRs) that are in violation of the NAAQS as nonattainment areas and those in accordance with the NAAQS as attainment areas. Maintenance areas are attainment areas that were formerly designated nonattainment, and have implemented plans to maintain their attainment status. The General Conformity Rule (40 CFR Part 51, Subpart W, and 40 CFR Part 93) ensures that the actions taken by Federal agencies in nonattainment and maintenance areas do not impede the state's ability to achieve the NAAQS in a timely fashion.

JBLM YTC is in the South Central Washington Intrastate AQCR 230 (40 CFR 81.189). Per the USEPA Green Book, Kittitas County is in attainment for all criteria pollutants, while Yakima County is designated as a maintenance area for PM_{10} (USEPA, 2012a). Yakima County was formerly designated as a maintenance area for CO but as of January 2012 is out of the maintenance plan for CO (Coons, 2011).

Since air quality is measured and regulated on a regional level, the ROI for the air quality analysis in this EA is AQCR 230, which includes those portions of Washington where the Proposed Action would occur. The WDOE monitors levels of criteria pollutants at approximately 60 representative sites throughout Washington and has monitoring stations in Yakima and Kittitas counties (WDOE, 2012). Since the monitoring stations in Yakima County and Kittitas County only measure $PM_{2.5}$ and PM_{10}, the closest stations measuring the highest value of the other criteria pollutant parameters were used to reflect the regional air quality. Table 3.2-1 includes the monitored concentrations of CO, SO_2, PM_{10}, and $PM_{2.5}$ for 2008, 2009, and 2010.

Table 3.2-1. Air Quality Standards and Ambient Air Concentrations AQCR 230

Pollutant				Federal Standards[1]	
	2008	2009	2010	Primary[2]	Secondary[3]
CO (parts per million - ppm)[10] 1-hour	4	4	1	35[4]	None
8-hour	2	3	1	9[4]	None
O_3 (ppm)[11] 8-hour	0.075	0.076	0.068	0.075[5]	Same as Primary Standard
PM_{10} (micrograms per cubic meter - $\mu g/m^3$)[12] 24-hour	55	53	38	150[6]	Same as Primary Standard
$PM_{2.5}$ ($\mu g/m^3$)[13] 24-hour	37	39	35	35[7]	Same as Primary Standard
Annual Arithmetic Mean	14.5	10.5	8.5	15[8]	
SO_2 (ppm)[14] 1-hour	0.032	0.028	0.025	0.075[9]	0.5
24-hour	0.011	0.008	0.009	0.14[4]	None

Note: The availability of data from monitoring stations in Yakima is limited to PM data; therefore, the closest monitoring stations upwind from the JBLM YTC were used to represent ambient air concentrations. Additionally, annual statistics for 2011 are not final until May 2012, so 2010 was the most current year reviewed.

1. National averages (other than O_3, PM, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The O_3 standard is attained when the expected number of days per calendar year, with a maximum hourly average concentration above the standard, is equal to or less than one.
2. National Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.
3. National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects from a pollutant.
4. Not to be exceeded more than once per year.
5. The 3-year average of the annual fourth highest daily maximum 8-hour average must not exceed the primary Federal standard.
6. Not to be exceeded more than once per year on an average over 3 years.
7. The 3-year average of the 98th percentile of 24-hour concentrations must not exceed the primary Federal standard.
8. The 3-year average of the weighted annual mean $PM_{2.5}$ concentrations from single or multiple community-oriented monitors must not exceed the primary Federal standard.
9. The 3-year average of the 99th percentile of the daily maximum 1-hour average must not exceed the primary Federal standard.
10. CO data for 2008 and 2009 is from a monitoring station located in Bellevue and 2010 data is from a station in Seattle.
11. O_3 data is from a monitoring station located in Enumclaw.
12. PM_{10} data is from a monitoring station located in Yakima.
13. $PM_{2.5}$ data is from a monitoring station located in Yakima.
14. SO_2 data is from a monitoring station located in Seattle.

Sources: USEPA, 2012b; 40 CFR Part 50; 73 Federal Register 16436-16514.

3.2.1.2 Regional and Installation-Wide Emissions

Stationary and non-stationary sources contribute to existing emissions at JBLM YTC. The largest stationary source of air pollution at JBLM YTC is fuel-burning equipment, including generators and boilers which emit PM_{10}, SO_2, lead, CO, NO_x, and volatile organic compounds (VOCs). The facility operates five boilers, three of which were decommissioned in June 2009 and replaced with smaller, more fuel-efficient natural gas space heater/furnaces, resulting in lower emissions. Additional sources of emissions include painting operations, a wastewater treatment plant, fuel storage, degreasing operations,

and vehicle maintenance. Mobile or non-stationary sources of pollution such as motorized vehicles (i.e., cars, trucks, and other motor vehicles) contribute to the emission of CO, NO_x, and PM. Smoke generators (i.e., smoke grenades and artillery shells) may be used to create fog oil and graphite smoke to obscure troops during training activities. Such smoke and munitions emit several hazardous air pollutants including zinc chloride, phosphoric acid, and hydrogen chloride (U.S. Army, 2010). Table 3.2-2 summarizes the 2011 air emissions inventory from registered sources at JBLM YTC.

Table 3.2-2. 2011 Annual Emissions at JBLM YTC

Pollutant	Emissions (tons per year [tpy])
PM_{10}	0.39
$PM_{2.5}$	-
NO_x	5.63
SO_x	0.47
CO	1.20
VOCs	0.54
CO_2e[1]	2400[2]
Total HAPs	0.04

Note: $PM_{2.5}$ data was unavailable.
[1] CO_2 equivalents (CO_2e) are the amount of CO2 by weight emitted into the atmosphere that would produce the same estimated radiative forcing as a given weight of another radiatively active gas. CO2e are computed by multiplying the weight of the gas being measured (for example, methane) by its estimated global warming potential (which is 21 for methane).
[2]Source for CO_2e: USEPA, 2011.
Source: JBLM YTC, 2011.

3.2.1.3 Permitting Requirements

JBLM YTC is registered with YRCAA as a Complex Minor Source of air emissions (U.S. Army, 2011). The Installation does not generate sufficient air contaminants to require an air quality permit (Title V) but performs standard annual emissions reporting (U.S. Army, 2010).

3.2.1.4 Climate and GHGs

The average climate at the JBLM YTC is relatively mild and dry. It is modified by the complex topography of the Cascade Mountains to the west and the Rocky Mountains to the east. Summers are typically dry and hot, with July being the driest and warmest month. On average, July accumulates the least amount of monthly rain (0.19 inches) and the highest average maximum temperatures (87.5 degrees Fahrenheit [˚F]). The region experiences large diurnal temperature variation. With maximum temperatures in the upper 80s and minimum temperatures in the low 50s, diurnal temperature variations in June and July average to approximately 34˚F. Winter temperatures are cold and diurnal temperature variations are less extreme (approximately 17˚F). Minimum temperatures average 20.9˚F in January. Precipitation occurs mostly in the late fall and early winter but since the JBLM YTC lies in the rain shadow of the Cascade Mountains, it is sheltered from large accumulations. Average annual precipitation totals to 8.2 inches and December accounts for the highest average monthly precipitation of 1.34 inches. Occasional light snowfall contributes to average snow depth of 3 inches in January (WRCC, 2011).

GHGs are components of the atmosphere that trap heat relatively near the surface of the earth, and therefore, contribute to the greenhouse effect and global warming. Most GHGs occur naturally in the atmosphere, but increases in their concentration result from human activities such as the burning of fossil fuels. Global temperatures are expected to continue to rise as human activities continue to add carbon dioxide (CO_2), methane, NO_x, and other greenhouse (or heat-trapping) gases to the atmosphere. Federal agencies, states, and local communities address global warming by preparing GHG inventories and adopting policies that would result in a decrease of GHG emissions. Executive Order (EO) 13514, *Federal Leadership in Environmental, Energy, and Economic Performance*, establishes deadlines critical to achieving GHG reduction goals for Federal agencies. The draft guidance includes a presumptive effects threshold of 25,000 metric tons of CO_2 equivalent emissions from an action (CEQ, 2010).

3.2.2 ENVIRONMENTAL CONSEQUENCES

3.2.2.1 No Action Alternative

Selecting the No Action Alternative would result in no impact to air quality and GHGs from existing baseline conditions. No construction would be undertaken, and JBLM YTC would continue to utilize temporary ranges for CLF training. Since no new CLF Range would be established, ambient air quality conditions would remain unchanged when compared to existing conditions.

3.2.2.2 Proposed Action Alternative

Impacts to air quality would be considered significant if the Proposed Action would increase the ambient air concentrations above NAAQS or interfere with the attainment status of NAAQS. The General Conformity Rule requires a review of actions taken by Federal agencies that may affect the air quality in nonattainment and maintenance areas. Yakima County is in a maintenance area for PM_{10} but the maintenance area is confined to an approximately 80 square mile area encompassing the City of Yakima (USEPA, 2012c). The location of the Proposed Action lies to the east and does not fall within the designated maintenance area; therefore, does not require General Conformity Rule analysis. Additionally, prevailing winds flow from the west-northwest (towards the east-southeast), which reduces the likelihood of potential air pollutants from JBLM YTC to transport to the designated maintenance area to the west.

Construction

Overall adverse impacts from range construction would be localized, minor, and temporary. The potential impacts on air quality from construction of the proposed CLF Range would be from PM (fugitive dust) and emissions from vehicle exhaust generated from earth-moving operations during range construction. Range construction activities that have the potential to cause fugitive dust includes construction of an approximately 800-square-foot building and parking area for the ROCA building, demolition of the existing Range 15 target pits, trenching for fiber optic and electric cables to connect the proposed ROCA with targetry, and trenching for the potential power feed to the new facility if generators are not used during operations.

Although construction could last approximately one year, the impacts of range construction would be localized, minor, and temporary. If construction involves the use of generators as a power source during construction or if rock crushers are utilized, the contractor would contact the YRCAA concerning possible submittal of a Notice of Establishment of Temporary Portable Sources and provide JBLM YTC Public Works-Environmental Division with a copy of the notice. In addition, the construction contractor would submit a dust control plan to the YRCAA and provide a copy to JBLM YTC Public Works-Environmental Division.

Operations

Overall impacts from range operations would be less than significant. Implementation of the Proposed Action would not increase the level of CLF training at JBLM YTC. Operational impacts on air quality would be similar to those from current CLF training, attributed to dust and exhaust vehicle emissions from Installation personnel travelling to and from the proposed CLF Range and from training activities using High-Mobility Multipurpose Wheeled Vehicles to traverse the proposed CLF Range. Wildland fires are a potential consequence of CLF training that would have an impact on air quality. Although smoke composition depends on multiple factors, including fuel type and moisture content, the smoke from wildland fires generally includes PM, CO_2, CO, VOCs, and water vapor (CDPH, 2008). JBLM YTC has smoke management techniques and an IWFMP to meet regulatory and burn permit requirements. This includes practices such as only conducting prescribed burns on GREEN air quality days to ensure sufficient mixing and transport winds to disperse smoke away from populated areas (JBLM YTC, 2012).

In addition to smoke from wildland fires, pyrotechnics and tracer rounds can induce smoke and air quality contaminants. CLF training mostly involves small arms calibers (i.e., up to .50 CAL) but could include pyrotechnics and tracer rounds. JBLM YTC has established initiatives to reduce the likelihood of fire ignition including pyrotechnic restrictions during periods of high fire danger (JBLM YTC, 2012). Refer to Section 3.7, Wildland Fire, for additional information.

Power to operate the CLF facility would potentially be provided by either the electrical grid (part power) or two generators; a 60 kW generator for the ROCA and a 20 kW generator near the ECP. The type of generators supplied by the contractor for use would be subject to approval by JBLM YTC. Prior to installation, the contractor would supply a detailed generator inventory (make, model, serial number, fuel type, kW rating, engine horse power, air pollution control devices, etc.). The generators would be a new source of air emissions on JBLM YTC, mainly used when CLF training activities occur (up to 242 days per year). Based on the most recent Potential to Emit (PTE) values for JBLM YTC, the Installation is about 60 percent of the way to becoming a major source of emissions, which would require a Title V Permit. If diesel-fuel generators were installed as the facility power source, the Installation's PTE would approach the 100 tpy Title V Clean Air Act threshold for NO_x pollutant.

The CLF Range would increase GHG emissions if diesel powered non-emergency generators are used to provide power to the facility. EO 13514 compliance would require that other less pollutant generating sources such as the electrical grid or propane generators (non-diesel) be utilized as non-emergency power sources at the CLF Range in achieving GHG reduction goals.

Although operation of the CLF facility would cause vehicle emissions and potentially, instances of wildland fire, such impacts already occur during existing CLF training elsewhere within JBLM YTC and would not differ greatly from existing conditions. The Proposed Action would provide the JBLM YTC with a central training location that would allow for better management of impacts. Therefore, long-term impacts would be less than significant.

3.2.3 CUMULATIVE EFFECTS

Overall cumulative adverse impacts would be minor. The potential long term impact on air quality would be from operation of two generators, while short-term impacts to PM would occur from earth-moving construction activities, and emissions from construction vehicle exhaust. Effects of the generators would be reduced by using other options, such as a propane-fueled generator, a non-road generator engine, or the electrical grid to provide electrical power. Other projects at JBLM YTC could potentially be implemented concurrently with the Proposed Action include additional training capabilities (i.e., Urban Operations Village, Sniper Field Fire Range, Combined Arms Collective Training Facility, 17th Fires Brigade Firebases, MPMGR and WAARNG TUAS), and the stationing of additional Soldiers and units at JBLM and consequent increase training use at JBLM YTC. Increases in training would cause vehicle use and emissions to rise as analyzed previously in the *Fort Lewis Army Growth and Force Structure Realignment*

EIS, but construction of additional facilities would not have a cumulative effect with the Proposed Action. Construction of the proposed CLF Range and other reasonably foreseeable future actions would have short-term, temporary, and localized impacts but would not have a significant cumulative impact on regional air. Increases in training would cause vehicle use and emissions to rise, as analyzed previously in the *Fort Lewis Army Growth and Force Structure Realignment EIS*, however, the level of CLF training would not increase. The potential addition of generators would be a new emission source and could potentially cause a minor incremental increase in emissions from the up-tempo of training and related emissions at JBLM YTC.

3.2.4 PROPOSED IMPACT REDUCTION MEASURES

As discussed within this section, no significant impacts to air quality are anticipated. Impacts to air quality would be further reduced by BMPs. BMPs used during construction, such as a Dust Control Plan would minimize the production of PM (dust). Prior to construction, the contractor would contact the YRCAA to determine the requirements for a Dust Control Plan and appropriate dust control measures; if dust might pose a nuisance or be a detriment to health or safety, preventive measures would be outlined in the Dust Control Plan and implemented by the contractor to prevent airborne dust during construction. If temporary generators are used for construction, the contractor would contact the YRCAA concerning possible submittal of a Notice of Establishment of Temporary Portable Sources and provide JBLM YTC Public Works-Environmental Division with a copy of the notice. The control of smoke would be handled by smoke management techniques per the IWFMP to meet regulatory and burn permit requirements. This includes timing of prescribed fires and firebreak management to control smoke produced by wildland fire management. If the Proposed Action pursues the use of the two new generators to power the proposed CLF Range, JBLM YTC would coordinate with WDOE and YRCAA to determine potential permitting or regulatory requirements. To reduce potential impacts to air quality (NO_x) and GHG emissions, JBLM YTC would consider powering the facility using the electrical grid or fuel-efficient generators (i.e., propane-fueled or low-sulfur diesel generators).

3.3 Surface Waters

3.3.1 AFFECTED ENVIRONMENT

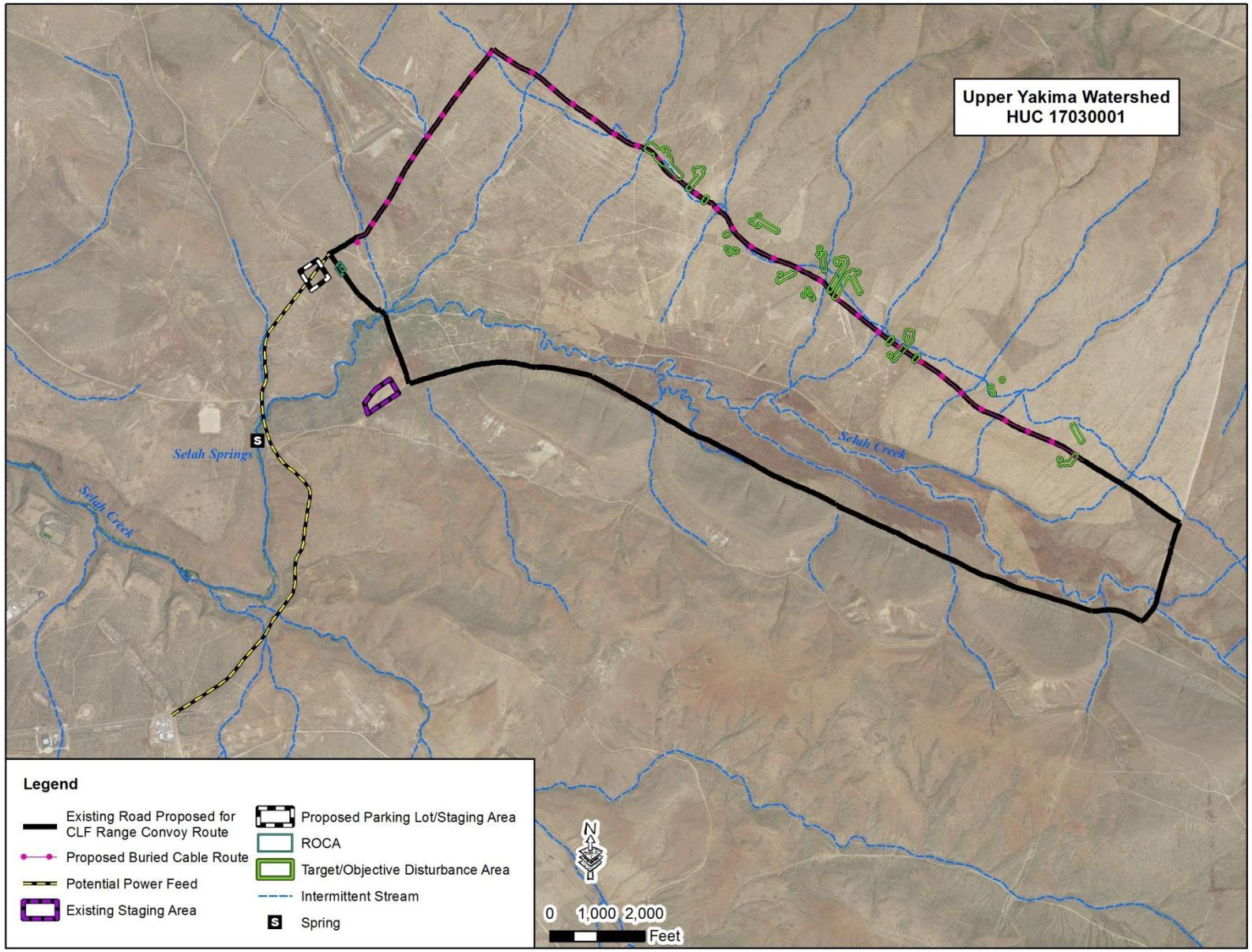
3.3.1.1 Surface Waters and Floodplains

Surface Waters

The Yakima and Columbia rivers border JBLM YTC to the west and east, respectively, and flow from north to south (Kurtz, 2010). Drainage of natural surface waters including streams and creeks on JBLM YTC are defined by a series of ridges and valleys; numerous small gullies dissect the valleys. Surface waters flow along these gullies from numerous springs into several streams, which eventually flow into the Yakima or Columbia River. Major streams on JBLM YTC predominantly flow to the west and discharge into the Yakima River, or to the east and discharge into the Columbia River.

JBLM YTC contains 17 major streams with intermittent or perennial stream flow and more than 200 springs, many of which have surface water flow. Streams on JBLM YTC are fed by direct precipitation runoff and in some cases by discharge of groundwater (springs and seeps). Due to the arid and semi-arid climate of the region and occasional high volume precipitation and snowmelt events, streams at JBLM YTC have high variation in flows (Kurtz, 2010). Surface water runoff on JBLM YTC is limited due to high evapotranspiration and low precipitation rates. There are several creeks with perennial reaches on the Installation (Alkali, Cold, Corral, Cottonwood Foster, Hanson, Johnson, Lmuma, No Name, Selah, Middle, Sourdough, and Washout), with flow typically occurring at least three months of the year. These creeks have protected riparian buffer zones with minimal impact from human activity.

The closest surface water to the Proposed Action is Selah Creek (see Figure 3.3-1). Selah Creek flows from east to west and drains directly to the Yakima River. Selah Creek displays both perennial and intermittent flow on JBLM YTC. Fish are present in downstream reaches of Selah Creek beyond the Installation boundary near Selah Creek's confluence with the Yakima River. The Proposed Action would be near an intermittent segment of Selah Creek. This segment primarily has water flowing for a brief period during the spring or immediately following a large precipitation event. Also, as shown on Figure 3.3-1, Selah Springs is located directly west (downstream) of the potential power feed line.



Source: U.S. Department of Agriculture, 2011; Yakima Training Center, 2011. Created by PHE, November 2012.

Figure 3.3-1. Existing Surface Water Features at the Proposed CLF Range

Figure 3.3-2 is a photograph of Selah Creek located west (downstream) of the proposed CLF Range return route taken in November, 2011. As shown in the photo, Selah Creek near the Proposed Action displays highly incised and erodible banks and is a dry channel.

Source: Field photograph taken by PHE, November 2011.

Figure 3.3-2. Selah Creek West of the Proposed Project

Additionally, according to the National Wild & Scenic Rivers database (http://rivers.gov/wildriverslist.html), no natural or scenic rivers exist within JBLM YTC.

Floodplains

Surface waters (such as streams and creeks) that are periodically subject to flooding during intervals of overbank flow create a relatively broad and flat valley area immediately adjacent to the waterbody known as a floodplain. Floodplain areas are divided into two types: 100-year floodplains and 500-year floodplains. The 100-year floodplain is regulated by the Federal Emergency Management Agency (FEMA) and is defined as typically dry land that has a 1 percent or greater chance of flooding each year; the 500-year floodplain is defined as land that has a 0.2 percent chance of a flooding each year (FEMA, 2010).

EO 11988, Floodplain Management, directs Federal agencies to avoid, to the extent possible, adverse impacts associated with the modification of floodplains and to avoid support of floodplain development when there is a practicable alternative. The EO specifies that, in situations where alternatives are impractical, the agency must minimize potential harm to or within the floodplain and take appropriate steps to notify the public. Although floodplains have been mapped and effective flood hazard data is available in Yakima County, there is no coverage on the JBLM YTC.

Floodplain review is achieved through the Clean Water Act (CWA) Section 401/404 permit process. Permit decisions are made by the USACE in conjunction with the involved state, in this case with

WDOE. Applicants for a Section 404 permit are required to obtain Section 401 Water Quality Certification from the WDOE.

Section 401 water quality certification also indicates that a project is consistent with the state's water quality standards. Short- and long-term impacts to water quality and water-related uses are evaluated in the Section 401 certification review. As part of the Section 404 permitting process per 33 CFR Part 320.4(l)(2) and 33 CFR Part 320.4(l)(3), USACE is to consider in its approval decision impacts associated with the modification of floodplains and avoid such impacts to the extent practicable.

3.3.1.2 Surface Water Quality

Water quality standards are issued by the WDOE, Water Quality Program and by the USEPA under the Federal Safe Drinking Water Act and the CWA. Section 303(d) of the CWA requires states to identify and develop a list of impaired waterbodies where technology-based and other required controls have not provided attainment of water quality standards. Section 305(b) of the CWA requires states to assess and report the quality of their waterbodies. The State of Washington has combined its 303(d) and 305(b) lists into one report referred to as the Integrated Report. This report displays the health of all waterbodies within the state. Although streams on JBLM YTC have not been classified by the State of Washington, they are considered to be Class A (excellent) by Washington State surface water quality standards for these respective stream types.

The WDOE has not designated any of the streams in the JBLM YTC as impaired. The Columbia River, and the Yakima River which Selah Creek is a tributary of, however, are listed as impaired for water quality (WDOE, 2011). The lower reach of the Yakima River is listed as impaired by pH, turbidity, ammonia, dissolved oxygen, and chlorine (WDOE, 2011). The Integrated Report identifies those waterbodies that are impaired and do not meet designated uses and establishes total maximum daily loads (TMDLs) for the pollutants of concern. The TMDL process establishes allowable pollutant loadings or parameters for a waterbody through a watershed management plan and allows water quality controls to be developed to reduce pollution and to restore and maintain water quality. The allowable load established by a TMDL suggests stream water quality would improve over time at such a level to maintain the stream's designated use. JBLM YTC has been identified as a source of elevated suspended sediment and turbidity in the Upper Yakima River basin (WDOE, 2003). Discharge of fine sediment is most likely following high, short-duration flow events, which typically involve rain falling on snow or frozen ground.

To manage sediments, JBLM YTC has developed programs to reduce and minimize discharge of sediment into its surface waters, and ultimately into receiving waters of both the Yakima and Columbia rivers. The program includes management of TAs to allow vegetation to recover, active revegetation by planting, construction of sediment trapping check dams at critical locations, erosion modeling, and protection of critical riparian vegetation corridors by restricting use of those areas. The existing management programs are consistent with the requirements for BMPs for compliance with the anti-degradation policy of the State of Washington (WAC 173–201A) for nonpoint sources of pollution, as required by Section 319 of the CWA (U.S. Army, 2011). In addition, since the mid-1990s, improvements in road structure, road closure and realignments, and channel crossings have been completed at JBLM YTC. Over 300 miles of existing roads have been resurfaced with crushed rock and 14 miles of roads were re-routed away from stream channels and areas with a high potential for erosion. In addition, almost 400 stream channel crossings have been improved with culverts and fords. Along with these improvements, riparian and upland restoration programs contribute to minimizing the quantity of fine sediment reaching JBLM YTC streams and subsequently transported to the Columbia and Yakima rivers (Kurtz, 2010).

3.3.1.3 Stormwater Management

Stormwater management systems provide the benefit of reducing amounts of sediments and other contaminants that would otherwise flow directly into surface waters. Nonpoint pollutant loading comprises a wide variety of sources not subject to point source control via National Pollution Discharge Elimination System (NPDES) permits. The most significant nonpoint sources are those associated with precipitation, runoff, and erosion, which may move pollutants from the land surface to waterbodies. JBLM YTC complies with the provisions of the CWA and Federal, state, and local regulations to manage stormwater, both of which are stipulated in Army Regulation (AR) 200-1, *Environmental Protection and Enhancement*, as well as NPDES rules and regulations. In addition, JBLM YTC must comply with Section 438 of the Energy Independence and Security Act of 2007, which addresses development or redevelopment of over 5,000 square feet.

JBLM YTC has a CSWPPP that meets necessary requirements and implements the basic Installation-wide CSWPPP for small and large construction activity at JBLM YTC. The CSWPPP provides protection by ensuring contracts contain language requiring site operators to obtain an NPDES permit and develop a site specific CSWPPP. Stormwater management is performed by training all personnel in identified areas in the use of BMPs to prevent rainwater runoff carrying oil and fuel from contaminating surface water resources. As the CSWPPP is a general overarching document, additional site specific BMPs may be used at times to prevent discharges at specific sites. Much of the Installation's water resources management is closely related to minimizing and repairing erosion caused primarily by military training activities, wildland fire, and to a lesser degree by construction projects.

3.3.2 ENVIRONMENTAL CONSEQUENCES

Impacts to water resources would be considered significant if they result in the exceedance of TMDLs causing a change in surface water impairment status, or result in unpermitted direct impacts to jurisdictional waters.

3.3.2.1 No Action Alternative

Under the No Action Alternative, there would be no new construction and training activities would remain consistent with present levels; therefore, no new direct or indirect impacts to water resources would occur.

3.3.2.2 Proposed Action Alternative

3.3.2.2.1 Impacts to Surface Waters and Floodplains

Construction

Overall adverse impacts from range construction would be short term and minor. The proposed CLF Range would utilize existing roads to the extent practical; no new surface water crossings (e.g., culverts and fords) are proposed which would avoid direct permanent impacts to surface waters or Selah Springs. In addition, the proposed ROCA, parking lot and targetry/objective footprints of disturbance are located away from surface water resources, avoiding direct impacts. Indirect impacts to surface water quality from construction are discussed in Section 3.3.2.2.2.

Installation of the proposed fiber optic and electric cables to targetry would involve 14 crossings of unnamed intermittent upland tributary drainages to Selah Creek. In addition, if generators are not used to supply electricity to the ROCA, installation of the power feed would involve 3 crossings of unnamed intermittent upland tributary drainages to Selah Creek and 1 crossing of Selah Creek. These activities would result in direct and temporary impacts to these surface waters. Crossing of unnamed intermittent upland tributary drainages would involve trenching and disturbance to the streambed. Impacts, however, would be temporary and minor with typical trenching efforts lasting 3 to 4 days. Following construction,

the streambeds would be restored to their original grades. Installation of these utilities underneath the intermittent upland tributary drainages could result in localized short-term direct minor adverse effects in the form of increased stream turbidity. The turbidity could occur during and after construction should water be present within these channels prior to successful completion of site revegetation efforts. The use of BMPs during construction (e.g., silt fences and wattles) could be used to minimize the transport of sediments during construction. Impacts to crossing of Selah Creek would be avoided as the proposed power feed would be placed through the existing utility sleeves installed in the existing culverted crossings of Selah Creek.

Operations

Overall adverse impacts from range operations would be negligible to minor. Normal operations of the CLF Range would generally not affect surface water resources. Convoy movements to the new range would utilize existing roads and water crossings (i.e., culverts and fords) on already established roads. Occasional maintenance may require access to buried portions of the fiber optic lines and the power feeds; however, BMPs, such as strategic placement of silt fencing and temporary drainage controls, would be used to avoid any indirect impacts (e.g. sedimentation and turbidity) to adjacent surface waters.

3.3.2.2.2 Impacts to Surface Water Quality

Construction

Overall adverse impacts from range construction would be temporary and minor. Initial construction activities would consist of clearing vegetation and leveling areas for the ROCA and associated gravel parking lot, footprints around targetry/objectives, trenching of electric and fiber optic cables and the potential power feed, and demolition of existing Range 15 target pits; all of which would result in the disturbance and exposure of soils (also see Section 3.3.2.2.3 regarding potential acreage of disturbances). Exposed soils would be more susceptible to erosion from stormwater runoff, which could result in increased sedimentation and turbidity to receiving waterbodies. Additionally, potential surface water contamination from hazardous spills could occur during construction activities.

During construction and once operational, JBLM YTC would continue to monitor project sites in accordance with Federal and state regulations for avoidance, minimization, and response to pollutant spills that could occur. Once the construction operator has developed a proper site specific CSWPPP, verified by JBLM YTC, the potential for impacts from facility construction on surface waters would be negligible.

After construction, all temporarily disturbed areas would be revegetated and stabilized (e.g., vegetation planting, protective fabric/matting). With implementation of BMPs, it is anticipated that impacts to surface waters during construction would be temporary and minor.

Operations

Overall adverse impacts from range operations would be negligible to minor. Normal operations of the CLF Range would generally not affect surface water quality. Occasional maintenance may require access to buried portions of the fiber optic lines and the power feed; however, BMPs, such as strategic placement of silt fencing and temporary drainage controls, would be used to avoid any indirect impacts (e.g. sedimentation and turbidity) to adjacent surface waters. Fires would also result from normal operations and have the potential to create indirect impacts on surface water resources of Selah Creek (i.e., increase in fines from burned areas resulting from fires occurring within the proposed CLF Range). These impacts, however, would be managed through use of BMPs such as revegetation of burned areas and temporary drainage controls. In addition, the use of an existing road as the designated CLF return route that is already siebert staked to demarcate sensitive areas would avoid adverse impacts along Selah Creek (e.g., loss of vegetation and increased erosion and sedimentation during runoff events) during CLF Range operations.

3.3.2.2.3 Impacts to Stormwater Management

Construction

Overall adverse impacts from range construction would be minor. The Proposed Action would disturb up to 45.2 acres of land during construction. This includes 24.6 acres for the installation of targetry/objectives. Although the Proposed Action would disturb approximately 24.6 acres for land preparation and installation of targetry/objectives, overall addition of impervious surface would be negligible for this activity and isolated to the specific target placed. The overall impervious surface area and appropriate BMPs would be determined in accordance with the Eastern Washington Stormwater Management Manual. The Proposed Action would utilize existing roads to the extent practical and create unimproved maintenance roads placed within each target disturbance area which would minimize the addition of impervious areas. The construction of an 800 square foot ROCA facility and associated parking lot would result in approximately 5.8 acres of impervious and semi-permeable surface. A majority of the 5.8 acres, however, is already cleared of vegetation and has a layer of rock in place. Installation of the fiber optic and electrical cables to targetry would require approximately 3.9 miles of trenching resulting in approximately 9.5 acres of land disturbance. The other option of using the potential hard power feed would require approximately 2.2 miles of trenching resulting in approximately 5.3 acres of land disturbance. Both of these activities would not increase the amount of impervious surface.

During construction, stormwater would continue to be managed through the natural setting of creeks and valleys. Development of unimproved maintenance roads are required to be in accordance with NPDES final stabilization requirements to provide for permanent cover. If the cables and potential power feed are not installed within existing roadbeds, disturbed areas would also be required to be in accordance with NPDES final stabilization requirements to provide for permanent cover. Stormwater and wastewater discharges are regulated under Sections 401 and 402 of the CWA (permitting requirements) through the NPDES. As there would be over 1 acre of disturbance, and construction activities could cause erosion of sediments into adjacent surface water features located onsite and offsite, the operator would obtain a NPDES General Permit from USEPA Region 10 prior to construction activities, which would require the preparation of a SWPPP. This plan includes BMPs for erosion control and pollution prevention requirements.

To minimize impacts to surface waters resulting from sediments carried in stormwater runoff, BMPs outlined in the CSWPPP would be utilized. These BMPs often include measures such as silt fencing, straw or wattles, and brush barriers. All are perimeter sediment control structures and when installed correctly and inspected frequently, can be effective barriers to prevent sediment leaving the site in stormwater runoff. Section 3.6.2.2 further details cover protection requirements for exposed soils.

Operations

Overall adverse impacts from range operations would be negligible. During operations, stormwater would continue to be managed through the natural setting of creeks and valleys with the exception of the parking lot. To reduce the amount of stormwater runoff, the parking lot would utilize alternative pavers, more specifically, gravel. If necessary, stormwater runoff from the 5.8-acre ROCA area would be managed through site design including the creation of upland release points (i.e., stormwater catch basin). Therefore, overall adverse stormwater impacts to the site during operations are expected to be negligible.

3.3.3 CUMULATIVE EFFECTS

The cumulative impacts ROI for surface waters consist of the Upper Yakima Watershed. Although the Proposed Action is not expected to degrade surface water quality directly, indirect impacts from the Proposed Action, the development of other projects, and general development anticipated to occur in the surrounding region could incrementally impact surface water quality. Each of the reasonably foreseeable projects identified for inclusion in this analysis (Table 3.1-2) would cause some degree of sedimentation

to water resources, aside from implementation of the Yakima Basin Integrated Water Resource Management Plan. The construction of a new 230 Kilovolt transmission line to be built by Pacific Power would potentially result in temporary adverse impacts to surface waters. Potential utility corridors include the crossing of streams, creeks and the Columbia River. The probability of impacts to occur would increase the closer construction activities are located to the surface water resources, with the greatest probability for impact occurring when utilities cross a surface water resource. Upon completion of any construction work, it is expected that disturbed areas would be re-vegetated to reduce or eliminate any long-term effects to water quality. The realignment, growth, and stationing of Army Aviation Assets and associated increased Soldier training levels would increase erosion potential during training activities. These impacts, however, would be managed in a similar manner by JBLM YTC as discussed for the Proposed Action in this EA. Cumulatively, these projects and increased training use of JBLM YTC in combination with the temporary minor soil erosion and sedimentation to result from the Proposed Action would not result in significant cumulative impacts.

The Yakima Basin Integrated Water Resource Management Plan would cumulatively improve the Upper Yakima Watershed by addressing a variety of water resource issues including affected fish passage and habitat and agricultural and domestic water supplies. This plan would work to restore the Yakima River's ecological functions therefore benefiting the entire watershed.

3.3.4 PROPOSED IMPACT REDUCTION MEASURES

As discussed within this section, no significant impacts to water resources are anticipated. To prevent water quality deterioration, all temporary construction-related footprint disturbances would be revegetated with appropriate plant species. The first and second order unnamed intermittent upland tributary drainages disturbed during trenching and underground utility operations would be restored to their original grades following construction. The dip point at Range 15 provides for improved fire suppression that reduces overall fire losses. The CSWPPP would be adhered to and would provide protection by ensuring contracts contain language requiring site operators to obtain an NPDES permit and develop a site-specific CSWPPP. The site-specific CSWPPP plan would include BMPs for erosion control and pollution prevention requirements. If necessary, stormwater runoff from the 5.8-acre ROCA area would be managed through site design including the creation of upland release points.

3.4 Biological Resources

3.4.1 AFFECTED ENVIRONMENT

3.4.1.1 Vegetation

JBLM YTC lies within the shrub-steppe Columbia River Basin province of eastern Washington and Oregon (Franklin and Dyrness, 1973). Shrub-steppe vegetation is characterized as the big sagebrush/bluebunch wheatgrass (*Artemisia tridentate*/*Pseudoroegneria spicata*) zone that was once widespread throughout the Columbia Plateau. The shrub-steppe community, once widespread in the region, has experienced a decline attributed to loss or alteration of habitat by humans and invasion by non-native species. Today, very little shrub-steppe remains undisturbed or unaltered from its condition prior to Euro-American settlement and it is considered one of North America's most imperiled and neglected ecosystems (Dobkin and Sauder, 2004). Historically, approximately 10.4 million acres of shrub-steppe existed in Washington prior to the arrival of settlers during the 19th century. Today, only about 40 percent of the original shrub-steppe in Washington remains due to changes in land use over the past century. Yakima County supports the largest amount of shrub-steppe in the state retaining 58 percent of its original acreage. The few remaining large areas of shrub-steppe in Washington are primarily on government holdings (JBLM YTC and Hanford Reach National Monument) and the Yakama Indian Nation. These properties may represent the only sites suitable for species requiring extensive areas of continuous shrub-steppe (Dobler et al., 1996).

Upland vegetation communities on the Installation consist of a mosaic of native and non-native grasslands and a variety of shrubland communities often composed of several species of Sagebrush (*Artemisia*). The intricate mosaic of these plant communities is the result of complex soil patterns, topography, precipitation, and past and current land uses. Historic and present day causes of disturbance to vegetation on JBLM YTC include grazing, fire, construction, road building, the deliberate and inadvertent introduction of non-native species, and maneuver training exercises. Disturbance reduces native plant species cover and diversity, changes species composition and structure, and increases the likelihood of invasion by non-native species. Native bunchgrasses and native forbs are particularly vulnerable to disturbances and have decreased dramatically in most portions of the shrub-steppe in Washington (U.S. Army, 2011).

The Proposed Action is within Range 15 or TA 12, which is a tank gunnery range. Thus, the site has been extensively altered, with associated vegetation disturbances, as a result of off road maneuver and digging activities. In addition, repeated wildland fires have substantially contributed to alterations of the landscape and vegetation composition and cover. Table 3.4-1 contains the vegetation types within TA 12.

The Range 15 area of the Proposed Action currently contains low vegetation cover density with exposed soils throughout its surface (see Figure 3.4-1). The area of the proposed ROCA and associated parking lot is mapped as big sagebrush/bluebunch wheatgrass, however, existing areas of crushed gravel restrict vegetation establishment within the proposed ROCA area. To the east, the proposed disturbance areas associated with the targetry/objectives are mapped primarily as bluebunch wheatgrass with some patches of areas mapped as Sandberg's bluegrass-cheatgrass (*Poa secunda-Bromus tectorum*). Most of the area around Selah Creek is mapped as riparian, which consists of streamside woody vegetation, though the only Proposed Action feature within this vegetation type is an existing road that would be used for the CLF Range. Figure 3.4-2 provides a map of the vegetation types in the ROI.

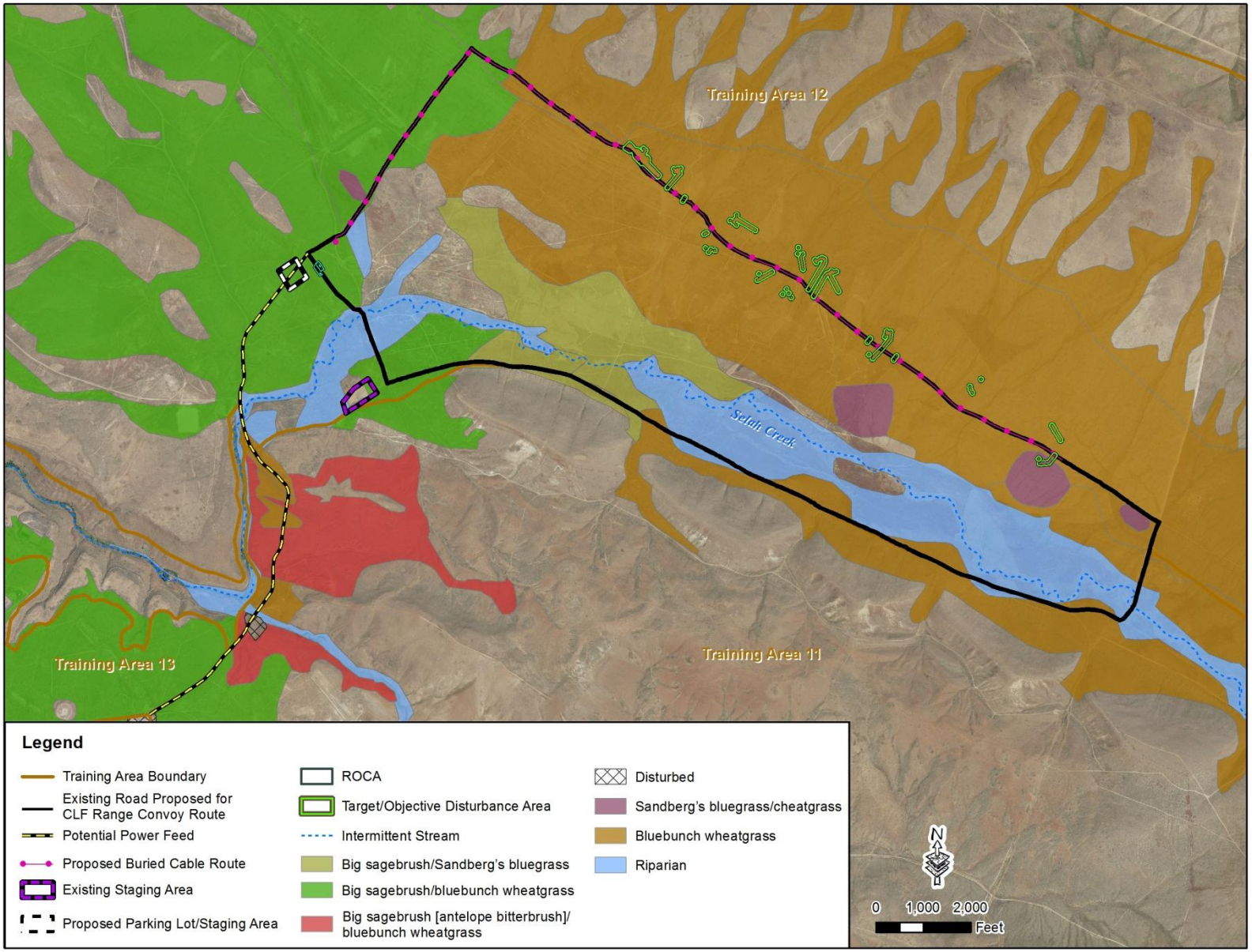
Table 3.4-1: Vegetation Classes within Training Area 12 (TA 12)

Vegetation Class Name	Code	Acres	Percent of Coverage
Bluebunch wheat grass	PSSP	5614.1	34
Big sagebrush/Bluebunch wheat grass	ARTR/PSSP	2821.7	17
Goldenweed/Sandberg‘s bluegrass	HAST/POSE	1991.5	12
Goldenweed/Bluebunch wheat grass	HAST/PSSP	1573	10
Big sagebrush[Antelope bitterbrush]/Bluebunch wheat grass	ARTR[PUTR]/PSSP	1012.9	6
Riparian	RIPARIAN	1016.9	6
Thymeleaf buckwheat/Sandberg‘s bluegrass	ERTH/POSE	779.6	5
Stiff sagebrush/Sandberg‘s bluegrass	ARRI/POSE	233.7	1
Big sagebrush/Sandberg‘s bluegrass	ARTR/POSE	227.9	1
Threetip sagebrush/Idaho fescue	ARTRP/FEID	244.6	1
Threetip sagebrush – Big sagebrush/Bluebunch wheat grass	ARTRP-ARTR/PSSP	179.4	1
Disturbed	DISTURBED	41.8	< 1
TOTAL ACREAGE		**16,441.6 Acres**	

Source: JBLM and WAARNG, 2010.

Source: Field photograph taken by PHE, November 2011.

Figure 3.4-1. View of Proposed Convoy Life Fire Range Project Area (Range 15) Looking East



Source: U.S. Department of Agriculture, 2011; Yakima Training Center, 2011. Created by PHE, October 2012.

Figure 3.4-2. Vegetation in the Proposed Convoy Live Fire Range Project Area

Noxious weed species can pose a threat to the ecological integrity of training lands, increasing soil loss and decreasing upland vegetative cover, surface water quality, and wildlife habitat. In addition, noxious weeds may potentially pose economic threats by spreading off the Installation to surrounding agricultural fields and waterways. Noxious weed control at JBLM YTC is accomplished through an Integrated Pest Management (IPM) approach, as documented in the IPMP, which is mandated by Federal and state noxious weed control statutes and AR 200–1. The IPM strategy focuses on long-term prevention or suppression of noxious weed problems using techniques that have a limited impact on the environment including natural biological control, low-toxicity pesticides, and mechanical control. As part of its pest management program, JBLM YTC controls noxious weeds in training areas, with a primary focus on knapweed (*Centaurea sp.*) and kochia (*Kochia scoparia*) control, and a lesser focus on musk thistle (*Carduus nutans*), Scotch thistle (*Onopordum acanthium*), Russian thistle (*Salsola kali*), and purple loosestrife (*Lythrum salicaria*); most of these species are common throughout the Range 15 area, including within the ROI.

3.4.1.2 Wildlife and Aquatic Life

3.4.1.2.1 Wildlife

The wildlife at JBLM YTC uses three predominant habitat types in accordance with their specific life history requirements: shrub-steppe uplands, cliffs and talus slopes, and riparian and permanently wet areas. Shrub-steppe uplands account for more than 95 percent of land coverage at JBLM YTC and provide life requisites for the majority of wildlife species that permanently or seasonally inhabit the Installation (U.S. Army, 2002). The open, shrubby habitats support numerous shrub-nesting and ground-nesting birds and mammals. In addition, reptiles and raptors feed on the diversity of small mammals and invertebrates that are found in the sage complexes of JBLM YTC. Cliffs and talus slope habitats provide shade, cover, and rearing sites. Habitats associated with watercourses, springs, and riparian communities support a wide variety of wildlife by providing drinking water, cover, and in some cases, important food and nesting opportunities.

On JBLM YTC there are approximately 246 species of wildlife that either occur or are expected to occur based on known ranges and habitat preferences (U.S. Army, 2002). Wildlife habitats characteristic of this region and JBLM YTC include those vegetation communities described in Section 3.4.1.1. Wildlife habitat elements include structural components, such as shrub height, percent shrub cover, and shrub age class. Wildlife habitat natural attributes are soil characteristics, cliffs, burrows, and large trees. Physical features are roads, buildings, towers, and lights. It is assumed that wildlife use habitat arranged or comprised of vital components that result in healthy and viable populations. Within the ROI, wildlife habitats consist of shrub-steppe habitats with primarily grassland cover with varying degrees of structural components and habitat elements associated with them. Selah Creek and associated riparian vegetation is also located within the ROI.

There are 22 species of reptiles and amphibians that are thought to occur at JBLM YTC. Four typically occur in sagebrush and talus slope habitats: side-blotched lizard (*Uta stansburiana*), sagebrush lizards (*Sceloporus graciosus*), western fence lizards (*Sceloporus occidentalis*), and striped whipsnakes (*Masticophis taeniatus taeniatus*). Species commonly found in riparian habitats include Pacific treefrogs (*Hyla regilla*) and long-toed salamanders (*Ambystoma macrodactylum*). Several other species are more evenly distributed throughout the JBLM YTC landscape, such as short-horned lizards (*Phrynosoma douglassii*), gopher snakes (*Pituophis melanoleucus*), and western rattlesnakes (*Crotalus viridis*) (U.S. Army, 2002).

The most common bird species found on JBLM YTC include horned larks (*Eremophila leucophrys*), western meadowlarks (*Sturnella neglecta*), Brewer's sparrows (*Spizella breweri*), vesper sparrows (*Pooecetes gramineus*), and sage thrashers (*Oreoscoptes montanus*). Other year-round utilizers of shrub-

steppe habitats include greater sage grouse (*Centrocercus urophasianus*), golden eagles (*Aquila chrysaetos*), prairie falcons (*Falco mexicanus*), common ravens (*Corvus corax*), and rock wrens (*Salpinctes obsoletus*). Summer residents include sage sparrows (*Amphispiza belli*), sage thrashers, and burrowing owls (*Speotyto cunicularia*). Winter residents include rough-legged hawks (*Buteo lagopus*) and rosy finches (*Leucosticte arctoa*). Common birds that inhabit riparian habitats include red-winged blackbirds (*Agelaius phoeniceus*), Bullock's orioles (*Icterus galbula*), American robins (*Turdus migratorius*), and brown-headed cowbirds (*Molothrus ater*). Several common birds use a combination of upland and riparian areas as habitats. Species include Brewer's blackbirds (*Euphagus cyanocephalus*), cliff swallows (*Hirundo pyrrhonata*), Swainson's hawks (*Buteo swainsoni*), and Wilson's warblers (*Wilsonia pusilla*). Common winter residents of this type are Northern shrikes (*Lanius excubitor*) and bald eagles (*Haliaeetus leucocephalus*). Riparian habitats provide some permanent water supplies for waterfowl (such as mallard [*Anas platyrhynchos*], gadwall [*Anas strepera*], and cinnamon teal [*Anas cyanoptera*]) and a variety of songbirds (U.S. Army, 2002).

Although many of these bird species are resident year-round on JBLM YTC, several species of birds, including raptors, waterfowl, sparrows, doves, and nighthawks are migratory birds that spend only a portion of the year on JBLM YTC. Migratory birds may winter or breed on JBLM YTC, or may just use the Installation for short periods while migrating between their breeding grounds to the north and wintering grounds to the south. Migratory birds are protected under the Migratory Bird Treaty Act of 1918 (MBTA) that provides protections to reduce the risk of harm to migratory birds or their habitats from Army or other Federal actions. The Bald and Golden Eagle Protection Act of 1940 (BGEPA) provides protection for bald and golden eagles.

Five small mammals represent 98 percent of all species identified during small mammal monitoring surveys conducted in 1990: deer mouse (*Peromyscus maniculatus*), sagebrush vole (*Lemmiscus curtatus*), Great Basin pocket mouse (*Perognathus parvus*), least chipmunk (*Eutamias minimus*), and northern pocket gopher (*Thomomys talpoides*). Additional small and mid-sized mammal species typically found on JBLM YTC include black-tailed jackrabbit (*Lepus californicus*), Townsend's ground squirrel (*Spermophilus townsendii*), Merriam's shrew (*Sorex merriami*), badger (*Taxidea taxus*), and long-tailed vole (*Microtus longicaudus*). Large mammals found at JBLM YTC include cougar (*Puma concolor*), coyote (*Canis latrans*), mule deer (*Odocoileus hemionus*), and elk (*Cervus elaphus*). Mule deer are the predominant large mammal found at JBLM YTC, while coyote primarily use shrub habitats for hunting small mammals. A small number of elk are year-round residents on JBLM YTC. Bats, including western small-footed bat (*Myotis ciliolabrium*), little brown bat (*Myotis lucifugus*), and big brown bat (*Eptesicus fuscus*), may roost in the cliffs and talus slopes and feed along the riparian drainages by night. Other bat species that are known or likely to use habitats on JBLM YTC include the pallid bat (*Antrozous pallidus*) and spotted bat (*Euderma maculatum*). Six species of mammal are typically found in riparian areas: raccoon (*Procyon lotor*), mink (*Neovison vison*), muskrat (*Ondatra zibethicus*), beaver (*Castor canadensis*), and montane vole (*Microtus montanus*) (U.S. Army, 2010).

3.4.1.2.2 Aquatic Life

Portions of the Columbia and Yakima River watersheds are on JBLM YTC. The Columbia and Yakima River systems support anadromous and resident salmonids, with numerous other cold water and warm water fish species. On JBLM YTC there are 10 to12 species of fish that either occur or are expected to occur based on known ranges and habitat preferences (U.S. Army, 2002).

The segment of Selah Creek within the ROI is intermittent and does not support any fish populations. The lower reaches of Selah Creek, however, are perennial with fish present at its confluence with the Yakima River near Pomona (located downstream of the Installation). The reach of the Yakima River adjacent to JBLM YTC supports a substantial recreational fishery for resident rainbow trout (*Oncorhynchus mykiss*). Although a small population of spring Chinook salmon (*Oncorhynchus tshawytscha*) occurs below the Roza Dam, the reach adjacent to JBLM YTC is the primary rearing habitat

for spring Chinook salmon juveniles originating from upper Yakima River spawning areas (Northwest Power Planning Council, 1990).

The reach of the Yakima River adjacent to JBLM YTC is a deep, narrow canyon. The river flow is fast with very few gravel bars to support anadromous fish spawning. The nearest salmon spawning area to JBLM YTC in this basin is below Roza Dam. The mainstem below Roza Dam becomes progressively degraded due to agricultural and municipal impacts. Fine sediment loading and high summer water temperatures from irrigation returns are the primary factors limiting salmonid production in the mainstem below Yakima. The stream reaches between JBLM YTC and the Yakima River, including Selah Creek, have been degraded because of grazing practices, reducing the likelihood of salmonids from the Yakima River occurring on JBLM YTC (U.S. Army, 2010).

3.4.1.3 Threatened and Endangered Species

Several species of fish, wildlife, and plants are of management concern to JBLM YTC due to their current or potential Federal status under the ESA, which prohibits the unauthorized "take" (i.e., harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct) of certain rare species. Section 7 of the ESA requires all Federal agencies to ensure that any action authorized, funded, or carried out by them is not likely to jeopardize the continued existence of protected species or adversely modify their critical habitat[2]. Federally-protected species can fall under one of two classifications:

- **Endangered** – Species, subspecies, or varieties in danger of extinction throughout all or a significant portion of their range.
- **Threatened** – Species, subspecies, or varieties likely to become endangered within the foreseeable future.

In addition, species can be designated as "proposed" or "candidate", which means that they are being considered for protection as either endangered or threatened. Proposed endangered or threatened species are those for which a proposed regulation, but not a final rule, has been published in the *Federal Register*. Candidate species are being considered for listing as endangered or threatened, but a proposed regulation has not yet been published in the *Federal Register*. Until a final rule is published, species listed as either proposed or candidate are not afforded any legal protections.

In order to be able to classify certain important individual populations of species under the ESA, two terms have been devised: Distinct Population Segment (DPS) and Evolutionarily Significant Unit (ESU). A DPS is a subdivision of a vertebrate species that is treated as a species for purposes of listing under the ESA. To be so recognized certain criteria must be met, including requiring that the population be readily separable from the rest of its species and be biologically and ecologically significant. An ESU is a Pacific salmonid fish stock that is substantially reproductively isolated from other stocks of the same species and which represents an important part of the evolutionary legacy of the species. Life history, ecological, genetic, and other information can be used to determine whether a stock meets these two criteria.

Table 3.4-2 provides a summary of threatened, endangered, and species of management concern applicable to JBLM YTC which was developed in consultation with USFWS and National Oceanic and Atmospheric Administration (NOAA) Fisheries web-based resources. The table also contains a review of species and habitat lists contained in recent Biological Assessments. This list is primarily related to ESA-protected species; however, bald eagle (de-listed from ESA protection) and golden eagle have been

[2] Critical habitat contains features essential for the conservation of a threatened or endangered species that may require special management and protection which are delineated by USFWS with appropriate public review and notification in the *Federal Register*.

included as species that are afforded protection under the BGEPA. It is important to note that no critical habitat for any species has been designated at JBLM YTC.

Table 3.4-2. Threatened, Endangered, and Species of Management Emphasis Potentially Affected by JBLM YTC Activities

Common Name and Species Type	Scientific Name	Status
Bald Eagle (bird)	*Haliaeetus leucocephalus*	BGEPA, MBTA
Golden Eagle (bird)	*Aquila chrysaetos*	BGEPA, MBTA
Columbia River DPS Bull Trout (fish)	*Salvelinus confluentus*	Threatened
Upper Columbia River Spring Run Chinook Salmon ESU (fish)	*Oncorhynchus tshawytscha*	Endangered
Upper Columbia River Steelhead Trout ESU (fish)	*Oncorhynchus mykiss*	Endangered
Middle Columbia River Steelhead Trout ESU (fish)	*Oncorhynchus mykiss*	Threatened
Ute ladies'-tresses (plant)	*Spiranthes diluvialis*	Threatened
Greater Sage-grouse Columbia Basin DPS (bird)	*Centrocercus urophasianus*	Candidate
Umtanum Desert Buckwheat (plant)	*Eriogonum codium*	Candidate

3.4.1.3.1 Bald Eagle

Effective July 28, 2007, the USFWS removed the bald eagle from the list of threatened and endangered species due to meeting or exceeding established recovery goals throughout the species range. However, the species is still afforded protection under the BGEPA and the MBTA.

Populations of breeding, wintering, and migratory bald eagles occur throughout Washington State. No known nesting occurs on JBLM YTC, as suitable nesting habitat does not currently exist; however, bald eagles have recently nested adjacent to the Installation along the Yakima and Columbia rivers. Known nesting has occurred adjacent to the Installation and the sites range from 3.5 to 6 kilometers from JBLM YTC's boundary (U.S. Army, 2011), but both are located greater than 18 kilometers away from the Proposed Action. Portions of the Installation contain suitable perching habitat for both wintering and migrating bald eagles from October through mid-to-late April. Suitable habitat for migrating and wintering bald eagles consist of diurnal perches adjacent to abundant sources of prey and nocturnal roost areas relatively free of disturbance. Wintering bald eagles found on JBLM YTC forage off the Installation primarily along the Wanapum and Priest Rapids Reservoirs. Wintering eagles frequenting the Columbia River have been known to roost at several sites on the Installation along Hanson Creek, at Borden Springs, and historically in Alkali Canyon. Known nocturnal roosts located along Hanson Creek consist of mature size cottonwood trees. The Borden Springs roost is approximately 26 kilometers southwest of the Proposed Action and the Alkali Canyon site no longer exists due to a wildland fire (U.S. Army, 2011). Although wintering/migrating eagles use the areas described above from October through April, the period of consistent daily use is from December through March and a peak in number and frequency of observations usually occurs in February. JBLM YTC manages bald eagles under an Endangered Species Management Plan that provides both spatial and temporal protection measures for both populations of wintering bald eagles and existing habitat, as well as restoration efforts for future habitat. No known sightings or suitable nesting and/or foraging habitat for bald eagles occurs within the ROI.

3.4.1.3.2 Golden Eagle

The golden eagle (*Aquila chrysaetos*) is not listed as a Federal threatened and endangered species, but is afforded protection under the BGEPA and the MBTA. The golden eagle is a year-round resident of JBLM YTC. Four historic nest sites have been identified on JBLM YTC. Golden eagles require isolation from human activity during the nesting season, February through June. The species builds its nests on cliffs. Military maneuver restrictions contained in Fort Lewis Regulation 420.5 include a 500-meter buffer between all military activities and all nest sites, a minimum of 300 feet above ground level for all over-flights of the nest sites, and no air traffic is allowed below the rim of Selah Canyon between Badger Pocket Road and the I-82 bridge (U.S. Army, 2011). Golden eagles have been observed within the general area of the Proposed Action. The ROI does not contain suitable nesting habitat for golden eagles, however it may be used for foraging as prey species (e.g., black-tailed jackrabbit, greater sage-grouse) are likely present.

3.4.1.3.3 Columbia River DPS Bull Trout

The USFWS designated the Columbia River DPS of bull trout as threatened on June 10, 1998 (63 *Federal Register* 31647). The Columbia River bull trout DPS consists of all bull trout populations in the Columbia Basin, which includes four major stocks: the Yakima; Wenatchee; Entiat; and Methow rivers. These rivers contain 39 subpopulations recognized by the Washington Department of Fish and Wildlife (WDFW) (WDFW, 1998) or alternately, 16 subpopulations as recognized by the USFWS. Bull trout are thought to be extirpated from two streams within the Columbia Basin: Satus Creek and Hanford Reach of the mainstem Columbia River. Of the 16 subpopulations recognized by USFWS, 10 are considered to be at risk of extinction (63 *Federal Register* 31651) (U.S. Army, 2011).

Factors contributing to the decline of bull trout in the Columbia Basin are similar to those affecting salmon, but also include additional elements. Since bull trout are less tolerant of higher water temperatures and sediment loading, they have been affected, to a greater degree, by logging practices, channelization, water diversions, mining, and grazing practices which have degraded riparian communities. Hydropower and storage dams hindered and precluded migrations normal for populations occurring in rivers and streams full-time and those that migrate between lakes and rivers and streams. Bull trout are highly susceptible to capture by anglers, because of their aggressive nature. As road networks have expanded and angler access has increased, bull trout populations have declined. Finally, bull trout will interbreed with brook trout, resulting in sterile hybrids. In the past, brook trout were planted widely in the Columbia Basin and elsewhere throughout the west (U.S. Army, 2011).

Bull trout in the Columbia Basin DPS spawn in September and sometimes into mid-October, depending on subpopulation. Variations in timing likely follow temperature patterns in the various tributaries. Movement into spawning areas is not well documented but would vary between resident, fluvial, and adfluvial type fish and habitat constraints in the various drainages. In general, movement toward spawning areas occurs in late summer. Spawning areas are characteristically cold, clean reaches within complex habitat, large woody debris, and preferentially with groundwater influence (U.S. Army, 2011).

Although there has been some mention of potential bull trout spawning and rearing habitat on JBLM YTC, this is highly unlikely. The streams on JBLM YTC are not cold enough for long enough periods of time to provide suitable spawning and rearing habitat. In addition, most streams do not have continuous flow from the Installation to either the Yakima or Columbia rivers during the time in which bull trout would potentially be spawning or migrating to spawn. However, bull trout could forage in streams on JBLM YTC for short periods of time when temperatures are tolerable and flows are perhaps more suitable. If there is any use, it is likely to be short term in nature and located at the mouths of streams during the colder months when streams may provide more tolerable temperatures and dependable flows. There is no suitable habitat for bull trout or any other fish species within the ROI as no perennial stream

reaches are located within the ROI. The segment of Selah Creek within the ROI is intermittent and does not support any fish populations (U.S. Army, 2011).

On October 18, 2010, the USFWS published their Final Rule revising designated Critical Habitat for bull trout throughout their U.S. range in the Federal Register. The USFWS designated approximately 765 miles of streams in the Columbia River Basin, which includes approximately 557 miles of the Yakima River, as Critical Habitat for the bull trout under the ESA. This designation encompasses reaches of the Yakima River and Columbia River adjacent to JBLM YTC (USFWS, 2010).

3.4.1.3.4 Upper Columbia River Spring Run Chinook Salmon ESU

NOAA Fisheries listed this ESU as endangered under ESA in March of 1999. The decline in abundance of upper Columbia River stocks began in the late 1800s due to over-harvest, hydropower development, creation of water storage reservoirs, water diversions, logging, mining, and domestic livestock grazing. In particular, Chief Joseph and Grand Coulee Dams on the Columbia River block access to a substantial portion of the historic range of this ESU. The upper Columbia and upper Snake tributary stocks are thought to be among the first to be decimated by the early fishery present on the Columbia River at the turn of the 19th century (U.S. Army, 2011).

Included in this ESU are all naturally spawned populations occurring in all accessible river reaches in the Columbia River tributaries upstream of Rock Island Dam and downstream of Chief Joseph Dam in Washington, excluding the Okanogan River. Nine Upper Columbia spring Chinook stocks occur in this ESU. The Upper Columbia spring Chinook salmon ESU includes all wild stocks upstream of the Wenatchee River confluence, and does not include the Yakima River system. All nine stocks are considered depressed, due either to chronically low escapement, a long-term negative trend, or a short-term severe decline in escapement. All stocks are native with wild production, except for the Methow stock, which has composite production because of hatchery stray introgression (U.S. Army, 2011).

All streams and drainages on JBLM YTC are located outside this ESU. The reach of Columbia River adjacent to JBLM YTC is a migratory corridor for these fish and individual residence times can be measured in days rather than weeks. Upriver runs start passing JBLM YTC in early May and extend through August, based on counts at Priest Rapid Dam. Spawning occurs from late August to mid-September and all documented spawning areas in this ESU are upstream of JBLM YTC and the ROI (U.S. Army, 2011).

Upper Columbia Chinook have a stream-type life history pattern, with an 18-month freshwater rearing period prior to migration to the ocean. Spring Chinook in the upper Columbia begin turning to smolt (i.e., the development stage when they first migrate to the ocean) and initiate migration in April, and may migrate in an early transitional state when they have not yet fully become smolt. They migrate past JBLM YTC from mid-April to early June as indicated from fish trapping records collected at Priest Rapids Dam. Wild spring Chinook in the Columbia River are mixed in with millions of hatchery spring Chinook released from facilities upstream (U.S. Army, 2011).

Habitat requirements for spring Chinook consist of water quality, passage, water velocity and, to a lesser extent, food availability. Chinook salmon have the lowest high-temperature threshold in the genus *Oncorhynchus*. Of the salmonids evaluated in this document, only bull trout require cooler water. Turbidity and sediment transport is an issue as it relates to food production. Gravel, cobble, and boulder substrates produce benthic macroinvertebrates when not embedded with sand or silt particulates. Chronic turbidity can also hinder the photosynthetic basis of the food web. Passage of downstream migrants as impacted by water velocity and dam design is a limiting factor affecting salmon stocks throughout the Columbia River system (U.S. Army, 2011).

Habitat on JBLM YTC is excluded from Critical Habitat designation for Upper Columbia spring-run Chinook salmon (Proposed Rule 2004) pursuant to the National Defense Authorization Act for Fiscal

Year 2004 (Public Law No. 108-136). However, the Columbia River immediately adjacent to the Installation is designated Critical Habitat for this ESU (U.S. Army, 2011).

3.4.1.3.5 Upper Columbia River Steelhead Trout ESU

NOAA Fisheries listed this ESU as endangered in 1997. The decline in the abundance of Upper Columbia steelhead mirrors that of Chinook, except for the commercial fishery. Commercial harvest of steelhead was never very large, reflecting the fact that steelhead populations have never been as large as Chinook populations (U.S. Army, 2011).

Three Upper Columbia River ESU steelhead stocks are present in the Columbia River adjacent to the Installation and include the Wenatchee, Entiat, and Methow/Okanogan populations. As with Chinook salmon, steelhead from the upper Columbia River are transient residents in the Wanapum and Priest Rapids Reservoirs of the Columbia River migrating past as either adults or juveniles. All three stocks are considered depressed, mixed stock, and maintained with composite production (U.S. Army, 2011).

Steelhead are the anadromous form of rainbow trout. Steelhead move to the ocean beginning in April and continue through June, with a peak around mid-April. Unlike other salmonids, adult steelhead usually survive spawning and migrate as individuals, rather than in schools. Spawning typically occurs in March, but may extend into July. The eggs incubate from late March through June, and fry may emerge from gravel from late spring to August. However, steelhead found near JBLM YTC in both the Yakima and Columbia rivers spawn from February to May, and fry emerge in May and June. Out-migration of smolts occurs from March to early June, with smolts having spent from one to seven years in freshwater, although the average is two to three years (U.S. Army, 2011).

Run timing of adult spawners is generally the same for the stocks listed above with small differences due to their position in the system. Steelhead pass by JBLM YTC from early June through mid-October as adults, entering natal rivers starting mid-July. Spawning occurs in the tributary rivers from March through May. After rearing for two to three years (or more), steelhead smolts migrate downstream past JBLM YTC from mid-March through mid-May (U.S. Army, 2011).

Habitat requirements for steelhead are essentially the same as for Chinook except that they can use smaller tributaries for spawning and prefer higher-gradient stream reaches. Temperature tolerances are also somewhat higher. Steelhead prefer cool water below 21° Celsius, but they can survive in waters from 0 to 26° Celsius. Steelhead require plenty of oxygen and can tolerate a wide range of salinities (U.S. Army, 2011).

Of the streams on JBLM YTC, Johnson Creek contains both resident (rainbow trout) and steelhead. As such, Johnson Creek is considered part of the Upper Columbia River Steelhead ESU. Several adults have been observed in the lower portion of this creek and are likely hatchery strays that have become naturalized over the years. Despite whether or not the fish observed in Johnson Creek were naturalized or not, it is certain they are not of Johnson Creek origin prior to 1967. Before the Wanapum Dam was constructed, Johnson Creek was physically separated from the Columbia River. It previously spilled out into a steep, porous alluvial fan of cobble deposited by the Missoula flood. The creek flowed below the ground surface through this formation before eventually connecting with the Columbia River. For the purpose of this analysis, naturalized steelhead that inhabit Johnson Creek, however few, will be considered part of the Upper Columbia River Steelhead ESU. Although located on the Installation, Johnson Creek is approximately 26 kilometers north of the Proposed Action and is upstream of any drainage flowing out of the ROI (U.S. Army, 2011).

There is no suitable habitat for steelhead or any other fish species within the ROI as no perennial stream reaches are located within it. Habitat on JBLM YTC is excluded from Critical Habitat designation for Upper Columbia River steelhead (Proposed Rule 2004) pursuant the National Defense Authorization Act

for Fiscal Year 2004 (Public Law No. 108-136). However, the Columbia River immediately adjacent to the Installation is designated critical habitat for this ESU (U.S. Army, 2011).

3.4.1.3.6 Middle Columbia River Steelhead Trout ESU

NOAA Fisheries listed this ESU as threatened in 1999. The Mid-Columbia ESU extends from the Klickitat River to the Yakima River, excluding the Snake River and includes reaches of the Klickitat, Deschutes, John Day, Umatilla, Walla Walla, Yakima, and Columbia rivers. The Yakima River is the only steelhead stock near JBLM YTC as it is located adjacent to the Installation's western boundary. The Yakima River flows into the Columbia River downstream of the JBLM YTC (U.S. Army, 2011).

Historically, the Yakima River steelhead run has been estimated to be approximately 10,000 fish (Busby et al., 1996). The current run size averages approximately 1,000 fish, with an escapement of about 800 wild fish. Stock status has been determined to be depressed because of chronically low spawner escapement. Within the Yakima basin, five distinct populations have been identified. These include runs to Satus Creek, Toppenish Creek, Naches River, the mainstem Yakima River between Rosa Dam and Wapato, and the mainstem Yakima River above Rosa Dam (U.S. Army, 2011).

The Yakima stock is a native, wild stock sustained by wild and artificial production. Causes for declines (in addition to the usual hydropower, habitat, hatcheries, and harvest problems in the Columbia basin) include passage at irrigation diversions, high temperatures/low dissolved oxygen, and a highly altered hydraulic regime (Northwest Power Planning Council, 1990). Storage reservoirs are operated in concert with water needs of an extensive irrigation program in the basin. This leads to an inverted hydraulic regime, with lower than optimal spring flow rates and excessive summer flow rates (U.S. Army, 2011).

Run timing in the Yakima is bimodal, with an early migration entering the river from September through November. The later migration is from February through June. Spawning occurs from mid-February to late May. Information on emergence timing for the mainstem river is lacking, but occurs May through June in Satus and Toppenish Creeks and from June to August in the colder Naches system. Smolt out-migration at Prosser occurs from early March through mid-June, mostly as two-year-olds. The median date for passage at Prosser is April 30 (U.S. Army, 2011). Habitat requirements for Mid-Columbia steelhead are similar to Upper Columbia steelhead as described in Section 3.4.1.3.5.

Critical habitat for the Mid-Columbia steelhead ESU has been determined to include all tributaries known to support steelhead within the ESU boundary, the mainstem Columbia River downstream of the Yakima River, and the Columbia River estuary. Habitat on JBLM YTC is excluded from Critical Habitat designation for Mid Columbia River steelhead (Proposed Rule 2004) pursuant the National Defense Authorization Act for Fiscal Year 2004 (Public Law No. 108-136). However, the Yakima River immediately adjacent to the Installation is designated Critical Habitat for this ESU. There is no suitable habitat for steelhead or any other fish species within the ROI as no perennial stream reaches are located within it (U.S. Army, 2011).

3.4.1.3.7 Ute ladies'-tresses

The USFWS listed Ute ladies'-tresses as a Federally threatened species on January 19, 1992, due to habitat loss and modification. Ute ladies'-tresses is a perennial, terrestrial orchid known to occur in eight states: Nevada, Utah, Colorado, Idaho, Washington, Nebraska, Wyoming, and Montana. In Washington, this species is known to occur in the north-central portion of the state (Okanogan and Chelan counties) (WDNR, 1999). Ute ladies'-tresses grows in lowland areas, at elevations ranging from 1,500 to 7,000 feet in the western region of its range usually abutting or near moderate gradient, medium to large streams and rivers. The plant is typically found in open riparian areas in the transition zone between mountains and plains. The species' microhabitat consists of grass-dominated openings in shrubby areas, often associated with beaked spikerush (*Eleocharis rostellata*). One of the key habitat features necessary for survival of Ute ladies'-tresses is saturated soil throughout the growing season. It is usually located within 12 inches

of the water table. While this species will tolerate periodic flooding, it does not occupy areas constantly inundated with water. Ute ladies'-tresses is commonly found in alkaline substrates. This species depends on natural disturbance, growing in areas where early successional conditions are perpetuated or competition from other vegetation is restricted. Riparian and wetland habitats that provide suitable habitat for Ute ladies'-tresses throughout its range have experienced impacts from urban development, stream channelization, water diversions and other watershed and stream alterations that degrade natural stream stability and diversity (U.S. Army, 2011).

Ute ladies'-tresses is listed by USFWS as a species that may occur in Kittitas and Yakima counties, Washington. Although potential habitat for this species may occur on JBLM YTC, Ute ladies'-tresses has not been documented to occur on the Installation. The ROI was surveyed between March 29 and June 15, 2012, during which time potentially suitable habitats for known rare plants were visited. The survey did not detect any occurrence of this species (SEE, 2012).

3.4.1.3.8 Greater Sage-grouse Columbia River DPS

The Columbia Basin DPS of greater sage-grouse is a Washington State threatened species and a Federal Candidate species under the ESA. This species (i.e., Columbia Basin DPS) is a Candidate for Federal listing due to a reduction in its range as a result of habitat conversion for development and agriculture and from intensive grazing and fire impacts. Suitable sage-grouse habitat consists of medium to dense sagebrush stands exhibiting a range of heights, as well as a variety of forbs and grasses. Sagebrush is an essential food for sage-grouse throughout the year and comprises 60 to 80 percent of the species' diet (WDFW, 2004). Sage grouse on JBLM YTC tend to use habitat with slopes of less than 15 percent and areas where the dominant species are Wyoming big sagebrush, three-tipped sagebrush, and bluebunch wheatgrass (Livingston, 1998). Shrubs provide nests with shelter from avian predators and weather elements while grasses provide shelter from ground predators and create a favorable microclimate (WDFW, 2004). Critical periods of sage-grouse life history include lek attendance (leks are assembly areas where males perform courtship displays to attract females during the mating season), nesting, and brood-rearing. Lek attendance is initiated in late winter/early spring and extends through mid-May. Nesting typically occurs March through May and brood-rearing extends through mid-June. Both nesting and brood-rearing occur in relatively close proximity (i.e., within 8 kilometers) to leks when suitable habitat exists (U.S. Army, 2011).

JBLM YTC supports one of two distinct populations still present in Washington and the largest and only population of sage grouse occurring primarily on Federally owned land. These remaining populations are isolated from each other and from larger contiguous populations located in the Columbia Basin and throughout the range of greater sage-grouse. Populations of sage-grouse on JBLM YTC have been characterized by short-term fluctuations and have exhibited trends similar to those of statewide populations, with male sage-grouse numbers per lek decreasing over time (Livingston, 1998). Annual surveys for leks and lek counts have been conducted on JBLM YTC since 1989 to monitor trends and assess population status.

Nineteen known leks were monitored in 2012 and seven were found to be active. Three of the 19 active leks were classified as major leks (i.e., 10 or more male sage-grouse observed at least once during the season). Historically, there was a lek area located a few thousand feet to the west of the Proposed Action, which was last used in 2002/2003. In 2012, the population estimate for sage-grouse on JBLM YTC was 146 and the 21-year population average was 274 since 1989.

Population declines in greater sage-grouse throughout Washington have resulted from large-scale removal of native vegetation for agriculture purposes, combined with reduced habitat quality caused by intensive grazing by livestock. Sagebrush removal using herbicides and fire have contributed to this decline as well (WDFW, 2004). From 1960 to 1995, land on JBLM YTC was used for livestock grazing, which likely resulted in decreased habitat quality for sage-grouse. Indirect threats to greater sage-grouse are habitat-

related and are primarily from fire and military training activities. Fire is a threat because it kills big sagebrush, and repeated fires will make an area vulnerable to invasions by noxious weeds such as cheatgrass and knapweed. Fire regimes in the lower Columbia River Basin were historically characterized by regular, low-intensity burns, which created a mosaic of seral stages. Following fire, natural re-establishment of sagebrush is slow (about 100-240 years) (Baker 2006). With the loss and fragmentation of shrub-steppe, fire poses a significant threat to remaining greater sage-grouse habitat in Washington. Furthermore, damage to soil and vegetation from vehicles and foot traffic associated with military training is a concern for sage-grouse and other wildlife.

The Proposed Action is just north/northwest of an area designated Land Use Zone 2, a sage-grouse protection area. Suitable habitat within the ROI may occur in the area of the proposed ROCA; however, the areas to the east proposed for the targetry/objectives contain mostly grassy vegetation, which would not be suitable to support sage-grouse due to a lack of an adequate sagebrush shrub component. In addition, habitat quality has been very much reduced due to previous wildland fires and maneuver training. Consequently, nesting and/or wintering habitat is not as ideal as in surrounding areas.

3.4.1.3.9 Umtanum Desert Buckwheat

Umtanum desert buckwheat is a Federal Candidate species with a Washington State status of threatened. As little information regarding this species exists, much of the following discussion on population trends, habitat, and threats to this species is provided from Washington Natural Heritage Program's Field Guide to Washington's Rare Plants. This endemic species is known from a single population located in Benton County in south-central Washington. It has been impacted in the past from wildland fire and is currently experiencing a declining trend in numbers. It is currently known to occur on Umtanum Ridge, southeast of the Installation (WDNR, 1997). As Umtanum Ridge bisects the entire Installation, suitable habitat for this species may exist on JBLM YTC. Numerous sensitive plant and vegetation surveys, however, have never recorded its occurrence on the Installation.

The known population occurs at elevations ranging between 1,100 and 1,320 feet on flat to gently sloping microsites near the top of the steep, north-facing basalt cliffs overlooking the Columbia River. It is apparently restricted to the exposed top of one particular basalt flow (the Lolo Flow). Associated species include spiny hopsage (*Grayia spinosa*), grayball sage (*Salvia dorrii*), threadleaf scorpionweed (*Phacelia linearis*), winged cryptantha (*Cryptantha pterocarya*), small evening primrose (*Camissonia minor*), and cheat grass (*Bromus tectorum*). The species' restriction to exposures of one particular basalt flow may suggest a dependent relationship with the chemical composition of that flow. The relatively high water-holding capacity of the substrate also has been suggested as an important factor. The overall vegetation is quite low in comparison with adjacent shrub-steppe vegetation communities characteristic of the Columbia Basin (WDNR, 1997). No suitable habitat for this species occurs within the ROI.

3.4.2 ENVIRONMENTAL CONSEQUENCES

Impacts to biological resources would be considered significant if Army actions resulted in:

- Long-term loss or degradation or loss of diversity within unique or high-quality plant communities;
- Unpermitted "take" of Federally listed species;
- Extirpation of rare or sensitive species not currently listed under the ESA;
- Unacceptable loss of critical habitat as determined by the USFWS;
- Non-compliance with policies, regulations, and permits related to wetlands conservation and protection; or
- High probability of increasing the frequency and intensity of wildland fires, especially in sensitive ecological areas.

3.4.2.1 No Action Alternative

Under the No Action Alternative, there would be no new construction and training activities would remain consistent with present levels; therefore, no new direct or indirect impacts to biological resources would occur.

3.4.2.2 Proposed Action Alternative

3.4.2.2.1 Impacts to Vegetation

Construction

Overall adverse impacts from range construction would be minor. Vegetation in the ROI consists of a shrub-steppe community in the area of the ROCA containing primarily big sagebrush and bluebunch wheatgrass. The area proposed for the targetry/objectives consists of grasses, primarily bluebunch wheatgrass with smaller communities of Sandberg's bluegrass/cheatgrass. The landscape and associated vegetation has a considerable disturbance history related to off-road maneuver activities, digging, and repeated wildland fires. Thus, the area currently contains low vegetation cover density with exposed soils throughout its surface.

During construction, minor impacts to the vegetation communities would result from land surface disturbances causing vegetation losses. Development of the ROCA and associated parking lot would initially require clearing the existing big sagebrush/bluebunch wheatgrass vegetation for site preparation and construction of these features would represent a permanent loss of habitat (approximately 5.8 acres) as these areas would be converted into impermeable and gravel surfaces. A total of 11 individual targetry/objective areas would be developed; these would require a total potential area of disturbance of 24.6 acres within primarily grassy habitat. It is presumed that the entire targetry/objective area would be temporarily disturbed and vegetation cleared for the placement of targets and associated infrastructure or via trampling by equipment and worker movements, though this is likely a conservative estimate.

Unimproved maintenance roads of approximately 10 feet wide would be developed to provide access to the targets which would require vegetation clearing; however, they would be placed within the targetry/objective disturbance areas currently characterized primarily as bluebunch wheatgrass with some patches of areas mapped as Sandberg's bluegrass-cheatgrass. Trenches for the placement of fiber optic and electric cables to targetry would disturb approximately 9.5 acres of land, and installation of the potential power feed would disturb approximately 5.3 acres of land. Trenching would occur directly adjacent to or within existing roads, therefore, it is expected that vegetation disturbances would be minimal or possibly avoided as these areas have been previously disturbed from road construction and use. If the lines were installed outside of these previously disturbed areas, potentially 2.8 acres of big sagebrush/bluebunch wheatgrass and 6.7 acres of bluebunch wheatgrass could be impacted from the fiber optic and electrical cables. An additional 3.4 acres of big sagebrush/bluebunch wheatgrass, 1.4 acres of bluebunch wheatgrass, and 0.3 acres of riparian vegetation communities could also be disturbed from installation of the potential power feed if the line is trenched outside of existing disturbed roadway areas; outside of the roadbed, an existing 0.2 acres of this area is already considered disturbed.

The demolition of existing target pits and development and use of borrow pits to supply fill material would likely result in some degree of surface and vegetation disturbances; however, overall land disturbances would be reduced to the extent practicable by utilizing existing berms/fill materials and ecology blocks to the maximum extent possible.

Surface disturbances and vegetation removal could provide open areas to induce the spread of noxious weeds within disturbed areas and into adjacent higher quality habitats. Following construction, temporarily disturbed areas would be replanted with native vegetation to prevent the spread of noxious weeds as well as maintain the shrub-steppe community and re-establish soil stability. Development of the

CLF Range would be performed in accordance with the JBLM YTC Noxious Weed Control Plan (YTC CNRMP, Appendix B), which includes measures such as biotic controls, application of herbicides, implementation of a vehicle wash policy, and revegetation, to control the spread of noxious weeds and reduce indirect impacts caused by the Proposed Action. Through the application of appropriate protective measures, negligible impacts would be expected in terms of noxious weed proliferation.

Operations

Overall adverse impacts from range operations would be less than significant. Impacts to vegetation would primarily be related to surface disturbances incurred during construction described previously. During operations, training activities may cause very minor surface disturbances that would likely have a negligible direct effects on vegetation resources. Range maintenance would include road maintenance activities that would likely include a small degree of vegetation removal to maintain access to targetry; however, these effects would also be negligible on overall vegetation resources.

During operations, the primary risk to vegetation resources would consist of wildland fire potential as the grassy vegetation in the areas of the targetry/objectives is highly flammable during much of the wildland fire danger season. Pyrotechnic devices and use of tracer rounds are typically the cause of wildland fires on a training range, which would be used during training. The potential for wildland fire ignitions due to training activities exists; should they occur they could increase erosion from loss of vegetative cover and could allow for invasion by noxious weeds in the affected area(s). The ROI currently is used as a tank gunnery range in which training with both small and large caliber weapons systems is performed and has a history of wildland fire disturbances. It is important to note that the Proposed Action is located within an existing wildland fire containment area and placement of additional dip ponds are currently planned within Range 15; thus, any wildland fire ignitions are expected to be contained within areas historically burned from training activities and would not likely burn large tracts of vegetation resources. Currently, however, a portable 10,000 gallon heliwell is placed seasonally at Range 15 and functions as an aerial fire suppression water source at the range until the additional dip ponds are completed (see Section 3.7, Wildland Fire).

3.4.2.2.2 Impacts to Wildlife and Aquatic Life

Construction

Overall, minor impacts to wildlife and aquatics would be expected. The overall level of construction disturbance from the Proposed Action would represent less than 1 percent of the habitat/vegetation classes presented in Table 3.4-1, resulting in minor disturbances to available wildlife habitat. Vegetation losses resulting from development of the ROCA, parking area, and targetry/objectives would represent habitat losses for terrestrial wildlife currently utilizing the shrub-steppe and grassland habitats onsite. The onsite habitats have historically been degraded due to training activities and repeated wildland fires and experiences ongoing levels of human disturbances (e.g., noise, vehicular movement, and general human presence and activity) which has likely resulted in some degree of avoidance of the area by wildlife. Thus, the existing habitat would be considered marginal in terms of overall quality. The movement and use of construction vehicles and equipment could cause accidental mortality of relatively smaller, less mobile species via collisions. None of the aforementioned impacts would result in any population level effects or losses of habitat critical to the survival of any wildlife species.

As shown in Appendix A, Table A-1, JBLM YTC provides foraging and breeding habitat for approximately 169 species of birds; 36 of which are migratory bird species recorded to nest on JBLM YTC within shrub-steppe habitat (the predominant habitat characteristic of the project area). Specifically, the construction disturbance footprints contain a total of 12.0 acres of big sagebrush/bluebunch wheatgrass and 32.7 acres of grassy habitat providing nesting habitat. Construction activities within the nesting season would likely be unavoidable. As stated in Section 2.4.2.1, construction of the CLF Range

would take approximately 1 year with most construction activities not being feasible during winter months.

Table A-2 (Appendix A) contains an analysis of these 36 species and their specific nesting requirements; of which 22 species of migratory birds have the potential for nesting within the construction disturbance footprints. The proposed construction activities associated with the CLF Range; therefore, could have an adverse impact to migratory bird nests within the construction disturbance footprints. The assessment in Table A-2 takes into account existing training levels and the likely avoidance of many of these species from nesting within this area of Range 15 due to current training activities. Annually, training is scheduled within Range 15 for approximately 242 days per year, with an average actual annual usage of 210 days per year. These training days area spread throughout the calendar year; therefore, on-going human activities would likely reduce the potential for ground and shrub-nesting species within the project area and more specifically within the approximate 45.2 acres being disturbed during construction.

As demonstrated in Table A-2, construction activities would have the potential for an immediate but minimal impact on these 22 species. Of these 22 species, the following 6 may experience a short-term minor impact due to lower regional population levels if an active nest were disturbed during construction: sage sparrow, short-eared owl, burrowing owl, northern harrier, loggerhead shrike, and common poorwill.

The potential loss or unintentional "take" of active nests for these species would be minimal and would not significantly affect regional population levels. Indirect impacts of habitat loss are also not to the level that would result in a significant impact to any migratory bird species. With the exception of the 5.8 acres required for the ROCA and associated parking lot, a majority of the other impacts would be temporary. In order to further reduce the potential for disturbance to these species, ground-clearing activities, to the greatest extent possible, would be conducted outside the nesting season. Furthermore, as stated in Section 3.4.2.2.1, the estimated levels of disturbance for targetry placement are conservative (most likely an over-estimate of actual clearing needed. If ground clearing activities are conducted within the nesting season, the amount of ground clearing activities would be minimized to the greatest extend practical.

As stated in Section 3.3.2.2.1, installation of the proposed fiber optic and electric cables to targetry would involve 14 crossings of unnamed intermittent upland tributary drainages to Selah Creek and installation of the potential power feed would involve 3 crossings of unnamed intermittent upland tributary drainages to Selah Creek and 1 crossing of Selah Creek (see Figure 3.3-1 for potential stream crossings). Direct disturbances to aquatic life would be unlikely as these features within the ROI are intermittent and the crossing of Selah Creek would likely be avoided as the proposed power feed would be placed through the existing utility sleeves installed in the existing culverted crossings of Selah Creek. It is possible, but unlikely that eroded sediments resulting from earth disturbing activities associated with site preparation and construction would have any greater than a negligible impact on the creek and associated aquatic life due to the distance. In addition, CSWPPP construction BMPs (e.g., the use wattles and silt fencing and revegetating temporarily disturbed areas) would be employed to limit the amount and movement of eroded soils. It is important to note that the segment of Selah Creek in vicinity of the Proposed Action flows intermittently and no fish populations occur within it. No downstream impacts on the Yakima River and resident aquatic species would be anticipated.

Operations

Overall adverse impacts from range operations would be less than significant. Impacts to wildlife would primarily be related to surface disturbances and associated habitat losses incurred during construction described previously. Operations would involve the use of small arms (i.e., .50 caliber and smaller), movement of vehicles, and general human activities, which would likely serve as disturbances that would cause a degree of wildlife avoidance; however, this effect is considered to be negligible considering the existing use of the area as a tank gunnery range likely results in current wildlife avoidance. As described in Section 3.4.2.2.1, wildland fire risk could be associated with operation of the CLF Range, which could result in vegetation and associated wildlife habitat losses and possible species mortality. Though, the

wildland fire risk as a result of the Proposed Action would likely be no greater than the existing risk associated with JBLM YTC operations (see Section 3.7, Wildland Fire). Riparian vegetation exists near the Proposed Action around Selah Creek; however, the only project feature in the immediate area is an existing road, which would be the main route through the range. Vehicle movements on the road may cause noises that result in a degree of wildlife disturbance; however, this effect would be negligible as the road is already existing and used. None of the aforementioned impacts would result in any population level effects or losses of habitat critical to the survival of any wildlife species. There are no activities proposed that would be expected to cause surface disturbances that could affect migratory bird nests; thus, no violations of the MBTA would be expected.

Maintenance of the CLF Range during operations would have minimal adverse impacts on migratory birds. Occasional and localized ground disturbance could occur around the objectives and within the maintenance roads throughout the lifetime of the CLF Range. To reduce the probability of take, JBLM YTC would, to the greatest extent possible, conduct maintenance activities outside of the nesting season.

Negligible impacts to aquatic species would be expected. Maintenance activities associated with the use of targetry/objectives may cause a small degree or eroded sediments; however, the closest targetry/objective area to Selah Creek is over 1,000 feet away; thus, it is not expected that eroded sediments would reach the creek at a degree to produce a noticeable effect. The main route through the range would include two Selah Creek crossings on an existing road; vehicular movements on the road would likely cause a small degree of sedimentation to the creek, though these effects also would be unlikely to produce a noticeable effect. No downstream impacts on the Yakima River and resident aquatic species would occur.

3.4.2.2.3 Impacts to Threatened and Endangered Species

The analysis below has resulted in a determination of "no effect" for the proposed CLF Range for all Federal listed threatened and endangered species. The greater sage-grouse is a Federal Candidate species, which does not require ESA consultation with USFWS. Although there is no requirement for formal or informal consultation for Candidate species, greater sage-grouse, an Army's species at risk, is included below given its management emphasis on JBLM YTC and the Installation's commitment to management of this species.

Construction

Bald Eagle and Golden Eagle

There is no suitable nesting habitat for bald eagles or golden eagles within the ROI and no impacts are expected. Foraging habitat for golden eagles exists within the ROI and habitat losses associated with development of the Proposed Action may reduce foraging habitat by a relatively small degree. This effect would be expected to be negligible as relatively large amounts of suitable foraging habitat would continue to exist in the area.

ESA Listed Salmonid Fish Species (Bull Trout, Chinook Salmon, Steelhead Trout)

There are no fish-bearing streams in the ROI as that segment of Selah Creek flows intermittently and does not support any fish populations. Any adverse effects on water quality and aquatic habitat resulting from sedimentation generated during construction would be highly localized and would not extend downstream to the Yakima River. Thus, no impacts on any fish species would be expected.

ESA Listed Plant Species (Ute Ladies'-tresses and Umtanum Desert Buckwheat)

The Proposed Action does not include disturbances to wetland/riparian habitats, which would support Ute ladies'-tresses and this species has not been documented on JBLM YTC. The Proposed Action also does not include disturbances to basalt cliff habitat, which could support Umtanum desert buckwheat and this species has also not been documented on JBLM YTC. In addition, a vegetation survey conducted during the first half of 2012 did not note either of these ESA listed plant species in the construction footprint or the ROI. Thus, no impacts to ESA listed plant species would be expected.

Greater Sage-grouse

The proposed location of the CLF Range is adjacent to an area designated Land Use Zone 2 – Sage-grouse Protection Area, though none of the Proposed Action features are within this zone. Vegetative habitat in the area of the proposed ROCA and associated parking lot consists of big sagebrush/bluebunch wheatgrass, which could be suitable for sage-grouse use. In addition, a historic lek area was located to the north/northwest of the Proposed Action near an old air field; however, the area was last used in 2002/2003. Development of the ROCA and associated parking lot would remove approximately 5.8 acres of habitat that may be suitable for sage-grouse use. As previously stated, there is currently no documented use of the area by sage-grouse, however, any loss of suitable sage-grouse habitat would be mitigated through off-site restoration at a 3:1 ratio. Therefore, negligible impacts would be expected related to habitat loss.

Vegetative habitat in the ROI to the east of the ROCA where the targetry/objectives would be located consists primarily of bluebunch wheatgrass and Sandberg's bluegrass-cheatgrass and would not be expected to support sage-grouse as they utilize areas containing a medium to high density of sagebrush, their primary food source. In addition, the habitat is sparse because of historic land disturbances associated with off-road maneuver activities and wildland fires. Thus, the marginal habitat quality and overall disturbance history has likely caused some degree of avoidance of the area by sage-grouse.

Following construction, temporarily disturbed areas would be revegetated to prevent encroachment of noxious weeds, which could reduce overall sage-grouse habitat quality further if allowed to spread. A positive aspect of range construction here is the prospect of establishing native vegetation during the construction phase of the project.

The proposed location of the CLF Range is adjacent to Land Use Zone 2, the Sage-grouse Protection Area. The management of this protective area is designed to maximize military training within the zone while at the same time providing for the sage-grouse. The Sage Grouse Management Plan provides protection and management measures that apply to this land use zone. Leks are afforded special protection during the breeding season, 1 March to 15 May. During this time, all activities are restricted within a 1 kilometer radius of the lek between the hours of 2400 and 0900 and weapons firing is only allowed on established ranges between the hours of 0900 and 2400. Construction, as well as maintenance and repair activities, would be accomplished outside the nesting and brood rearing protection period to the greatest extent possible. When such activities must occur during the protection period, all actions are reviewed by the JBLM YTC wildlife biologist to ensure disturbance to sage-grouse is minimized and habitat protection is maintained.

Operations

Bald Eagle and Golden Eagle

There is no suitable nesting habitat for bald eagles or golden eagles at the proposed site and no impacts are expected. Foraging habitat for golden eagles exists within the Proposed Action footprint and noise and human disturbances in the area may cause avoidance by golden eagles, thus reducing available foraging habitat by a relatively small degree. This effect would be expected to be negligible as the existing use of the area as a tank gunnery range likely causes current golden eagle avoidance.

ESA Listed Salmonid Fish Species (Bull Trout, Chinook Salmon, Steelhead Trout)

There are no fish-bearing streams in the area of the Proposed Action as that segment of Selah Creek flows intermittently and does not support any fish populations. Any adverse effects on water quality and aquatic habitat resulting from sedimentation generated during vehicle movements and targetry/objective maintenance activities would be highly localized and would not extend downstream to the Yakima River. Thus, no impacts on any fish species would be expected.

ESA Listed Plant Species (Ute Ladies'-tresses and Umtanum Desert Buckwheat)

The Proposed Action does not include disturbances to wetland/riparian habitats, which would support Ute ladies'-tresses and this species has not been documented on JBLM YTC. The Proposed Action also does not include disturbances to basalt cliff habitat, which could support Umtanum desert buckwheat and this species has also not been documented on JBLM YTC. As previously stated, a vegetation survey conducted during the first half of 2012 did not note either of these ESA listed plant species in the construction footprint or the ROI. Thus, no impacts to ESA listed plant species would be expected from CLF Range operations.

Greater Sage-grouse

Overall, it is anticipated that operation of the CLF Range may affect, but would not likely adversely affect sage-grouse populations. Noise and land disturbing activities may cause a degree of avoidance of the area by individuals; however, the area's existing use as a tank gunnery range likely results in avoidance of the area currently. In addition, the training area that would contain the targetry/objectives does not contain suitable sage-grouse habitat and no major disturbances would occur in the immediate area of the ROCA, where suitable habitat does exist.

Operation of the CLF Range would involve the use of pyrotechnics and tracer rounds, which can be wildland fire ignition sources. The possibility of wildland fires from ricochets and human carelessness will always exist as well. Wildland fire ignitions would have the potential to spread and could destroy sage-grouse habitat. The Proposed Action is located within an existing wildland fire containment area; thus, any wildland fire ignitions are expected to be contained and would not burn large tracts of vegetation resources. Also, as discussed in Section 3.7, Wildland Fire, operation of the CLF Range would not create a greater ignition risk as compared to the existing risk related to CLF training in temporary locations and operation of the existing tank gunnery range.

3.4.3 CUMULATIVE EFFECTS

Overall, the Proposed Action's contribution to cumulative impacts would be minor consisting of vegetation and associated habitat losses. Each of the reasonably foreseeable projects identified for inclusion in this analysis (Table 3.1-2) would cause some degree of vegetation and habitat losses in shrub-steppe or scrub-shrub habitats, aside from implementation of the Yakima Basin Integrated Water Resource Management Plan. The proposed WAARNG TUAS Training Facility, located directly west of the proposed CLF Range would adversely impact vegetation and on sage grouse habitat; however, revegetation of big sagebrush/bluebunch wheatgrass vegetation communities in areas previously disturbed would offset cumulative reductions in native vegetation communities and habitat loss from facility

construction. As identified in previous NEPA documents, such as the GTA EIS, the cumulative effects of habitat losses from training, most notably those potentially associated with wildland fire, could cause significant impacts. This continues to be true, though the effect of CLF Range development would be a loss of habitat that has historically been degraded and susceptible to wildland fire from existing CLF training and other training activities; therefore, the Proposed Action's contribution would be negligible to minor. Any suitable sage-grouse habitat impacted from the development of the ROCA would be mitigated through off-site restoration at a 3:1 ratio.

In addition, the proposed WAARNG TUAS would require a power feed from the existing ROCA area to its proposed location along the Selah Airstrip. The proposed power feed route would likely overlap portions of its alignment with the potential power feed proposed for the CLF Range. Overall, anticipated soil impacts during construction between these two projects for the potential power feeds would likely be reduced. Depending upon the timing of construction of these projects, the power feed would tap into the closest available connection point.

3.4.4 PROPOSED IMPACT REDUCTION MEASURES

As discussed within this section, no significant impacts to biological resources are anticipated. To reduce adverse impacts to biological resources, all temporary construction-related footprint disturbances would be revegetated with appropriate species. Groundcover revegetation would occur on-site at 1:1 ratio and disturbances to shrub-steppe vegetation (sage-grouse habitat) would be mitigated through off-site restoration at a 3:1 ratio. These measures would also serve to reduce the spread of noxious weeds, however, noxious weed management may be necessary to prevent the spread of invasive species in disturbed sites. Existing mitigation associated with the 2011 Fort Lewis GTA action includes a requirement for the development of 12 additional storage and dip pond facilities across JBLM YTC. When complete, the dip ponds would provide additional ability to suppress wildland fire and wildland fire spread, further reducing the potential for adverse impacts to biological resources (e.g., habitat loss and mortality) from wildland fire.

Protection of newly discovered active leks outside current Sage-grouse Protection Area will be assessed on a case by case basis and may include protective measures outlined in the Sage-grouse Management Plan which establishes a 1 kilometer protection radius from active lek areas. Leks would be afforded special protection during the breeding season, 1 March to 15 May. During this time, all activities are restricted within a 1 kilometer radius of the lek between the hours of 2400 and 0900 and weapons firing is only allowed on established ranges between the hours of 0900 and 2400. Maintenance and repair activities would be accomplished outside the nesting and brood rearing protection period to the greatest extent possible. When such activities must occur during the protection period, all actions are reviewed by the JBLM YTC wildlife biologist to ensure disturbance to sage-grouse is minimized and habitat protection is maintained.

3.5 Cultural Resources

3.5.1 AFFECTED ENVIRONMENT

For purposes of this section of the EA, and consistent with the rules of the Advisory Council on Historic Preservation implementing the National Historic Preservation Act (NHPA) Section 106 (36 CFR 800), the geographic area or study area (ROI) of analysis for cultural resources is referred to as the "Area of Potential Effect" (APE). During cultural resource reviews, JBLM YTC assesses adverse effects on the identified cultural resources based on criteria found in the Integrated Cultural Resources Management Plan (ICRMP). The determination typically results in a 'no adverse effect' or an 'adverse effect.' For the purposes of this EA, a determination of adverse effects to cultural resources would be considered significant.

3.5.1.1 Installation Cultural Resources Management Program and Process for Identification of Resources

JBLM YTC has an ongoing program to identify cultural resources, as per the requirements of Sections 106 and 110 of the NHPA. The specific processes for identification and management of cultural resources is presented in the *Integrated Cultural Resources Management Plan 2008-2012* (YTC, 2008). Much of JBLM YTC has been inventoried for archaeological and architectural resources. Ongoing identification and evaluation efforts target Traditional Cultural Properties (TCPs) and Sacred Sites. The ICRMP defines Standard Operating Procedures (SOPs) for the implementation of Section 106 compliance at JBLM YTC.

In addition to the typical Section 106 issues, JBLM YTC also operates under the mandates of the Treaty of 1855. This treaty assures that local Native American groups retain the right to use the lands including JBLM YTC for customary subsistence and ceremonial activities. If Native Americans request use of lands/resources within JBLM YTC, the Federal government must accommodate this request, as feasible. The request can be made whether or not the targeted area might qualify as a National Register of Historic Places (NRHP)-eligible TCP.

3.5.1.2 Archaeological Sites

The entire APE has previously been subjected to archaeological inventory. There are seven archaeological sites within 500 meters of the proposed utility lines, building, parking area, and target locations under the Proposed Action Alternative, but none are within the APE. Four of these sites have been recommended not eligible for the NRHP, and will require no further management.

3.5.1.3 Architectural and Historic Resources

The entire APE has previously been surveyed for architectural resources, and none are present. In addition, the APE lacks any Cold War buildings that may attain eligibility in the near future.

3.5.1.4 Native American Sacred Sites and Properties of Traditional and Religious Cultural Importance

There has not been an inventory of Sacred Sites/TCPs for the APE, and no such resources have been reported.

3.5.1.5 Areas of Contemporary Native American Use

There has not been an inventory of Areas of Contemporary Native American Use (ACNAU) in the APE. No ACNAUs have been reported for the APE.

3.5.2 ENVIRONMENTAL CONSEQUENCES

Impacts to cultural resources would be considered significant if the Proposed Action would:

- Permanently restrict access of tribal members to traditional cultural properties or sacred sites;
- Appreciably increase safety risks to tribal members using traditional cultural properties or sacred sites;
- Result in a long-term loss or degradation of plant or animal populations of traditional cultural importance to Native Americans; or
- Diminish the integrity of a historic property or archaeological site such that it was no longer eligible for listing in the NRHP.

3.5.2.1 No Action Alternative

Under the No Action Alternative, training would continue using existing facilities. There would be no new undertaking, and no new impacts.

3.5.2.2 Proposed Action Alternative

3.5.2.2.1 Impacts to Archaeological Sites

Construction

No adverse impacts from range construction would be anticipated. Ground-disturbing activities can compromise the spatial integrity and research potential of archaeological resources. The construction of targets and buildings, and the installation of utility lines and proposed demolition activities would have no impacts to any archaeological sites eligible for or listed on the NRHP, as there are no sites in the APE.

Operations

No adverse impacts from range operations would be anticipated. The live-fire training on the proposed range could affect archaeological sites through the direct impact of munitions. There are no NRHP-eligible archaeological resources within 380 meters of any proposed target, and this buffer is considered sufficient to assure that training operations would not impact archaeological sites.

3.5.2.2.2 Impacts to Architectural and Historic Resources

Construction

No adverse impacts from range construction would be anticipated. In general, construction activities can damage buildings, can alter viewsheds, and can introduce temporary noise and dust intrusions. There are no NRHP-eligible architectural or historical resources in the project vicinity. There would be no construction impacts to architectural and historic resources.

Operations

No adverse impacts from range operations would be anticipated. Live-fire training could theoretically result in direct percussion damage (from munitions strikes), noise, and dust. There are no NRHP-eligible architectural or historic resources in the project vicinity, and the area is currently subjected to noise and dust from the present training. There would be no operation impacts to architectural and historic resources.

3.5.2.2.3 Impacts to Native American Sacred Sites/TCPs

Construction

Overall impacts from range construction would be less than significant. Construction activities can compromise the integrity of sacred sites or TCPs, either through direct disturbance of the location, or by introducing temporary noise or dust that would interfere with the traditional or sacred use of the site. In this instance, there are no known Sacred Sites or TCPs in the project vicinity. However, until a TCP/Sacred Sites survey has been completed, it would not be possible to evaluate construction impacts. Necessary surveys would be conducted prior to construction and any sites identified would be managed according to the ICRMP.

Operations

Overall impacts from range operations would be less than significant. The operation of a live-fire range can affect Sacred Sites/TCPs through direct munitions strikes, through limiting safe access, through introducing accidental fires, and through the introduction of noise and dust. There are no known Sacred Sites or TCPs in the project vicinity, and live-fire exercises are presently conducted in this area. However, until a TCP/Sacred Sites survey has been completed, it will not be possible to evaluate operation impacts. Necessary surveys would be conducted prior to construction and any sites identified would be managed according to the ICRMP.

3.5.2.2.4 Impacts to ACNAU

Construction

Overall impacts from range construction would be less than significant. Construction activities can alter the ground surface, impacting plants and animal resources or topography related to ACNAUs. Construction activities can also create access/safety issues, and can introduce noise and dust. There are no ACNAUs known for the project vicinity, and live-fire training is ongoing in the area. Until an ACNAU survey has been completed, it will not be possible to definitively evaluate construction impacts. Necessary surveys would be conducted prior to construction and any ACNAU impacts identified would be managed according to the ICRMP.

Operations

Overall impacts from range operations would be less than significant. Operation of a live-fire range can directly impact ACNAUs through the impact of munitions. Operations can also create access/safety issues, and can introduce noise and dust. Accidental fires are also a risk. There are no ACNAUs known for the project vicinity, and live-fire training is ongoing in the area. Until an ACNAU survey has been completed, it will not be possible to definitively evaluate operation impacts. Necessary surveys would be conducted prior to construction and any ACNAU impacts identified would be managed according to the ICRMP.

3.5.3 CUMULATIVE EFFECTS

As the Proposed Action would have no impacts on archaeological resources, architectural, and historic resources, the Proposed Action would not contribute cumulatively to other projects identified in Table 3.1-2 that have or could adversely impact these resources. Cumulative impacts to TCPs, Sacred Sites, and ACNAUs are anticipated to be beneficial. A continued focus on the identification and protection of these resources would provide an overall benefit; military stewardship of the resources within the study area will likely maintain the integrity of these resources.

3.5.4 PROPOSED IMPACT REDUCTION MEASURES

This analysis has identified no significant impacts to archaeological resources, architectural and historic resources. Necessary surveys regarding TCPs, Sacred Sites, and ACNAUs would be conducted prior to

construction and identified resources would be managed according to the ICRMP during both construction and operations of the proposed CLF Range. The ICRMP for JBLM YTC outlines management practices and specific SOPs for cultural resources located on JBLM YTC. Implementation of the procedures set forth by the ICRMP will mitigate or avoid impacts to cultural resources located in the study area. The Treaty of 1855 defines the nature of Native American rights to continued use.

3.6 Soil Resources

3.6.1 AFFECTED ENVIRONMENT

3.6.1.1 Soils

Most of JBLM YTC and much of the surface of the Columbia Plateau were covered with basalt flows in the Miocene era (13 -16 million years ago), which was followed by a period of loess (wind - blown silt) deposition in the early Pleistocene. Later Pleistocene glaciations resulted in a mixture of soil parent materials, including glacial outwash, loess, residuum, alluvium, and basaltic colluviums distributed throughout the landscape. The predominance of silt loams in surface horizons on JBLM YTC is characteristic of arid to semiarid climates. These soils are fragile and easily eroded or broken down by vehicle traffic. In addition, there are some minor areas of bottomland or alluvial soils, primarily near the Columbia River and in the Cantonment Area (U.S. Army, 2011).

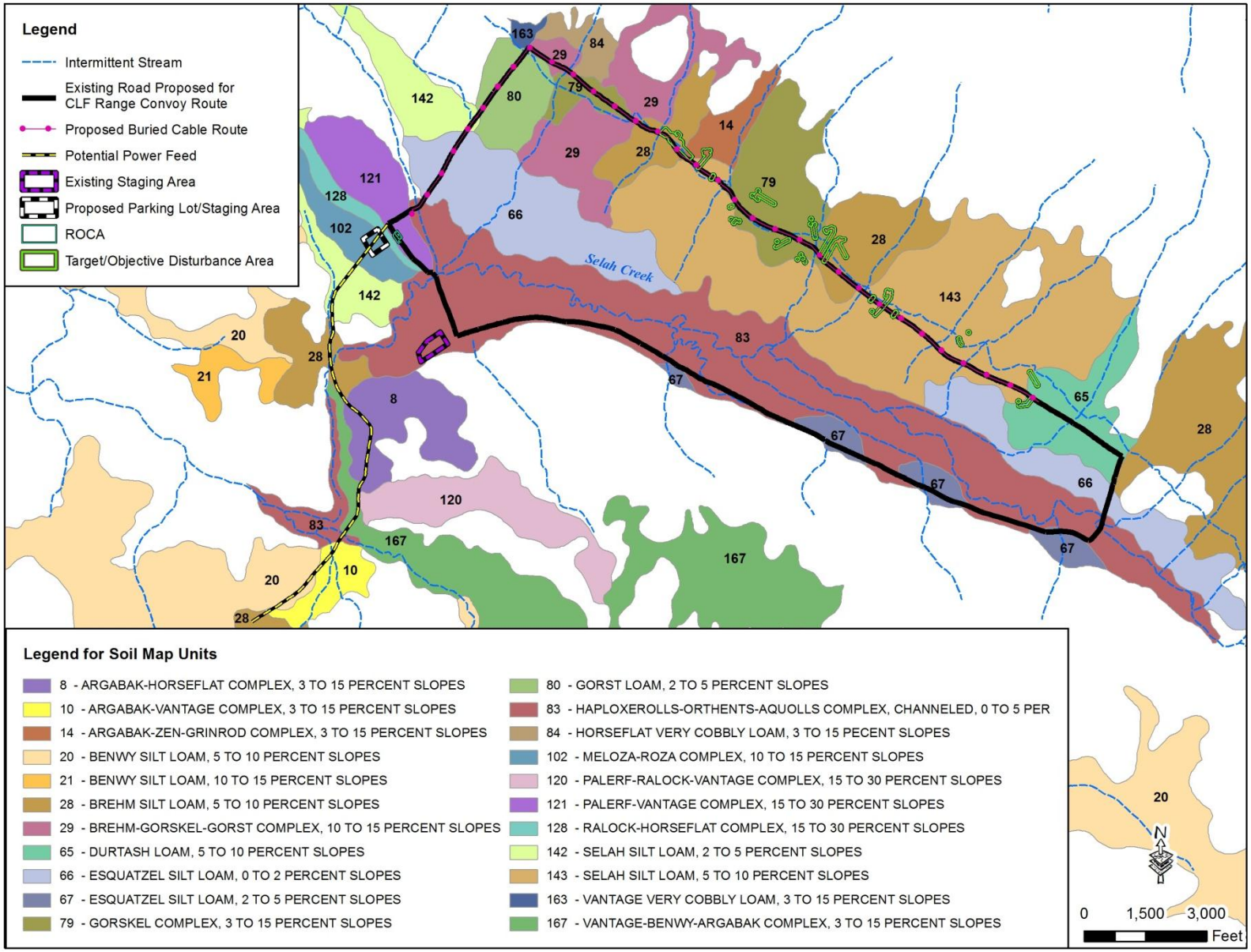
The Proposed Action is located within Range 15, which is a tank gunnery range. Thus, the site has been extensively altered through off road maneuver and digging activities, resulting in soil disturbance. In addition, repeated wildland fires have substantially contributed to alterations of the landscape and vegetation composition and cover, leading to further disturbance and weakening of soils. The area currently contains low vegetation cover density with exposed soils throughout its surface. Existing target pits, trails, and berms are located throughout the site and represent existing soil disturbance. Training activities currently underway represent ongoing soil disturbances. Soil units vary within the proposed CLF Range but are predominantly various compositions of loam (i.e., silty, sandy, and clayey loams) (see Figure 3.6-1).

3.6.1.2 Erosion and Erosion Management

Topography at JBLM YTC varies from low plains and rolling hills to escarpment. Five basaltic ridges (anticlines) cross the Installation in a northwest-southeast orientation: Yakima Ridge, Umtanum Ridge, Manastash Ridge, the Saddle Mountains, and the Boylston Mountains. The ridges form rounded hills to mountains, with slopes varying from 8 to 60 percent. Steepest slopes occur along crests of ridges. Topography tends to be more rugged in the eastern portion of the Installation, along Corral Canyon, in Alkali Canyon, and along bluffs bordering the Columbia River. Steep escarpments occur along the western end of Selah Creek. Elevations vary from about 500 feet above sea level at the banks of the Columbia River to an elevation of 4,191 feet above sea level along Yakima Ridge in the southeast portion of JBLM YTC (U.S. Army, 2011). The majority of soils at JBLM YTC are highly erodible.

The ROI is characterized by low to moderate slopes, ranging from 0 to 15 percent slopes. The largest slopes occur near the proposed ROCA facility and parking staging area, as well as along the potential power feed route (i.e., 15 to 30 percent slopes) (see Figure 3.6-1).

As stated in Section 3.6.1.1, soil units within the proposed CLF Range are predominantly various compositions of loam (i.e., silty, sandy, and clayey loams). Soils with a greater silt and sand composition are typically more susceptible to erosion; soils with a greater clay composition have a greater resistance to erosion. The proposed CLF Range would be located almost entirely upon soils with high erosion potential. The ROCA facility and parking areas would be constructed on soils with moderate erosion potential. As discussed in Section 3.2.1.4, JBLM experiences low levels of precipitation due to its location in the rain shadow of the Cascade Mountains. Soils are more susceptible to wind erosion during months of low precipitation.



Source: USDA, NRCS. 2009; Yakima Training Center, 2011. Created by PHE, October 2012.

Figure 3.6-1. Soil Map Units within CLF Range

The Army controls and minimizes erosion through protocols established by the INRMP during construction and through the Environmental Division and Integrated Training Area Management program (ITAM) during training operations. ITAM is a program designed to provide stewardship and sustainable use of Army land. The ITAM program establishes a uniform land management program, elements of which include inventorying and monitoring land condition, integrating training requirements with land carrying capacity while training to standard, educating land users to minimize adverse impacts, and prioritizing and implementing rehabilitation and maintenance projects. ITAM funds are provided to support monitoring, maintenance, and rehabilitation of natural resources affected by training activities and to maintain military access to training lands.

3.6.2 ENVIRONMENTAL CONSEQUENCES

Impacts on geology, topography, and soils would be considered significant if:

- The landscape cannot be sustained for military training;
- Excessive soil loss impairs plant growth; or
- Federal, state, or local laws pertaining to this resource are violated.

3.6.2.1 No Action Alternative

Under the No Action Alternative, construction and operation of the CLF Range would not occur. Training would continue to be conducted on temporary training areas, and no impacts from soil loss or erosion would occur from construction and operation of a permanent CLF Range. Range 15 would continue to be employed as a tank gunnery range and impacts to soils would occur from continued operation of the Range.

3.6.2.2 Proposed Action Alternative

Construction

Overall impacts from range construction would be short term and minor. Soil impacts related to construction are loss, compaction, and mixing of soils in a manner that affects fertility and water infiltration. Factors that influence the intensity of these impacts are soil properties, such as erodibility and soil texture; however, slope, aspect, cover, land use, and precipitation can also influence the intensity of these impacts. Soil loss would occur at and around sites where permanent features are constructed. Impacts (loss and compaction) would occur as a result of equipment and materials being staged, operated, and installed at each site. Construction staging would occur in either a previously disturbed area frequently used for staging (i.e., Area 2 of Range 15), or the footprint of the gravel parking area required for the ROCA, and would not result in significant impacts. Some soil loss could occur at or near the construction of the ROCA, targetry, and maintenance roads, as well as during trenching for the installation of power and control lines.

The Proposed Action would disturb up to 45.2 acres of soils during construction. This includes 24.6 acres for the installation of targetry/objectives, approximately 5.8 acres for the construction of the ROCA facility and parking lot, approximately 9.5 acres for installation of fiber optic and electric cables to targetry and approximately 5.3 acres for installation of the potential power feed. The Proposed Action would utilize existing roads to the extent practical and create unimproved maintenance roads placed within each target disturbance area which would minimize overall disturbance to soils. The amount of soil lost during construction would not be significant, and impacts, with the exception of the new 5.8-acre ROCA area and maintenance roads, would be short term and minor.

There would be short-term soil erosion as a result of proposed construction. Vehicular and equipment traffic across unimproved roads would cause soil compaction and crusting, making soils more susceptible

to wind and water erosion. Soils near existing roads would also be temporarily disturbed and exposed during excavation to place the power feed (if generators are not used) and fiber-optic and electrical cable lines. Existing vegetation would be cleared to construct the ROCA facility, parking lot, targetry, and maintenance roads, exposing soils to potential wind and water erosion during rain events. Soils near the ROCA facility and parking lot are characterized by 15 to 30 percent slopes, and could experience temporary impacts during rain events. Targets and maintenance roads would be located primarily on soil textures comprised of silt loams, which are susceptible to erosion. Short-term, minor impacts from erosion could occur near the targetry and maintenance roads as a result of construction.

Increased wind erosion potential would increase during the driest months on JBLM YTC (typically during June to September), as soils would become drier and more susceptible to wind erosion. Conversely, the wettest months of the year (typically during October to May) would increase potential for stormwater runoff near areas of increased impervious surface (ROCA facility, parking lot). As construction is anticipated to take one year, BMPs would particularly need to be implemented during these times.

Final repair and seeding would mitigate temporary erosional issues from construction and overall impacts from construction on soil erosion would be short term and minor. Appropriate BMPs specified in the CSWPPP would be implemented to control water runoff and erosion and establish permanent vegetation cover through seeding specifications. Vegetative stabilization would be compatible with arid or semi-arid regions (e.g., degradable rolled erosion control products) with an appropriate seed base to provide erosion control for achieving 70 percent original plant community cover within three years. Non-vegetative stabilization, as applicable, would be implemented following construction in areas of more frequent disturbance such as targetry maintenance roads. This would include products such as soil stabilizers, riprap, rolled erosion control products, resins, and block systems to achieve stabilization. Range construction would require compliance with NPDES and may require a site-specific Erosion Control Management Plan, or equivalent. JBLM YTC Public Works-Environmental Division/Range Operations would make final approval regarding the results (success) of stabilization mechanisms implementation before the contractor has satisfied contractual requirements.

Operations

Overall impacts from range operations would be negligible to minor. Operational impacts to soils would occur from recurring use of the site and through routine maintenance activities. Impacts would occur from Soldiers accessing the sites during training events and from staff accessing the area to conduct routine maintenance. The CLF Convoy would utilize existing improved roads on the range to the extent practical, which would minimize soil disturbance and erosion from vehicle maneuvers. CLF training only utilizes small arms calibers (i.e., up to .50 CAL). Firing of these munitions is not expected to generate significant soil loss or areas of increased erosion potential; however, fires that could start as a result of tracer munitions would result in increased erosion at sites where the vegetative cover is removed by fire.

Increased impervious surface area (i.e., the ROCA facility) and semi pervious surface area (i.e., the gravel parking lot) would increase stormwater runoff potential onto adjacent soils. Soils near the 5.8-acre ROCA facility and parking lot site are characterized by 15 to 30 percent slopes, and could experience long term minor soil erosion impacts as a result of operations.

Long-term minor soil erosion impacts could also occur at and near the maintenance roads. These roads would be unimproved, subject to trampling, and periodically cleared of vegetation so as to maintain access to targetry for maintenance purposes, making them vulnerable to wind and water erosion. If unimproved maintenance roads are not able to meet permit requirements, they would need to be stabilized with a permanent cover.

The new CLF Range would be managed according to the INRMP, and adjacent maneuver training lands will be managed and repaired as necessary due to training impacts. This would include range maintenance programs targeted to address long-term erosion due to operations of the proposed CLF Range. Erosional areas would be managed under INRMP land management principles and would be stabilized similar to those measures described for construction stabilization. Operational adverse impacts to soil resources, would therefore, be reduced to negligible.

3.6.3 CUMULATIVE EFFECTS

Overall cumulative adverse impacts would be less than significant. Cumulative impacts as a result of soil erosion could occur on the Installation when considering the past, present, and reasonably foreseeable projects listed in Table 3.1-2. Additional range construction and training on JBLM YTC resulting from GTA as well as CAB Stationing actions resulted in the potential for significant affects which were mitigated to less than significant. While the construction impacts associated with the proposed CLF Range are finite and short term in nature, the chronic (recurring) impacts associated with the operation of the range would have the potential for cumulative significance in combination with GTA and CAB actions. The cumulative increased training at JBLM YTC associated with GTA and CAB Stationing activities would also increase the potential for wildland fires. The loss of protective vegetative cover in burned areas could cause a cumulative increase in erosion potential. The additional site dip ponds, however, would provide the ability to suppress wildland fire and wildland fire spread, further reducing the potential for adverse impacts to soil resources. Additionally, the Proposed Action is wholly located within the footprint of an existing range that would help offset any new impacts caused by the operation of the proposed new CLF Range. Moderate cumulative impacts to soils, therefore, would be anticipated on the Installation when considered with the Proposed Action.

In addition, the proposed WAARNG TUAS would require a power feed from the existing ROCA area to its proposed location along the Selah Airstrip. The proposed power feed route would likely overlap portions of its alignment with the potential power feed proposed for the CLF Range. Overall, anticipated soil impacts during construction between these two projects for the potential power feeds would likely be reduced. Depending upon the timing of construction of these projects, the power feed would tap into the closest available connection point.

3.6.4 PROPOSED IMPACT REDUCTION MEASURES

BMPs specified in the Installation's CNRMP and the operator's CSWPPP would be implemented to control water runoff and erosion and establish permanent vegetation cover through seeding and re-establishment of desirable vegetative cover at sites disturbed during construction to 70 percent of pre-disturbance cover levels. Ongoing stewardship goals would be directed toward maintaining a desirable vegetative cover to minimize bare soil condition sites; limiting bare ground to areas in and around targetry, and other improved sites such as parking areas in and around the ROCA. Range construction would require compliance with the NPDES permit and may require a site-specific Erosion Control Management Plan, or equivalent.

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3.7 Wildland Fire

3.7.1 AFFECTED ENVIRONMENT

3.7.1.1 Wildland Fire Overview and Sources of Fire Starts

JBLM YTC is susceptible to wildland fire associated with military training and other human induced and natural caused fires. Certain aspects of military training, including CLF training, cause the unavoidable hazard of wildland fire, especially during the fire danger season (15 May through 30 September). JBLM YTC has policies and procedures in place to reduce or mitigate the potential hazard. Such policies include the IWFMP, Firebreak Maintenance Plan, Prescribed Burn Plan Procedures, and Pre-Incident Plans (see Section 3.7.1.2 for additional information regarding wildland fire management).

The frequency, intensity, and type of military training directly influence the potential for wildland fires at JBLM YTC. Both ground and air-based (e.g., helicopters) training activities are major contributors of fires on the Installation. These activities include the use of explosives, aspects of maneuver training, CLF, and devices such as pyrotechnics and tracers. JBLM YTC has established initiatives to reduce the likelihood of fire ignition including pyrotechnic restrictions during periods of high fire danger (JBLM YTC, 2012). The designated area for the permanent CLF Range would be located within Range 15 of TA 12, which is currently used as a tank gunnery range and temporary CLF Range. Due to previous training activities involved in tank gunnery and CLF training, the area is heavily impacted from a history of repeat wildland fires.

Weather conditions (both seasonal and current) such as low humidity, high temperatures, and wind speeds influence wildland fires at JBLM YTC. Conditions in the mid-afternoon to evening are the most favorable to the ignition of wildland fires due to peak conditions for ignitability. The regional climate is conducive to wildland fires as it is generally hot and dry in the summer and cool in the winter. Additionally, the region receives low amounts of precipitation, with the most accumulating in the winter. See Section 3.2 for further details about the regional climate.

Location of ignition point at JBLM YTC is of particular importance due to terrain, vegetation, and fuel loading. JBLM YTC is located in an area of open, shrub-steppe rolling hills and flats with bands of trees and shrubs centralized along creeks and in the bottoms of canyons. The shrub-steppe plant communities at JBLM YTC consist of fuel types ranging from 1- to 10-hour fuels[3]. These light fuels[4] are easily ignited and burn rapidly due to their small diameter (less than 0.5 inches) (JBLM YTC, 2012). Consequently, fire spreads rapidly and can consume extensive areas of land.

Sagebrush is the dominant overstory shrub at JBLM YTC and is extremely intolerant of fire. Reaching heights of two to six feet, sagebrush is a slow-growing species and is extremely susceptible to the effects of fire. The plant will likely die even if it is not completely burned or merely receives excessive heat from wildland fires. Once sagebrush is lost due to fire, reestablishment can take long periods of time (i.e., 30 to 100 years). JBLM YTC has two types of understory grassland communities that are susceptible to

[3] Fuel types are classified into four categories by which they respond to changes in moisture. Examples of 1-hour fuels are grass, leaves, and mulch which have fuel moistures that can change within one hour according to factors such as temperature, rain, humidity, and shade. Large diameter fuels (i.e., large branches, logs, and stumps) take up to 1,000 hours to respond to changes in the environment. The four categories are:

- 1-hour fuels: up to 0.25 inch in diameter
- 10-hour fuels: 0.25 inch to 1 inch in diameter
- 100-hour fuels: 1 inch to 3 inches in diameter
- 1,000-hour fuels: 3 inches to 8 inches in diameter

Source: Stevens, 2004.

[4] Fuels are also classified by size including light, medium, or heavy. Light fuels include short grasses and light brush up to 2 feet that burn rapidly (GeoSTAC, 2012).

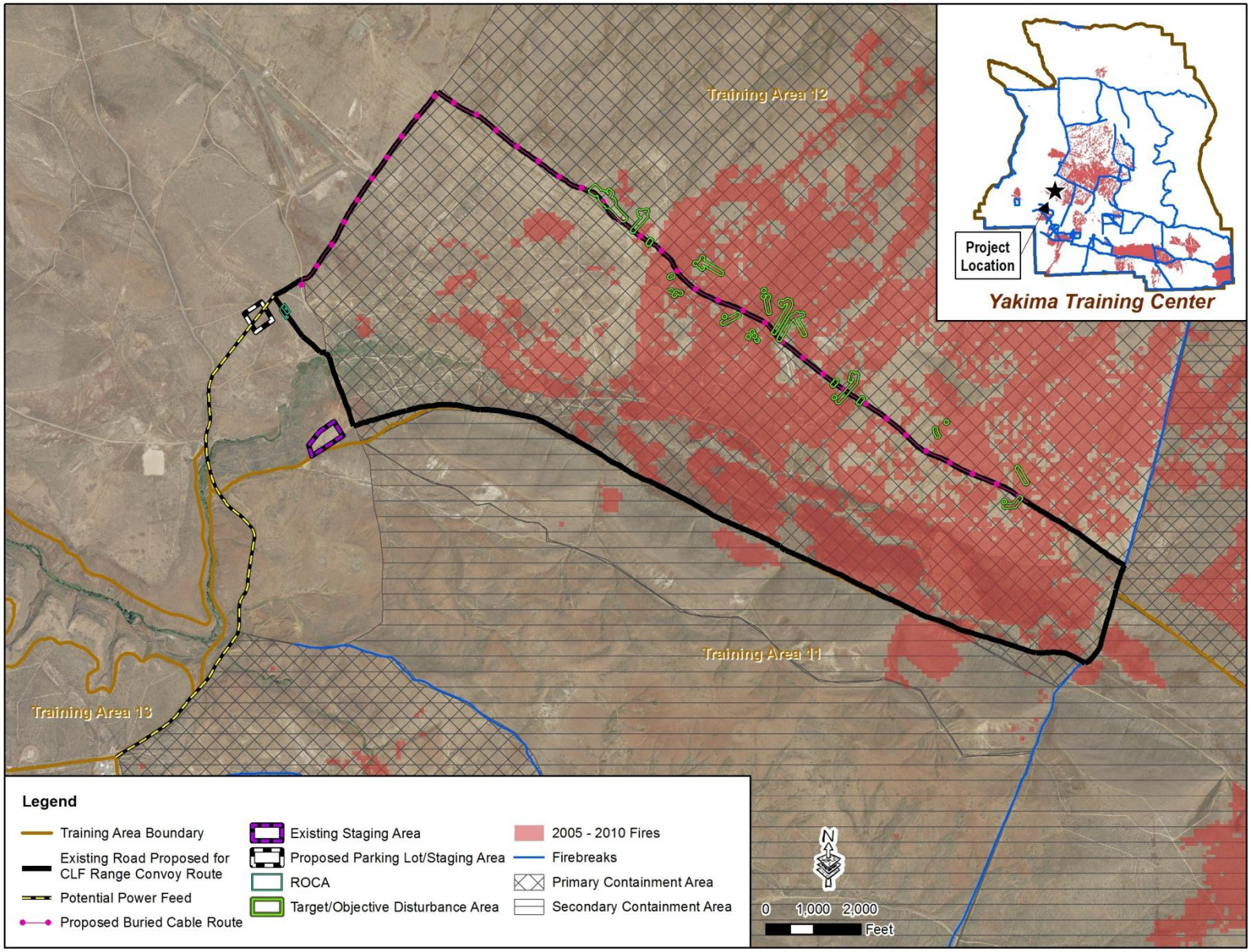
wildland fires: desirable (native and non-native) bunchgrasses and non-native annuals. Non-native annuals are the most flammable but for both grassland communities, fire suppression is generally more successful here than in shrub communities. In areas of higher disturbance, the native vegetative communities have been mostly replaced by exotic non-native species that are extremely flammable such as cheatgrass (JBLM YTC, 2012). As depicted in Figure 3.4-1, the area proposed for the targetry is mostly bunchgrass including bluebunch wheatgrass. Refer to Section 3.4, Biological Resources for additional details about vegetation at JBLM YTC.

Wildland fires have burned an average of approximately 9,000 acres annually for the past 25 years at JBLM YTC (U.S. Army, 2010). Between 1987 – 2000, 87,877 acres (26 percent) of the Installation was impacted by fire. In 1996, a fire escaped from the Central Impact Area and Multi-Purpose Range Complex and burned 48,234 acres within the Installation and an approximate 15,000 acres off-Installation. JBLM YTC had a marked decline in wildland fire between 1996 and 2003, due to enhancements in fire management policy and support, including implementation of Prescribed Burn Plans, enhanced weather monitoring, and implementation of the Fire Risk Assessment (U.S. Army, 2002). Even with improvements in fire management techniques, the increase in military training since 2009 caused a substantial rise in wildland fires at the Installation. Table 3.7-1 depicts the number of fires and acreages burned at the JBLM YTC due to wildland fires in recent years. Figure 3.7-1 shows the wildland fire history at JBLM YTC from 2005-2010 and existing firebreaks.

Table 3.7-1. Wildland Fire History for JBLM YTC

Year	Number of Fires	Acres Burned
2005[1]	19	1,500
2006	38	3,800
2007	45	2,500
2008[2]	49	5,400
2009[3]	187	10,137
2010	216	10,508
2011	865	3,197

[1]JBLM YTC had decreased military training in 2005.
[2]Increase in wildland fire acres burned attributed to a dry and long summer.
[3]JBLM YTC had an increase in military training starting in 2009.
Source: JBLM YTC, 2012.



Source: U.S. Department of Agriculture, 2011; Yakima Training Center, 2011. Created by PHE, October 2012.

Figure 3.7-1. JBLM YTC Fire History and Firebreaks

3.7.1.2 Wildland Fire Management

3.7.1.2.1 Risk Assessment and Management

JBLM YTC manages wildland fires with a variety of risk management techniques including:

Fire Matrix. JBLM YTC uses a Fire Matrix to evaluate the risks of starting wildland fires due to training activities during the fire danger season (15 May through 30 September). The matrix assigns predetermined values for risk factors and relies on the daily fire danger rating calculated from the National Fire Danger Rating System (NFDRS). The NFDRS is a model that considers the effects of weather, fuels (type, load, moisture), and topography to calculate daily ratings (e.g., Extreme, Very High, High, Moderate, and Low) (JBLM YTC, 2012). The JBLM YTC Fire Matrix is conducted throughout the day as fire danger conditions change to determine what training activity would be allowed to occur.

Weather Station Data. The NFDRS and Fire Matrix incorporate meteorological data from an automated weather station located near Range Operations. Daily climatic and fuel conditions are evaluated to determine how readily a fire would ignite and carry through the area. Parameters that are closely monitored include hourly temperature, relative humidity, and wind speed and direction. Additionally, the flammability of fuels is monitored using other parameters such as fuel moisture, fuel temperature, and solar radiation.

Firebreak Networks. The firebreak network at JBLM YTC provides compartmentalization within primary and secondary containment areas (used to minimize the possibility of the fire escaping) where fire hazards are the highest, and in other strategic locations such as the Installation boundary. JBLM YTC manages the network with a Firebreak Management Plan and annual maintenance of the network. Inspections and monitoring determine annual maintenance activities which include both mechanical and chemical (herbicide) maintenance. As a result of the *Fort Lewis Army Growth and Force Structure Realignment EIS*, the Installation evaluated the existing firebreak network during the fall/winter of 2009/2010. Consequently, 42 miles of additional firebreaks were added to help reduce wildland fire risks (JBLM YTC, 2012). Firebreaks also provide access for suppression teams into remote areas and are used as anchor points for suppression activities.

Annual Prescribed Burns. JBLM YTC developed an annual prescribed burn plan to identify areas where fires recur due to training activities and the areas where the potential of fire escape is highest. Areas where pre-burning typically occurs include target areas associated with ranges, and fortification of firebreaks or roads that surround impact areas and ranges. Prescribed burn plans are thoroughly documented and implemented in late spring through late summer/early fall. Two types of prescribed burns are used at JBLM YTC, including:

- Burnout or blackout, which is a block treatment applied to polygons ranging from approximately 1 to 100 acres located in and around targetry and other small areas with high ignition potential; and
- Black lining, which is typically used along existing roads or trails to act as a fuel break to compartmentalize or limit the spread of potential fires (JBLM YTC, 2012).

In some cases, prescribed burning is combined with impromptu fires. This can occur when fires move into areas where suppression is particularly difficult and in areas where fires are expected to recur.

Pre-incident Planning. Pre-incident planning identifies pre-suppression and suppression actions to reduce risks of wildland fires. Planning includes the consideration of fire history, fuel modeling, fire risk, fire behavior, land use and types of training, primary and secondary containment areas, fire-exclusion areas, prescribed burns, pre-stationing and access to suppression assets (i.e., water) (JBLM YTC, 2012).

3.7.1.2.2 Wildland Fire Management Resources

Wildland fires at JBLM YTC are impacted by the ability of fire suppression and response resources to effectively combat and contain fires quickly. Resources include personnel, equipment, prepositioning, reporting and response procedures, and pre-incident planning.

The Installation Commander has overarching responsibility for wildland fire management at JBLM YTC. Additional support for fire management is provided by the Directorate of Plans, Training, Mobility, and Security, the Directorate of Public Works (DPW), and the Directorate of Emergency Services (Fire Department) (JBLM YTC, 2012).

Personnel available for wildland fire suppression come from four sources: JBLM YTC Fire Department, military training units, qualified JBLM YTC civilian staff, and Mutual Aid from local fire service districts (JBLM YTC, 2012). The JBLM YTC Fire Department provides full time and seasonal staff dedicated to fire suppression activities. Additionally, they provide command and control assets for all supporting fire suppression teams. Military units are a second line of defense and include personnel assigned as stand-by fire suppression crews while their units conduct training activities. Other qualified civilian personnel and Mutual Aid fire departments are used when additional ground resources are needed for emergency operations. Currently, the Installation can request support from over 20 fire districts for Mutual Aid assistance (JBLM YTC, 2012).

Prepositioning techniques are an effective fire prevention measure used at JBLM YTC. Placing heavy equipment and suppression teams in strategic locations based on location and type of training has proven to be a successful method to suppress and contain fires by reducing response times. Prepositioning is practiced during current CLF training at JBLM YTC.

Availability of water is essential to properly support wildland fire suppression. Water for fire suppression comes from ground and surface water sources and includes 7 aerial dip ponds (5 permanent ponds and 2 temporary heliwells) and 25 ground refill points. Ground refill points have been added in many areas to reduce the travel time to one hour or less for refilling for ground assets. Recent analysis concluded that 12 additional storage and dip tank facilities are needed at JBLM YTC. The additions are subject to funding but are planned to be phased over a 6 year period beginning in FY12 as part of mitigation measures identified in the GTA EIS (JBLM YTC, 2012). Currently, there is a portable 10,000 gallon heliwell functioning as an aerial fire suppression water source at Range 15 until the GTA EIS mitigation measure of a 50,000 gallon permanent dip tank is established.

The JBLM YTC Fire Department maintains and operates the primary wildland fire suppression equipment which includes one tender, brush trucks with tanks ranging in size from 200 to 1,000 gallons, fire buckets (660 – 2,000 gallons), and miscellaneous fire suppression equipment to support Military suppression crews. The JBLM YTC DPW provides additional equipment available for suppression activities including tractors, lowboy trailers (20 - 40 ton), dump trucks (10 – 20 ton), and dozers (JBLM YTC, 2012). Aerial equipment is used to conduct both suppression and prevention activities at JBLM YTC. Support is provided by contractors due to limited availability of Military helicopters as a result of the Global War on Terrorism. A Type 1 helicopter equipped with a fire bucket is used on high priority fires, in steep and rugged terrain, and within impact areas. Commercial aerial applicators are used to perform herbicide firebreak maintenance applications (JBLM YTC, 2012).

3.7.2 ENVIRONMENTAL CONSEQUENCES

Impacts of the Proposed Action to wildland fire management would be considered significant if it increases the wildland fire risk or adversely impacts the ability of JBLM YTC to manage wildland fires.

3.7.2.1 No Action Alternative

Selecting the No Action Alternative would result in no discernible increases in the frequency or intensity of wildland fire. No construction would be undertaken, and JBLM YTC would continue to utilize temporary ranges for CLF training. Since no new CLF Range would be established, the likelihood and frequency of wildland fires would remain unchanged when compared to existing conditions.

3.7.2.2 Proposed Action Alternative

3.7.2.2.1 Impacts to Fire Start Potential

Construction

Construction activities are not expected to increase the fire start potential at JBLM YTC beyond a short term and negligible impact. Construction of the CLF Range would temporarily increase personnel presence, vehicle and equipment use, and activity at the construction sites. The increase in construction activities would have the potential to ignite fires due to engines (i.e., hot engines, ignitable engine leaks, etc.) near flammable vegetation. Risks would be reduced by placing construction equipment in designated storage and parking areas away from flammable sources.

Operations

Overall impacts from range operations would be less than significant. Fire start potential would increase within the designated project area due to additional frequency of training as compared to its previous use as a tank gunnery range and temporary CLF Range. The proposed CLF Range is expected to be used approximately 242 days per year but, Installation-wide, the frequency of CLF training would remain consistent with current conditions. Since the existing use of Range 15 as a tank gunnery range supports firing of both small and large caliber weapon systems, it would easily accommodate the small arms calibers (i.e., up to .50 CAL) used in CLF training and the potential use of pyrotechnics or tracer rounds. Use of pyrotechnics would be restricted during periods of high fire danger. Additional restrictions would be considered based on the Fire Matrix and analysis of weather and fuel conditions from data output of the Installation's weather station. The Range has a history of repeat wildland fires from the tank gunnery and temporary CLF operations, therefore, proposed CLF Range operations would generally coincide with historical patterns of use and incendiary occurrences.

Analysis found that most fires (over 90 percent) start and are contained within established range areas (U.S. Army, 2010). The risk of wildland fires also depends on many other factors including weather conditions, location of ignition, and fuel loads. The vegetation in Range 15 of TA 12 is consistent with vegetation present across the Installation which is dominated by light fuels including sagebrush that ignites easily and spreads fire rapidly. In areas of recurring fires, a permanent conversion of plant communities could potentially occur. Native sagebrush and grassland species are often replaced by invasive species such as cheatgrass, which is highly flammable. As a preventative measure, prescribed burns would be implemented in areas where fires frequently recur. The area designated for the CLF Range is already heavily impacted by past training activities but the potential wildland fires associated with CLF training could continue to damage the remaining sagebrush and grassland communities, including the younger sagebrush plants that take many years to grow. In addition to wildland fire having the potential to damage vegetative and animal species present at the CLF Range, it could also move off post if not properly contained and would have the potential to damage surrounding homes and community resources. Pre-incident planning for the new CLF Range would consider the potential for wildland fires to move off JBLM YTC and impact nearby sensitive receptors. The pre-incident plans would be used to prioritize and implement prevention and suppression actions to reduce the potential risk of wildland fires spreading on JBLM YTC and moving off post.

The site within Range 15 of TA 12 has been extensively altered by past training exercises and allows for the use of existing wildland fire protection features, such as existing firebreaks, containment area boundaries, and suppression resources, which would help to suppress and combat fires due to CLF training. The CLF Range would be located in a portion of TA 12 that falls within a primary fire containment area. The new Range would be contained by firebreaks situated to the east and west and along the border of the central impact area to the north. If training activities (such as CLF training) increase in the future, JBLM YTC should evaluate the need for additional firebreaks.

Although training at the CLF Range would potentially cause an increase in wildland fire ignition within the designated project footprint and potentially impact vegetation, the impacts are consistent with existing training activities on temporary ranges within JBLM YTC. The wildland fire risk assessment and management measures would be used to reduce fire start potential and the impact on vegetation within the CLF Range to negligible levels.

3.7.2.2.2 Impacts to Wildland Fire Management

Construction

Construction of the CLF Range would require pre-incident plans, firebreaks, and other essential wildland fire management procedures as part of construction management plans. No impacts to wildland fire management are anticipated due to CLF Range construction.

Operations

Operation of the new CLF Range would have negligible impacts to wildland fire management. Existing measures to minimize wildland fire risk and suppress fire are already in place under the JBLM YTC IWFMP. Since the Proposed Action would create a permanent range for CLF training, the Installation would be better prepared to manage such risks, providing a beneficial impact for wildland fire management. Replacing the temporary CLF Ranges with a permanent location would create a defined area to focus management and planning efforts which would allow the Installation to institute range-specific plans to manage wildland fire risks of the new CLF Range. Installation management personnel have the experience and wildland fire history reports to review and use as guides when preparing fire management plans.

3.7.3 CUMULATIVE EFFECTS

Overall cumulative adverse impacts would be less than significant. There has been a substantial increase in fire starts at the Installation since 2009, due to additions of new training ranges and GTA actions; but, the construction and operation of a CLF Range would not likely contribute to significant cumulative effects associated with wildland fire. The Proposed Action would re-direct CLF training to a specially-designed permanent CLF Range, which is not anticipated to increase the amount of CLF training. Therefore, although the frequency of wildland fires has increased substantially since 2009, the proposed CLF Range would not likely contribute significantly to the current increasing trend in fire starts as a result of GTA and CAB stationing actions.

3.7.4 PROPOSED IMPACT REDUCTION MEASURES

No significant impacts to the frequency, intensity, or size wildland fire are anticipated from implementation of the Proposed Action. Adverse impacts would be reduced through existing IWFMP procedures. A review and potential expansion of primary and secondary containment areas on adjacent land would be performed and pre-incident wildland fire plans specifically for the new CLF Range would be developed. In addition, firebreak maintenance would continue for compartmentalizing potential fires due to the CLF Range restrictions on the use of pyrotechnics on high fire danger days, and prescribed burns would be performed in areas where fires frequently recur. Existing mitigation associated with the 2011 Fort Lewis GTA action includes a requirement for the development of 12 additional storage and dip

pond facilities across JBLM YTC. When complete, the dip ponds would provide additional ability to suppress wildland fire and wildland fire spread, and would help mitigate wildland fire threats from training activities at the new CLF Range.

4. SUMMARY OF ENVIRONMENTAL CONSEQUENCES

This section summarizes the anticipated level of impact to the VECs under the No Action and Proposed Action alternatives as discussed in Chapter 3. Table 4-1 also outlines measures identified in Chapter 3 for the Proposed Action to reduce and avoid adverse effects.

Table 4-1. Summary of Potential Environmental Effects from Baseline Conditions

Activity	No Action	Proposed Action	Cumulative Impact	Permits, Plans, and Measures Identified for Reduction of Adverse Impacts
Air Quality and Greenhouse Gas				
Construction	No Impact	Less than significant impact	Less than significant impact	• Prior to construction, the contractor would contact the YRCAA to determine the requirements for a Dust Control Plan and appropriate dust control measures. If dust might pose a nuisance or be a detriment to health or safety, preventive measures would be outlined in the Dust Control Plan and implemented by the contractor to prevent airborne dust during construction. • If temporary generators are used for construction, the contractor would contact the YRCAA concerning possible submittal of a Notice of Establishment of Temporary Portable Sources and provide YTC Public Works-Environmental Division with a copy of the notice.
Operations	No Impact	Less than significant impact		• The control of smoke would be handled by smoke management techniques per the IWFMP to meet regulatory and burn permit requirements and to determine the appropriate timing of prescribed fires and firebreak management. • If the Proposed Action pursues the use of the two generators to power the proposed CLF Range, JBLM YTC would coordinate with WDOE and YRCAA to determine potential permitting or regulatory requirements.
Water Resources				
Construction	No Impact	Less than significant impact	Less than significant impact	• To prevent water quality deterioration, all temporary construction-related footprint disturbances would be revegetated with appropriate plant species. • Unnamed intermittent upland tributary drainages disturbed during trenching and underground utility operations would be restored to their original grades following construction. • A NPDES General Permit would be required prior to construction activities. • To minimize impacts to surface water resources, the CSWPPP would be adhered to and would provide protection by ensuring contracts contain language requiring site operators to obtain a NPDES permit and develop a site-specific CSWPPP. The site-specific CSWPPP plan would include BMPs for erosion control and pollution prevention requirements.

Table 4-1. Summary of Potential Environmental Effects from Baseline Conditions

Activity	No Action	Proposed Action	Cumulative Impact	Permits, Plans, and Measures Identified for Reduction of Adverse Impacts
Operations	No Impact	Less than significant impact		• Existing mitigation associated with the 2011 Fort Lewis GTA action includes a requirement for the development of 12 additional storage and dip pond facilities across JBLM YTC. This would help mitigate the increase wildland fire potential due to the new CLF and would further reduce the potential for adverse impacts of wildland fire spread and sediment entering Selah Creek as fires would be suppressed more rapidly. • If necessary, stormwater runoff from the 5.8-acre ROCA area would be managed through site design, including the creation of upland release points.
Biological Resources				
Construction	No Impact	Less than significant impact	Less than significant impact	• Temporary construction-related footprint disturbances would be revegetated with appropriate species. Ground cover revegetation would occur on-site at a 1:1 ratio (up to 32.7 acres disturbed, requiring up to 32.7 acres revegetated) and disturbances to shrub-steppe vegetation (sage-grouse habitat) would be mitigated through off-site restoration at a 3:1 ratio (up to 12.0 acres disturbed, requiring up to 36.0 acres restored). These measures would also serve to reduce the spread of noxious weeds; however, noxious weed management may be necessary to prevent the spread of invasive species in disturbed sites. • In order to further reduce the potential for disturbance to species protected under the MBTA, ground-clearing activities, to the greatest extent possible, would be conducted outside the nesting season (February to August). If ground clearing activities are conducted within the nesting season, the amount of ground clearing activities would be minimized to the greatest extend practical.
Operations	No Impact	Less than significant impact		• Existing mitigation associated with the 2011 Fort Lewis GTA action includes a requirement for the development of 12 additional storage and dip pond facilities across JBLM YTC. This mitigation would further reduce the potential for adverse impacts of wildland fire spread to biological resources as fires would be suppressed more rapidly. • Protection of newly discovered active leks outside current Sage-grouse Protection Area would be assessed on a case by case basis and may include protective measures outlined in the Sage-grouse Management Plan, which establishes a 1 kilometer protection radius from active lek areas. • To reduce the probability of take, JBLM YTC would, to the greatest extent possible, conduct maintenance activities outside of the MBTA nesting season (February to August).

Table 4-1. Summary of Potential Environmental Effects from Baseline Conditions

Activity	No Action	Proposed Action	Cumulative Impact	Permits, Plans, and Measures Identified for Reduction of Adverse Impacts
Cultural Resources				
Construction	No Impact	Less than significant impact	No Impact	• Necessary surveys regarding TCPs, Sacred Sites, and ACNAUs would be conducted prior to construction and identified resources would be managed according to the ICRMP.
Operations	No Impact	Less than significant impact		• Any identified resources would be managed according to the ICRMP during operations of the proposed CLF Range.
Soil Resources				
Construction	No Impact	Less than significant impact	Less than significant impact	• BMPs specified in the Installation's Cultural and Natural Resources Management Plan and the operator's CSWPPP would be implemented to control water runoff and erosion and establish permanent vegetation cover through seeding and re-establishment of desirable vegetative cover at sites disturbed during construction to 70 percent of pre-disturbance cover levels. • Range construction would require compliance with the NPDES permit and may require a site-specific Erosion Control Management Plan, or equivalent.
Operations	No Impact	Less than significant impact		• Ongoing land management would maintain a desirable vegetative cover to minimize bare soil condition sites; limiting exposed soils to areas in and around targetry, and other improved sites, such as parking areas in and around the ROCA.
Wildland Fire				
Construction	No Impact	Less than significant impact	Less than significant impact	• Construction of the CLF Range would require pre-incident plans, firebreaks, and other essential wildland fire management procedures as part of construction management plans.
Operations	No Impact	Less than significant impact		• Impacts would be reduced through existing Integrated Wildland Fire Management Plan procedures, including the review and potential expansion of primary and secondary containment areas on adjacent land; developing pre-incident wildland fire plans specifically for the new CLF Range; firebreak maintenance to adequately compartmentalize potential fires due to the CLF Range; restrictions on the use of pyrotechnics on high fire danger days; and prescribed burns in areas where fires frequently recur. • Existing mitigation associated with the 2011 Fort Lewis GTA action includes a requirement for the development of 12 additional storage and dip pond facilities across JBLM YTC would help mitigate wildland fire due to the new CLF Range.

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5. LIST OF ACRONYMS

Acronym	Definition
˚F	degrees Fahrenheit
ACNAU	Area of Contemporary Native American Use
APE	Area of Potential Effects
AQCR	Air Quality Control Region
AR	Army Regulation
ARTR/PSSP	big sagebrush/Bluebunch wheat grass vegetation classification
ARTR[PUTR]/PSSP	big sagebrush[antelope bitterbrush]/bluebunch wheat grass vegetation classification
ARRI/POSE	stiff sagebrush/Sandberg‘s bluegrass vegetation classification
ARTR/POSE	big sagebrush/Sandberg‘s bluegrass vegetation classification
ARTRP/FEID	threetip sagebrush/Idaho fescue vegetation classification
ARTRP-ARTR/PSSP	threetip sagebrush – big sagebrush/bluebunch wheat grass vegetation classification
BGEPA	Bald and Golden Eagle Protection Act
BMP	Best Management Practice
CAA	Clean Air Act
CAB	Combat Aviation Brigade
CACTF	Combined Arms Collective Training Facility
CAL	Caliber
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CLF	Convoy Life Fire
CNRMP	Cultural and Natural Resources Management Plan
CO	carbon monoxide
CO_2	Carbon dioxide
CSWPPP	Construction Storm Water Pollution Prevention Plan
CWA	Clean Water Act
DA	Department of the Army
DoD	Department of Defense
DPS	Distinct Population Segment
DPW	Directorate of Public Works
EA	Environmental Assessment
ECP	Entry Control Point
EIS	Environmental Impact Statement
EO	Executive Order
ESA	Endangered Species Act
ESU	Evolutionarily Significant Unit

Acronym	Definition
ERTH/POSE	thymeleaf buckwheat/Sandberg‘s bluegrass vegetation classification
FEMA	Federal Emergency Management Agency
FNSI	Finding of No Significant Impact
FY	Fiscal Year
G-3	Chief of Staff, Operations and Plans
GHG	greenhouse gases
GTA	Grow the Army
HAST/POSE	goldenweed/Sandberg‘s bluegrass vegetation classification
HAST/PSSP	goldenweed/bluebunch wheat grass vegetation classification
ICRMP	Integrated Cultural Resources Management Plan
IED	Improvised Explosive Devices
IPM	Integrated Pest Management
IPMP	Integrated Pest Management Plan
ITAM	Integrated Training Area Management
IWFMP	Integrated Wildland Fire Management Plan
JBLM YTC	Joint Base Lewis-McChord Yakima Training Center
kW	KiloWatt
MAT	Moving Armor Targets
MBTA	Migratory Bird Treaty Act
MIT	Moving Infantry Targets
MPMGR	Multi-Purpose Machine Gun Range
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NFDRS	National Fire Danger Rating System
NHPA	National Historic Preservation Act
NRHP	National Register of Historic Places
NOAA	National Oceanic and Atmospheric Administration
NO_x	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
O_3	ozone
PM_{10}	particulate matter of diameter 10 micrometers or less
$PM_{2.5}$	particulate matter of diameter 2.5 micrometers or less
ppm	parts per million
PTE	Potential to Emit
PSSP	bluebunch wheat grass vegetation classification
ROCA	Range Operations Control Area
ROI	Region of Influence
SAT	Stationary Armor Targets
SBCT	Stryker Brigade Combat Team

Acronym	Definition
SDZ	Surface Danger Zone
SFF	Sniper Field Fire
SIT	Stationary Infantry Targets
SME	Subject Matter Expert
SO_2	sulfur dioxide
SOP	Standard Operating Procedure
TA	Training Area
TC	Training Circular
TCP	Traditional Cultural Property
TMDL	Total Maximum Daily Load
tpy	tons per year
TUAS	Tactical Unmanned Aircraft System
UOV	Urban Operations Village
USACE	United States Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	United States Geological Survey
VEC	Valued Environmental Component
VOC	volatile organic compound
WAARNG	Washington Army National Guard
WDFW	Washington Department of Fish and Wildlife
WDOE	Washington Department of Ecology
YRCAA	Yakima Regional Clean Air Agency
$\mu g/m^3$	micrograms per cubic meter

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APPENDIX A

Status of Migratory Bird Species on JBLM YTC

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Status of Migratory Bird Species on JBLM YTC

This appendix provides tabular summaries of migratory birds known to occur at JBLM YTC. Table A-1 includes general habitat, residence, and breeding information. The table also describes the Federal and State status of migratory birds as determined by the U.S. Fish and Wildlife Service (USFWS) and the Washington Department of Fish and Wildlife (WDFW), and Partners in Flight (PIF) priority ranking status based on national population levels and trends. As reflected in the table, 169 species of birds have been documented on JBLM YTC. As stated within Section 3.4.2.2.1 of the EA, a total of 12.0 acres of big sagebrush/bluebunch wheatgrass and 32.7 acres of grassy habitat would be disturbed from construction activities; both of these habitats are characteristic of shrub-steppe habitat. Of these 169 species, a total of 36 (indicated by shaded rows) have listed as migratory species by the USFWS and have been known to breed on JBLM YTC within shrub-steppe habitat.

Table A-1. Habitat, Season of Residence or Occurrence, and Migratory Status of Birds Occurring on JBLM YTC

Scientific Name	Common Name	Habitat	Residence	Breeds on YTC	Listed as Migratory Species by USFWS	Status/ PIF Priority[1,2,a]
Accipiter cooperii	Cooper's hawk	Riparian	Summer	x	x	
Accipiter gentilis	Northern goshawk	Riparian	Migrant		x	SC/FC/IIc
Accipiter striatus	Sharp-shinned hawk	Riparian	Migrant		x	
Actitis macularius	Spotted sandpiper	Riparian	Summer		x	
Aechmophorus occidentalis	Western grebe	Riparian	Migrant		x	SC
Aegolius acadicus	Northern saw-whet owl	Riparian	Infrequent Migrant		x	
Aeronautes saxatalis	White-throated swift	Talus/Cliff and Shrub-Steppe	Summer	x	x	I
Agelaius phoeniceus	Red-winged blackbird	Riparian, Urban/Industrial	Summer	x	x	
Aix sponsa	Wood duck	Riparian	Summer		x	
Alectoris chukar	Chukar	Shrub-Steppe and Riparian	Permanent	x		
Ammodramus savannarum	Grasshopper sparrow	Shrub-steppe and Steppe Grasslands	Summer	x	x	IIc
Amphispiza belli	Sage sparrow	Shrub-steppe and Steppe Grasslands	Summer	x	x	SC/IIa
Anas acuta	Northern pintail	Riparian	Permanent		x	
Anas americana	American wigeon	Riparian	Permanent		x	
Anas clypeata	Northern Shoveler	Riparian	Migrant		x	
Anas crecca	Green-winged teal	Riparian	Summer		x	
Anas cyanoptera	Cinnamon teal	Riparian	Summer		x	
Anas discors	Blue-winged teal	Riparian	Migrant		x	
Anas platyrhynchos	Mallard	Riparian	Permanent	x	x	
Anas strepera	Gadwall	Riparian	Migrant		x	
Anthus rubescens	American pipit	Steppe and Riparian	Migrant		x	

Table A-1. Habitat, Season of Residence or Occurrence, and Migratory Status of Birds Occurring on JBLM YTC

Scientific Name	Common Name	Habitat	Residence	Breeds on YTC	Listed as Migratory Species by USFWS	Status/ PIF Priority[1,2,a]
Aquila chrysaetos	Golden eagle	Shrub-Steppe, Talus/Cliffs	Permanent	x	x	SC/IIa
Ardea herodias	Great blue heron	Riparian	Permanent		**x**	
Asio flammeus	Short-eared owl	Shrub-Steppe and Riparian	Permanent	**x**	**x**	I
Asio otus	Long-eared owl	Shrub-Steppe and Riparian	Permanent	**x**	**x**	
Athene cunicularia	Burrowing owl	Shrub-steppe and Steppe Grasslands	Summer	**x**	**x**	SC/FC
Aythya affinis	Lesser scaup	Riparian	Permanent		**x**	
Aythya americana	Redhead	Riparian	Summer		**x**	
Aythya collaris	Ring-necked duck	Riparian	Permanent		**x**	
Aythya marila	Greater scaup	Riparian	Winter		**x**	
Aythya valisineria	Canvasback	Riparian	Winter		**x**	
Bombycilla cedrorum	Cedar waxwing	Riparian	Migrant		**x**	
Bombycilla garrulus	Bohemian waxwing	Riparian	Undocumented		**x**	
Botaurus lentiginosus	American bittern	Riparian	Migrant		**x**	
Branta canadensis	Canada goose	Riparian	Permanent		**x**	
Bubo virginianus	Great-horned owl	All	Permanent	**x**	**x**	
Bucephala albeola	Bufflehead	Riparian	Winter		**x**	
Buteo jamaicensis	Red-tailed hawk	Shrub-Steppe and Riparian	Permanent	**x**	**x**	
Buteo lagopus	Rough-legged hawk	Shrub-steppe and Steppe Grasslands	Winter		**x**	
Buteo regalis	Ferruginous hawk	Shrub-Steppe, Talus/Cliffs	Summer	x	x	ST/FCo/IIa
Buteo swainsoni	Swainson's hawk	Shrub-Steppe and Riparian	Summer	**x**	**x**	I
Calcarius lapponicus	Lapland longspur	Shrub-steppe and Steppe Grasslands	Migrant		**x**	
Callipepla californica	California quail	Riparian	Permanent	**x**		IIa
Carduelis flammea	Common Redpoll	Riparian	Winter, Migrant		**x**	
Carduelis pinus	Pine Siskin	Riparian	Migrant		**x**	
Carduelis psaltria	Lesser goldfinch	Riparian	Accidental, Migrant		**x**	
Carduelis tristis	American goldfinch	Shrub-Steppe, Riparian, Urban/Industrial	Permanent	**x**	**x**	
Carpodacus mexicanus	House finch	Urban/Industrial	Permanent	**x**	**x**	

Table A-1. Habitat, Season of Residence or Occurrence, and Migratory Status of Birds Occurring on JBLM YTC

Scientific Name	Common Name	Habitat	Residence	Breeds on YTC	Listed as Migratory Species by USFWS	Status/ PIF Priority[1,2,a]
Carpodacus purpureus	Purple finch	Shrub-Steppe and Riparian	Winter		x	
Cathartes aura	Turkey vulture	All except Urban/Industrial	Summer, Peripheral		x	
Catharus guttatus	Hermit thrush		Migrant		x	
Catherpes mexicanus	Canyon wren	Talus/Cliff	Permanent	x	x	
Centrocercus urophasianus	Sage grouse	Shrub-Steppe	Permanent	x		ST/FC/I
Charadrius vociferus	Killdeer	Shrub-Steppe and Riparian	Summer	x	x	IIa
Chlidonias niger	Black tern	Riparian	Summer		x	
Chondestes grammacus	Lark sparrow	Shrub-steppe and Steppe Grasslands	Summer	x	x	
Chordeiles minor	Common nighthawk	Shrub-Steppe and Riparian	Summer	x	x	
Circus cyaneus	Northern harrier	Shrub-Steppe and Riparian	Permanent	x	x	IIa
Cistothorus palustris	Marsh Wren	Riparian	Migrant		x	
Coccothraustes vespertinus	Evening grosbeak	Riparian	Migrant		x	
Colaptes auratus	Northern flicker	Riparian, Urban/Industrial	Permanent	x	x	
Columba livia	Rock dove	Urban/Industrial	Permanent	x		
Contopus cooperi	Olive-sided flycatcher	Riparian	Migrant		x	I
Contopus sordidulus	Western Wood Pewee	Riparian	Migrant (summer?)		x	
Corvus brachyrhynchos	American crow	Riparian, Urban/Industrial	Peripheral		x	
Corvus corax	Common raven	All	Permanent	x	x	
Cygnus columbianus	Tundra Swan	Riparian	Migrant		x	
Dendroica coronata	Yellow-rumped warbler	Riparian	Winter, Migrant		x	
Dendroica petechia	Yellow warbler	Riparian, Urban/Industrial	Summer		x	
Dendroica townsendi	Townsend's Warbler	Riparian	Migrant		x	
Empidonax difficilis	Western Flycatcher	Riparian	Migrant		x	
Empidonax traillii	Willow flycatcher	Riparian	Migrant		x	I

Table A-1. Habitat, Season of Residence or Occurrence, and Migratory Status of Birds Occurring on JBLM YTC

Scientific Name	Common Name	Habitat	Residence	Breeds on YTC	Listed as Migratory Species by USFWS	Status/ PIF Priority[1,2,a]
Eremophila alpestris	Horned lark	Shrub-steppe and Steppe Grasslands	Permanent	**x**	**x**	
Euphagus cyanocephalus	Brewer's blackbird	Riparian, Urban/Industrial	Summer	**x**	**x**	
Falco columbarius	Merlin	All	Infrequent Migrant		x	SC
Falco mexicanus	Prairie falcon	Shrub-steppe, Riparian, Talus/Cliffs	Permanent	**x**	**x**	SC
Falco peregrinus	Peregrine falcon	Riparian	Infrequent Migrant		**x**	SS/FCo/IIa
Falco sparverius	American kestrel	All	Permanent	**x**	**x**	
Fulica americana	American coot	Riparian	Permanent		**x**	
Gallinago gallinago	Common snipe	Riparian	Summer	**x**	**x**	
Gavia immer	Common loon	Riparian	Peripheral	**a**	**x**	SS
Glaucidium gnoma	Northern Pygmy-Owl	Riparian	Winter, Migrant		**x**	
Grus Canadensis	Sandhill crane	Riparian	Infrequent Migrant		**x**	SE
Haliaeetus leucocephalus	Bald eagle	Riparian	Winter		**x**	SS/FCo
Hirundo rustica	Barn swallow	Riparian, Talus/Cliffs, Urban	Summer	**x**	**x**	
Hydroprogne caspia	Caspian tern	Riparian	Summer, Peripheral		**x**	
Icteria virens	Yellow-breasted Chat	Riparian	Summer	**x**	**x**	
Icterus bullockii	Bullock's Oriole	Riparian	Summer	**x**	**x**	
Ixoreus naevius	Varied thrush	Riparian, Urban/Industrial	Winter, Migrant		**x**	
Junco hyemalis	Dark-eyed junco	Shrub-Steppe and Riparian	Winter, Migrant		**x**	
Lanius excubitor	Northern shrike	Riparian	Winter		**x**	SC/FCo
Lanius ludovicianus	Loggerhead shrike	Shrub-Steppe and Riparian	Permanent	**x**	**x**	IIc
Larus californicus	California gull	Riparian	Permanent		**x**	
Larus delawarensis	Ring-billed gull	Riparian	Permanent		**x**	
Leucosticte tephrocotis	Gray-crowned rosy finch	Shrub-Steppe, Talus/Cliffs	Winter		**x**	
Lophodytes cucullatus	Hooded merganser	Riparian	Permanent		**x**	
Loxia curvirostra	Red Crossbill	Riparian	Winter, Migrant		**x**	

Table A-1. Habitat, Season of Residence or Occurrence, and Migratory Status of Birds Occurring on JBLM YTC

Scientific Name	Common Name	Habitat	Residence	Breeds on YTC	Listed as Migratory Species by USFWS	Status/ PIF Priority[1,2,a]
Megaceryle alcyon	Belted kingfisher	Riparian	Summer		x	
Megascops kennicottii	Western screech-owl		Undocumented		x	
Melanerpes lewis	Lewis' woodpecker	Riparian	Summer		x	SC
Melospiza georgiana	Swamp sparrow		Migrant		x	
Melospiza melodia	Song sparrow	Shrub-Steppe, Riparian, Urban/Industrial	Permanent	x	x	
Mergus merganser	Common merganser	Shrub-Steppe and Riparian	Summer		x	
Molothrus ater	Brown-headed cowbird	Shrub-Steppe, Riparian, Urban/Industrial	Summer	x	x	
Myadestes townsendi	Townsend's solitaire	Shrub-steppe and Steppe Grasslands	Winter, Migrant		x	IIa
Myiarchus cinerascens	Ash-throated flycatcher	Riparian	Summer		x	
Nucifraga columbiana	Clark's nutcracker		Migrant		x	
Numenius americanus	Long-billed curlew	Shrub-Steppe and Riparian	Summer	x	x	
Nycticorax nycticorax	Black-crowned night heron	Riparian	Peripheral		x	
Oporornis tolmiei	MacGillivray's warbler	Riparian	Migrant		x	IIa
Oreoscoptes montanus	Sage thrasher	Shrub-steppe and Steppe Grasslands	Summer	x	x	SC/IIa
Pandion haliaetus	Osprey	Riparian	Peripheral		x	
Passer domesticus	House sparrow	Urban/Industrial	Permanent	x		
Passerculus sandwichensis	Savannah sparrow	Shrub-Steppe and Riparian	Summer	x	x	
Passerella iliaca	Fox sparrow	Riparian	Migrant		x	
Passerina amoena	Lazuli bunting	Riparian	Summer	x	x	IIa
Pelecanus erythrorhynchos	American white pelican	Riparian	Permanent?		x	SE
Perdix perdix	Grey partridge	Shrub-Steppe	Permanent	x		
Petrochelidon pyrrhonota	Cliff swallow	Riparian, Talus/Cliffs	Summer	x	x	
Phalaenoptilus nuttallii	Common poorwill	Shrub-Steppe and Riparian	Summer	x	x	
Phasianus colchicus	Ring-necked pheasant	Riparian	Permanent	x		

Table A-1. Habitat, Season of Residence or Occurrence, and Migratory Status of Birds Occurring on JBLM YTC

Scientific Name	Common Name	Habitat	Residence	Breeds on YTC	Listed as Migratory Species by USFWS	Status/ PIF Priority[1,2,a]
Pheucticus melanocephalus	Black-headed grosbeak	Riparian	Summer		x	
Pica hudsonia	Black-billed magpie	All	Permanent	x	x	IIa
Picoides pubescens	Downy woodpecker	Riparian	Permanent	x	x	
Picoides villosus	Hairy woodpecker	Riparian, Urban/Industrial	Permanent		x	
Pipilo maculatus	Spotted Towhee	Shrub-Steppe, Riparian, Urban/Industrial	Permanent	x	x	
Piranga ludoviciana	Western tanager	Riparian	Migrant		x	
Plectrophenax nivalis	Snow Bunting	Shrub-Steppe, Talus/Cliffs	Winter		x	
Podiceps auritus	Horned grebe	Riparian	Migrant		x	
Podilymbus podiceps	Pied-billed grebe	Riparian	Permanent		x	
Poecile atricapillus	Black-capped chickadee	Riparian	Permanent	x	x	
Poecile gambeli	Mountain chickadee	Riparian	Winter		x	
Pooecetes gramineus	Vesper sparrow	Shrub-steppe and Steppe Grasslands	Summer	x	x	
Porzana carolina	Sora	Riparian	Summer	x	x	
Rallus limicola	Virginia rail	Riparian	Migrant	?	x	
Regulus calendula	Ruby-crowned kinglet	Riparian	Winter, Migrant		x	
Regulus satrapa	Golden-crowned kinglet	Riparian	Winter, Migrant.		x	
Riparia riparia	Bank swallow	Shrub-Steppe and Riparian	Summer	x	x	
Salpinctes obsoletus (IIa)	Rock wren	Talus/Cliff	Permanent	x	x	
Sayornis saya	Say's phoebe	Riparian, Urban/Industrial	Summer	x	x	
Selasphorus rufus	Rufous hummingbird	Riparian, Urban/Industrial	Summer		x	I
Setophaga ruticilla	American redstart		Accidental, Migrant		x	
Sialia currucoides	Mountain bluebird	Shrub-steppe and Steppe Grasslands	Winter, Migrant.		x	
Sialia mexicana	Western bluebird	Shrub-steppe and Steppe Grasslands	Peripheral		x	

Table A-1. Habitat, Season of Residence or Occurrence, and Migratory Status of Birds Occurring on JBLM YTC

Scientific Name	Common Name	Habitat	Residence	Breeds on YTC	Listed as Migratory Species by USFWS	Status/ PIF Priority[1,2,a]
Sitta canadensis	Red-breasted nuthatch	Riparian, Urban/Industrial	Winter, Migrant		x	
Spizella breweri	Brewer's sparrow	Shrub-steppe and Steppe Grasslands	Summer	x	x	I
Spizella passerina	Chipping Sparrow	Shrub-Steppe and Riparian	Migrant		x	
Stelgidopteryx serripennis	N. rough-winged swallow	Riparian, Talus/Cliffs, Urban	Summer	x	x	
Stellula calliope	Calliope hummingbird	Riparian	Migrant		x	I
Sterna forsteri	Forster's tern	Riparian	Summer, Peripheral		x	
Sturnella neglecta	Western meadowlark	Shrub-steppe and Steppe Grasslands	Summer	x	x	IIa
Sturnus vulgaris	European starling	Urban/Industrial	Permanent	x		
Tachycineta bicolor	Tree swallow	Riparian	Migrant		x	
Tachycineta thalassina	Violet-green swallow	Riparian, Talus/Cliffs, Urban	Summer	x	x	
Thryomanes bewickii	Bewick's wren	Shrub-Steppe and Riparian	Migrant		x	
Troglodytes aedon	House wren	Riparian, Urban/Industrial	Summer	x	x	
Turdus migratorius	American robin	Riparian, Urban/Industrial	Summer	x	x	
Tyrannus tyrannus	Eastern kingbird	Riparian	Summer	x	x	
Tyrannus verticalis	Western kingbird	Shrub-steppe and Steppe Grasslands	Summer	x	x	
Tyto alba	Common barn-owl	All except Urban/Industrial	Permanent	x	x	
Vermivora celata	Orange-crowned warbler	Riparian	Migrant		x	
Vermivora ruficapilla	Nashville Warbler	Riparian	Migrant		x	
Vireo gilvus	Warbling Vireo	Riparian	Migrant		x	
Vireo solitarius	Solitary Vireo	Riparian	Migrant		x	
Wilsonia pusilla	Wilson's warbler	Riparian	Migrant		x	
Xanthocephalus xanthocephalus	Yellow-headed blackbird	Riparian	Summer		x	
Zenaida macroura	Mourning dove	Shrub-Steppe, Riparian, Urban/Industrial	Summer	x	x	

Table A-1. Habitat, Season of Residence or Occurrence, and Migratory Status of Birds Occurring on JBLM YTC

Scientific Name	Common Name	Habitat	Residence	Breeds on YTC	Listed as Migratory Species by USFWS	Status/ PIF Priority[1,2,a]
Zonotrichia atricapilla	Golden-crowned sparrow	Shrub-Steppe, Riparian, Urban/Industrial	Winter, Migrant		**x**	
Zonotrichia leucophrys	White-crowned sparrow	Shrub-Steppe, Riparian, Urban/Industrial	Winter, Migrant		**x**	

[1]SC = State Candidate, SS = State Sensitive, ST = State Threatened, SE = State Endangered, FC = Federal Candidate, FCo = Federal Species of Concern

[2]PIF Continental Priorities and Objectives Defined at the State and Bird Conservation Region Levels, Washington. Rosenberg, Kenneth V. Cornell Lab of Ornithology, Ithaca NY, May 2004. Tier I. *High Continental Importance,* Tier II. *High Regional Priority,* Tier IIa. *High Regional Concern,* Tier IIb. *High Regional Responsibility*, Tier IIc. *High Regional Threats*

(a) Source: Washington Department of Fish and Wildlife, Species of Concern Listing accessed on May 10, 2010 at http://wdfw.wa.gov/wlm/diversty/soc/soc.htm

Table A-2 further details nesting habitat characteristics for the 36 migratory bird species known to nest within JBLM YTC shrub-steppe habitat. As shown in the table, the project area contains habitat characteristics which support the potential for 22 species (indicated by shaded rows) to be nesting within the construction limits of disturbance. The likely potential for take of these 22 species through nest disturbance during the nesting season and the potential level of threat to regional populations from construction disturbance is also presented in the table.

Table A-2. Summary of Potential Impacts to Migratory Bird Nests within Shrub-Steppe Habitat on JBLM YTC

Scientific Name	Common Name	Nesting Habitat[1]	Likelihood for Nesting Disturbance by Construction	Overall effect of Proposed Action on Species Populations[2, 3]
Aeronautes saxatalis	White-throated swift	Crevices in rock faces or on cliffs.	Unlikely; cliffs and rock face crevices are infrequent in construction disturbance footprints.	None.
Ammodramus savannarum	Grasshopper sparrow	Open grassy and weedy meadows, pastures and plains.	Potential for occurrence; nesting habitat is common within the disturbance footprints.	No Federal/State Status, however, PIF ranking of "Tier IIc/High Regional Threats". Estimated population within BCR 9/State of Washington is 140,000 or 0.9 percent of the global population. Due to the level of existing training activity/disturbance and regional population abundance, construction activities would have the potential for an immediate but minimal impact on this species.
Amphispiza belli	Sage sparrow	Sites with sparse shrub cover, arranged in patches, with bare ground in between.	Potential for occurrence; nesting habitat is common within the disturbance footprints.	State Candidate species and PIF ranking of "Tier IIa/High Regional Concern". Estimated population within BCR 9/State of Washington is 14,000 or 0.3 percent of the global population. Construction activities would have the potential for an immediate but minimal long-term impact on this species; the level of existing training activity/disturbance within Range 15 would reduce the potential for active nests. Due to the lower regional population levels, a short-term minor impact could occur if an active nest were disturbed during construction.
Aquila chrysaetos	Golden eagle	Require open areas with large, rocky cliffs or large trees, such as Ponderosa pines.	Unlikely; cliffs and large trees are absent in construction disturbance footprints.	None.
Asio flammeus	Short-eared owl	Open areas on the ground, on dry hummocks or ridges among tall grass or under shrubs.	Potential for occurrence; nesting habitat is common within the disturbance footprints.	No Federal/State Status, however, PIF ranking of "Tier I/High Continental Importance". Estimated population within BCR 9/State of Washington is 14,000 or 0.6 percent of the global population. Construction activities would have the potential for an immediate but minimal long-term impact on this species; the level of existing training activity/disturbance within Range 15 would reduce the potential for active nests. Due to the lower regional population levels, a short-term minor impact could occur if an active nest were disturbed during construction.
Asio otus	Long-eared owl	Abandoned stick nests, often the nests of magpies, crows, ravens, or hawks. On occasion they nest in cavities or brushy tangles.	Potential for occurrence; abundance of nesting habitat, however, is limited within the disturbance footprints.	No Federal/State Status or PIF. Due to the level of existing training activity/disturbance and limited habitat, construction activities would have the potential for an immediate but minimal impact on this species.

Table A-2. Summary of Potential Impacts to Migratory Bird Nests within Shrub-Steppe Habitat on JBLM YTC

Scientific Name	Common Name	Nesting Habitat[1]	Likelihood for Nesting Disturbance by Construction	Overall effect of Proposed Action on Species Populations[2, 3]
Athene cunicularia	Burrowing owl	Nest in burrows, often using prairie dog towns and ground squirrel burrows when they are available.	Potential for occurrence; abundance of nesting habitat, however, is limited within the disturbance footprints.	Federal and State Candidate species; no PIF. Estimated population within BCR 9/State of Washington is 3,000 or 0.1 percent of the global population. Construction activities would have the potential for an immediate but minimal long-term impact on this species; the level of existing training activity/disturbance within Range 15 would reduce the potential for active nests. Due to the lower regional population levels, a short-term minor impact could occur if an active nest were disturbed during construction.
Bubo virginianus	Great-horned owl	Most often nest in deciduous trees; sometimes nest in caves or on cliff ledges.	Unlikely; cliffs, caves, and large trees are absent in construction disturbance footprints.	None.
Buteo jamaicensis	Red-tailed hawk	Tall trees, often the tallest tree in a cluster, or on cliff ledges, towers, nest platforms, and occasionally buildings.	Unlikely; cliffs, caves, nest platforms, buildings, and large trees are absent in construction disturbance footprints.	None.
Buteo regalis	Ferruginous hawk	Typically nest on utility towers, nest platforms, or cliff ledges.	Unlikely; cliffs, utility towers, and nest platforms are absent in construction disturbance footprints.	None.
Buteo swainsoni	Swainson's hawk	Typically nest in a tree or shrub from 15-30 feet off the ground, often on top of an old magpie or crow nest, or ledges.	Unlikely; ledges and tall shrubs are absent and nest platforms are absent in construction disturbance footprints.	None
Carduelis tristis	American goldfinch	Nest is located in an upright fork of a shrub, tree, or occasionally a dense weed.	Potential for occurrence; abundance of nesting habitat, however, is limited within the disturbance footprints.	No Federal/State Status or PIF. Estimated population within BCR 9/State of Washington is 180,000 or 0.8 percent of the global population. Due to the level of existing training activity/disturbance, limited habitat, and regional population abundance, construction activities would have the potential for an immediate but minimal impact on this species.
Charadrius vociferus	Killdeer	Require a sandy or gravelly substrate for nesting near a wet or muddy area where they can forage.	Potential for occurrence; abundance of nesting habitat, however, proximity to wet/muddy areas are limited within the disturbance footprints.	No Federal/State Status, however, PIF ranking of "Tier IIa/High Concern". Due to the level of existing training activity/disturbance and limited habitat, construction activities would have the potential for an immediate but minimal impact on this species.

Table A-2. Summary of Potential Impacts to Migratory Bird Nests within Shrub-Steppe Habitat on JBLM YTC

Scientific Name	Common Name	Nesting Habitat[1]	Likelihood for Nesting Disturbance by Construction	Overall effect of Proposed Action on Species Populations[2, 3]
Chondestes grammacus	Lark sparrow	On the ground near the base of a tall weed or up in a shrub or in a rocky crevice.	Potential for occurrence; nesting habitat is common within the disturbance footprints.	No Federal/State Status or PIF. Estimated population within BCR 9/State of Washington is 30,000 or 0.3 percent of the global population. Due to the level of existing training activity/disturbance and regional population abundance, construction activities would have the potential for an immediate but minimal impact on this species.
Chordeiles minor	Common nighthawk	On open ground along rivers or other gravelly stretches.	Unlikely; gravelly stretches and riparian areas are absent within the disturbance footprints.	None.
Circus cyaneus	Northern harrier	On the ground in dense clumps of vegetation.	Potential for occurrence; nesting habitat is common within the disturbance footprints.	No Federal/State Status, however, PIF ranking of "Tier IIa/High Concern". BCR 9/State of Washington is 13,000 or 1.1 percent of the global population. Construction activities would have the potential for an immediate but minimal long-term impact on this species; the level of existing training activity/disturbance within Range 15 would reduce the potential for active nests. Due to the lower regional population levels, a short-term minor impact could occur if an active nest were disturbed during construction.
Corvus corax	Common raven	Cliffs and trees historically used as nesting sites. Now also use power poles, bridges, and other man-made structures.	Unlikely; cliffs, trees, and man-made structures are absent within the disturbance footprints.	None.
Eremophila alpestris	Horned lark	Open ground with short grass or scattered bushes.	Potential for occurrence; nesting habitat is common within the disturbance footprints.	No Federal/State Status or PIF Ranking". BCR 9/State of Washington is 1,100,000 or 0.8 percent of the global population. Due to the level of existing training activity/disturbance and regional population abundance, construction activities would have the potential for an immediate but minimal impact on this species.
Falco mexicanus	Prairie falcon	On a cliff near water; buildings and bridges.	Unlikely; cliffs and man-made structures are absent within the disturbance footprints.	None.
Falco sparverius	American kestrel	Nest primarily in cavities, usually 10-30 feet off the ground; often use cliffs in eastern part of state.	Unlikely; tall vegetation/cavities and cliffs are absent in construction disturbance footprints.	None.

Table A-2. Summary of Potential Impacts to Migratory Bird Nests within Shrub-Steppe Habitat on JBLM YTC

Scientific Name	Common Name	Nesting Habitat[1]	Likelihood for Nesting Disturbance by Construction	Overall effect of Proposed Action on Species Populations[2, 3]
Lanius ludovicianus	Loggerhead shrike	Prefer tall, dense shrubs, usually in ravines.	Potential for occurrence; abundance of nesting habitat, however, is limited within the disturbance footprints.	No Federal/State Status, however, PIF ranking of "Tier IIa/High Concern". BCR 9/State of Washington is 14,000 or 0.3 percent of the global population. Construction activities would have the potential for an immediate but minimal long-term impact on this species; the level of existing training activity/disturbance within Range 15 would reduce the potential for active nests. Due to the lower regional population levels, a short-term minor impact could occur if an active nest were disturbed during construction.
Melospiza melodia	Song sparrow	Nest sites are highly variable, usually on the ground under a clump of grass, or in a shrub within four feet of the ground.	Potential for occurrence; nesting habitat is common within the disturbance footprints.	No Federal/State Status or PIF Ranking". BCR 9/State of Washington is 200,000 or 0.4 percent of the global population. Due to the level of existing training activity/disturbance and regional population abundance, construction activities would have the potential for an immediate but minimal impact on this species.
Molothrus ater	Brown-headed cowbird	Ground and shrub/tree.	Potential for occurrence; nesting habitat is common within the disturbance footprints.	No Federal/State Status or PIF Ranking". BCR 9/State of Washington is 420,000 or 0.8 percent of the global population. Due to the level of existing training activity/disturbance and regional population abundance, construction activities would have the potential for an immediate but minimal impact on this species.
Numenius americanus	Long-billed curlew	Nest is on the ground in the open, but is often located next to an object such a rock or a shrub.	Potential for occurrence; nesting habitat is common within the disturbance footprints.	No Federal/State Status or PIF Ranking". Due to the level of existing training activity/disturbance, construction activities would have the potential for an immediate but minimal impact on this species.
Oreoscoptes montanus	Sage thrasher	Nest is usually located in or under big sagebrush or three-tip sage plants.	Potential for occurrence; abundance of nesting habitat, however, is limited within the disturbance footprints.	State Candidate species and PIF ranking of "Tier IIa/High Regional Concern". Estimated population within BCR 9/State of Washington is 60,000 or 0.7 percent of the global population. Due to the level of existing training activity/disturbance, regional population abundance, and limited habitat within the disturbance footprint, construction activities would have the potential for an immediate but minimal impact on this species.
Passerculus sandwichensis	Savannah sparrow	Nest on the ground, usually in a depression and well hidden in thick grass or under matted-down plants.	Potential for occurrence; nesting habitat is common within the disturbance footprints.	No Federal/State Status or PIF Ranking". BCR 9/State of Washington is 300,000 or 0.3 percent of the global population. Due to the level of existing training activity/disturbance and regional population abundance, construction activities would have the potential for an immediate but minimal impact on this species.

Table A-2. Summary of Potential Impacts to Migratory Bird Nests within Shrub-Steppe Habitat on JBLM YTC

Scientific Name	Common Name	Nesting Habitat[1]	Likelihood for Nesting Disturbance by Construction	Overall effect of Proposed Action on Species Populations[2, 3]
Phalaenoptilus nuttallii	Common poorwill	Bare ground.	Potential for occurrence; nesting habitat is common within the disturbance footprints.	No Federal/State Status or PIF Ranking". BCR 9/State of Washington is 14,000 or 0.5 percent of the global population. Construction activities would have the potential for an immediate but minimal long-term impact on this species; the level of existing training activity/disturbance within Range 15 would reduce the potential for active nests. Due to the lower regional population levels, a short-term minor impact could occur if an active nest were disturbed during construction.
Pica hudsonia	Black-billed magpie	Large woody shrubs or trees.	Unlikely; large woody shrubs and trees are absent in construction disturbance footprints.	None.
Pipilo maculatus	Spotted Towhee	Ground, adjacent to vegetation for concealment.	Potential for occurrence; nesting habitat is common within the disturbance footprints.	No Federal/State Status or PIF Ranking". BCR 9/State of Washington is 300,000 or 2.3 percent of the global population. Due to the level of existing training activity/disturbance and regional population abundance, construction activities would have the potential for an immediate but minimal impact on this species.
Pooecetes gramineus	Vesper sparrow	Nest on the ground in a small depression, often near the base of a grass clump, weed, or shrub.	Potential for occurrence; nesting habitat is common within the disturbance footprints.	No Federal/State Status or PIF Ranking". BCR 9/State of Washington is 200,000 or 0.8 percent of the global population. Due to the level of existing training activity/disturbance and regional population abundance, construction activities would have the potential for an immediate but minimal impact on this species.
Riparia riparia	Bank swallow	Sandy, vertical banks along rivers and lakes or where a bank has been created by human excavation.	Unlikely; riparian habitat is absent in construction disturbance footprints.	None.
Spizella breweri	Brewer's sparrow	Areas with abundant bluebunch wheatgrass and other native grasses along with scattered threetip sage.	Potential for occurrence; nesting habitat is common within the disturbance footprints.	No Federal/State Status, however, PIF ranking of "Tier I/High Continental Importance". Estimated population within BCR 9/State of Washington is 140,000 or 0.9 percent of the global population. Due to the level of existing training activity/disturbance and regional population abundance, construction activities would have the potential for an immediate but minimal impact on this species.
Sturnella neglecta	Western meadowlark	Nest on the ground under dense vegetation.	Potential for occurrence; nesting habitat is common within the disturbance footprints.	No Federal/State Status, however, PIF ranking of "Tier IIa/High Concern". Estimated population within BCR 9/State of Washington is 500,000 or 1.7 percent of the global population. Due to the level of existing training activity/disturbance and regional population abundance, construction activities would have the potential for an immediate but minimal impact on this species.

Table A-2. Summary of Potential Impacts to Migratory Bird Nests within Shrub-Steppe Habitat on JBLM YTC

Scientific Name	Common Name	Nesting Habitat[1]	Likelihood for Nesting Disturbance by Construction	Overall effect of Proposed Action on Species Populations[2, 3]
Tyrannus verticalis	Western kingbird	Nest in Ponderosa pine, utility poles, and building ledges.	Unlikely; pine habitat and man-made structures are absent in construction disturbance footprints.	None.
Tyto alba	Common barn-owl	Nests are located on cliffs, in haystacks, hollow trees, burrows in irrigation canals, or in barns, old buildings, or other cavities.	Unlikely; trees, cliffs, and man-made structures are absent in construction disturbance footprints.	None.
Zenaida macroura	Mourning dove	Typically located in a tree or shrub, but may be on the ground, on a building ledge, or other structure.	Potential for occurrence; abundance of nesting habitat, however, is limited within the disturbance footprints.	No Federal/State Status or PIF Ranking". BCR 9/State of Washington is 700,000 or 0.5 percent of the global population. Due to the level of existing training activity/disturbance, limited habitat within disturbance footprints, and regional population abundance, construction activities would have the potential for an immediate but minimal impact on this species.

[1]Nesting habitat information obtained from BirdWeb: Seattle Audubon's Guide to the Birds of Washington State http://www.birdweb.org/birdweb/.

[2] As available, population estimates were obtained from the PIF Landbird Population Estimates Database http://rmbo.org/pif_db/laped/PED3.aspx. Population estimates reflect the species abundance within that part of Bird Conservation Region (BCR) 9 that falls within the State of Washington. BCR 9 consists of the Great Basin, a large and complex region which includes the Northern Basin and Range, Columbia Plateau, and the eastern slope of the Cascade Range. This area is dry due to its position in the rainshadow of the Cascade Range and the Sierra Nevada. Grasslands, sagebrush, and other xeric shrubs dominate the flats and lowlands, with piñon-juniper woodlands and open ponderosa pine forests on higher slopes.

[3] See Table A-1 regarding Federal/State status and PIF priorities.