

CHAPTER 6

ENVIRONMENTAL CONSEQUENCES –

YAKIMA TRAINING CENTER

This chapter describes both direct and indirect impacts, as well as cumulative impacts, that would result at YTC from implementation of the action alternatives described in **Chapter 2**. This chapter is organized by resource area to describe the impacts. Impacts that would result from Alternative 1 are also identified to provide a comparative basis for the three action alternatives. The details of each of the alternatives, including the number of Soldiers and Family members stationed and/or training at the installation, the types of new construction anticipated to support the new Soldiers, the types of live-fire and maneuver training anticipated for each unit, and the number of maneuver training miles anticipated for each alternative, are provided in **Chapter 2**. These details are also summarized by alternative on the foldout table inside the front cover of Volume 2 of this document.

The overall methodology used to analyze the potential impacts (environmental consequences) on the affected environment that would result from implementation of the alternatives is described in **Appendix B**. Any additional resource-specific methodology for evaluating the potential impacts is discussed with the individual resources below.

Table 6-1 below provides a comparative summary of the potential direct and indirect impacts of implementing each alternative. **Table 6-2** provides a comparative summary of the potential cumulative effects of implementing each alternative at YTC. The tables exhibit the composite impact for each VEC resulting from implementation of each alternative.

Table 6-1 Summary of Direct and Indirect Impacts at YTC by Alternative

VEC	Alternative			
	1	2	3	4
Soil Erosion	€	W	W	W
Water Resources	W	W	W	W
Biological Resources	U	U	U	U
Wetlands	€	€	€	€
Wildfire Management	U	U	U	U
Cultural Resources	€	€	€	€
Air Quality	€	€	€	€
Noise	€	€	€	€
Land Use Conflict/Compatibility	€	€	€	€
Traffic and Transportation	€	€	€	€
Socioeconomics	€	€	€	€
Hazardous Materials and Wastes	€	€	€	€
Airspace	€	€	€	€
Facilities	€	€+	€+	€+
Energy Demand/Generation	•	€	€	€

U = Significant Effects

+ = Beneficial Effects

W = Significant but Mitigable to less than Significant Effects

N/A = Not Applicable

€ = Less than Significant Effects

• = No Effects

Proposed construction activities for each of the action alternatives are not expected to impact soil erosion significantly. Construction activities disturb soils, exposing them to wind and water erosion processes, but typically only for short periods. Constructed facilities also typically isolate underlying soil resources from erosion over long periods.

Live-fire training can have significant impacts to soils as a result of vegetation removal and cratering. Cratering directly removes soil resources from their natural position; increasing potential erosion rates and creating areas of bare ground that are more susceptible to erosion. Soils remaining in craters may be compacted and heated, reducing their ability to produce vegetation and altering their water storage and runoff characteristics. Maneuver training is capable of increasing the rate of soil erosion. In particular, off-road exercises in periods of high soil saturation and maneuvers consisting of high-speed, sharp turns can strip vegetation and disturb upper soil horizons, leading to increased rates of erosion in previously undisturbed maneuver training areas (Jones and Kunze 2003).

6.1.1 Resource-specific Significance Criteria

Factors considered when determining whether an alternative would have a significant impact on soil erosion were evaluated and distinguished by the degree to which the impact would:

- Impair the ability of the Army to sustain land resources to maintain effective training grounds and ranges;
- Result in loss of soil (through increased erosion) that exceeds the amount of soil loss at which the quality of a soil can be maintained as a medium for plant growth; or
- Conflict with existing federal, state, or local statutes or regulations.

6.1.2 Overview of Impacts to Soil Erosion by Alternative

Table 6-3 summarizes the impacts associated with soil erosion that would occur under each of the alternatives.

Table 6-3 Summary of Potential Impacts to Soil Erosion at YTC

Activity Group	Alt 1	Alt 2	Alt 3	Alt 4
Construction Direct and Indirect Effects	•	€	€	€
Live-fire Training Direct and Indirect Effects	€	W	W	W
Maneuver Training Direct and Indirect Effects	€	W	W	W
Cumulative Effects	€	W	W	W

U = Significant Effects

W = Significant but Mitigable to less than Significant Effects

€ = Less than Significant Effects

+ = Beneficial Effect

N/A = Not Applicable

• = No Effects

6.1.3 Alternative 1 — No Action Alternative

6.1.3.1 Construction Direct and Indirect Effects

6.1.3.1.1 No Effects

No construction projects would occur at YTC under Alternative 1. Because no additional soils would be disturbed, soil erosion at YTC because of construction activities would not be modified beyond levels described in **Section 5.1**.

6.1.3.2 *Live-fire Training Direct and Indirect Effects*

6.1.3.2.1 *Less than Significant Effects*

Live-fire training under Alternative 1 would occur with frequency and intensity similar to current levels. Firearms training can directly affect soil erosion due to projectile impacts and resultant disturbance of native soil and vegetative cover. Because of the large area over which munitions and ordinance impacts are dispersed, the likelihood of disturbing continuous tracts of land through cumulative cratering, and thus increasing the potential for rill and gully erosion, is small. Therefore, continued live-fire training is not expected to directly affect soil erosion significantly.

Range fires resulting from live-fire training indirectly affect soil erosion by decreasing vegetative cover and soil stability. Current management activities contained in the CNRMP/INRMP and IWFMP manage these effects through erosion control, upland revegetation, and wildland fire management. Continued implementation of these management activities results in reduced soil erosion through increased site stability (e.g., maintenance of suitable vegetative cover), maintenance and repair of erosive features (e.g., rills and gullies), and through wildland fire suppression and pre-suppression actions designed to prevent the start and spread of fires within pre-determined areas (e.g., maintenance of firebreaks). Continued implementation of the CNRMP/INRMP and IWFMP would ensure that direct and indirect effects of live-fire training on soil erosion would not impair the Army's goal of maintaining sustainable training areas, and therefore, would be less than significant.

6.1.3.3 *Maneuver Training Direct and Indirect Effects*

6.1.3.3.1 *Less than Significant Effects*

Under Alternative 1, maneuver training off road and on MIL-CLASS 4 and 5 roads would continue to be major contributors to current soil erosion at YTC. Maneuver training creates the majority of unimproved roads at YTC. Firebreaks and unimproved roads (essentially equivalent to MIL-CLASS 4 and 5 roads at YTC, respectively) have been shown to contribute significant sediment loads that are disproportionate to their limited aerial extent. For example, Distributed Hydrology Soil Vegetation Model – Hillslope Erosion Model (DHSVM-HEM) modeling indicates that roads and firebreaks contribute 66 percent and 48 percent of all sediment to two YTC catchment ponds, while they only make up 2 percent and 3 percent of the watershed areas, respectively (Wigmosta et al. 2007).

Because use of MIL-CLASS 4 and 5 roads affects their surface condition and potential for erosion (i.e., increased travel can increase rutting and potential for rill erosion), determining actual and anticipated use of these roads is necessary. Although predicting future erosion based on anticipated road use is not possible, anticipated vehicle mileages for Alternatives 2 through 4 are presented in **Appendix B**, as are assumptions used to calculate these mileages. Although mileage limits for off-road travel were established in previous EAs prepared for the SBCTs (Army 2001b, 2004b), actual current mileages are estimated to be substantially higher than these limits (**Chapter 2**).

Table 6-4 shows the estimated annual impacts on soils at YTC from maneuver training activities. These annual impacts are based on calculations and assumptions presented in **Appendix C**.

Under Alternative 1, the same types of maneuver training would occur with similar frequency and intensity as at present, and no additional unimproved roads are anticipated to be constructed. No significant additional effects to soil resources would occur from maneuver training activities. Rates of soil erosion are expected to be similar to those described in **Section 5.1**. Off-road maneuver training is constrained to areas adjacent to specific training objectives and the lands between these

objectives and nearby roads. Although current off-road travel exceeds established limits, concentrating off-road travel and surface disturbances to these areas has typically produced only 75 acres (30 ha) of disturbance each year that have required the implementation of reseeding and other restoration measures. Because current BMPs in place at YTC have effectively maintained training lands and minimize soil erosion, impacts to soils as a result of continued maneuver training activities would be less than significant.

Table 6-4 Annual Impacts of Training on Soils at YTC

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Approximate acres impacted annually by maneuver activities	24,670 to 37,000	36,000 to 54,000	36,670 to 55,000	38,000 to 57,000
Approximate acres impacted annually by digging	~ 50 acres	~ 75 acres	~ 75 acres	~ 75 acres
Acres impacted annually by training-caused fires	Variable: 100s to 1,000s of acres; fewest acres of all alternatives	Variable: 100s to 1,000s of acres; more acres than Alternative 1, fewer acres than Alternative 4	Variable: 100s to 1,000s of acres; similar number of acres to Alternative 2	Variable: 100s to 1,000s of acres; greatest number of acres of all alternatives

See **Appendix C** for calculations and assumptions.

6.1.4 Alternative 2 —GTA Actions

6.1.4.1 Construction Direct and Indirect Effects

6.1.4.1.1 Less than Significant Effects

No new cantonment facilities at YTC are proposed under Alternative 2. Construction of training ranges under Alternative 2 would directly affect soils through vegetation removal, surface disturbances, and compaction at construction sites. Similar effects would occur at supply and equipment staging areas. The displacement of soils and increased exposure to erosion through vegetation removal would indirectly affect other resources (e.g., surface water quality and wetlands) by increasing the amount of sediment that would be transported during runoff events.

An SFF range would be constructed in TAA 1, and an MPMG range would be constructed on top of an existing machine gun range at Range 5. The SFF range would require an area approximately 600 meters by 1,000 meters (about 150 acres) in size (Army 2004f). Construction would be limited to 40 stationary infantry targets, 8 moving infantry targets, and 4 firing positions, each of which would require limited soil disturbance during construction. Stationary infantry targets would each have a disturbance footprint of approximately 1 square meter. Moving infantry targets typically move along winch or chain-driven rail systems and require supports for the rails. Rail dimensions and disturbance footprints for moving infantry targets vary by manufacturer and type of system required. Dimensions of firing positions for the SFF range are not outlined in TC 25–8.

The MPMG range would require an area approximately 1,500 meters by 1,000 meters (about 371 acres) in size (Army 2004f). Similar types of targets would be constructed at the MPMG range. One-hundred and eighty stationary infantry targets, 20 moving infantry targets, and 20 stationary armor targets would be constructed. Stationary armor targets require disturbance footprints of approximately 1 square meter.

Although erosivity factors for soils at the proposed SFF and MPMG range facilities are generally moderate to high (USDA 2009), construction of these facilities is not expected to significantly impact rates of soil erosion as disruption of soils would be dispersed across the training ranges. Individual locations of ground disturbance would be, in most cases, small and segregated from other disturbances. Construction impacts would be short-term in nature, and reseeding/revegetation would be required for those sites disturbed where bare ground conditions are not required. New bare ground sites would include administrative areas (e.g., firing line areas), range/target access roads, firebreaks, and targetry positions. Impacts to soil erosion would be slightly higher than under Alternative 1; however, because they would not impair the effective maintenance of training areas or conflict with statutes or regulations, the effects would be less than significant.

6.1.4.2 *Live-fire Training Direct and Indirect Effects*

6.1.4.2.1 *Significant but Mitigable to less than Significant Effects*

Approximately 50 percent more live-fire training would occur at YTC under Alternative 2 than that which currently occurs. With the exceptions of the new SFF and MPMG ranges, live-fire training would continue on established ranges. The new SFF and MPMG ranges together would increase the area available for live-fire training by approximately 521 acres; however, a large portion of this new area lies within the footprint of existing ranges (i.e., the MPMG overlies the existing Range 5). Increased firearms training would directly affect potential soil erosion due to increased projectile impacts and resultant disturbance of native soil and vegetative cover.

Indirect effects to soil erosion from increased live-fire training include a higher potential for wildland fires to burn relatively undisturbed vegetation, thereby increasing susceptibility to erosion (Army 2007d). Increased soil disturbance above current levels resulting from wildland fires could be significant, and would require additional mitigation as discussed in **Section 6.1.8**. The MPMG would entail the use of tracer ammunition, which would increase the potential for wildland fire ignition. The SFF range would not include the use of tracer ammunition, and therefore, would not increase the potential for wildland fire ignition. Construction of the MPMG, since tracers would be used, may necessitate additional firebreaks to expand current primary and secondary containment areas around the existing Range 5 footprint. The construction and long-term maintenance of any new firebreaks would increase erosion potential from these sites, necessitating the use of BMPs to reduce this potential.

6.1.4.3 *Maneuver Training Direct and Indirect Effects*

6.1.4.3.1 *Significant but Mitigable to less than Significant Effects*

Under Alternative 2, maneuver training would occur at existing maneuver areas. Training of a third SBCT would result in increased frequency and intensity of company, battalion, and brigade maneuver training at YTC. Increased mounted and unmounted training using Stryker vehicles, including off-road travel, would be expected to damage or remove vegetation and disturb soils. Increased levels of training would likely affect a larger area and more frequently than under existing conditions.

An increase in vehicle mileage and vehicle position digging above current levels would be expected under Alternative 2. The abundance of bare ground has been shown to increase in off-road areas travelled by Strykers. Significant negative impacts to soil hydrologic stability usually occur after one Stryker pass and degradation increases with increased travel intensity (Jones and Kunze 2003). Depending on the dominant vegetation community present, the amount of bare ground present increases by 45 to 230 percent immediately after four straight-line Stryker passes. Increasing bare ground distribution at the expense of canopy, microbial, and litter covers decreases the effective

saturated conductivity of soil, which, in turn, decreases infiltration and increases runoff and soil loss (Jadczyzyn and Niedzwiecki 2005, Wigmosta et al. 2007). For each of the vegetation communities studied, approximately half of the initial increase of bare ground is recovered after 1 year (Jones and Kunze 2003). This indicates that resting training areas for longer than 1 year may be necessary to provide for effective recovery of maneuver training areas, or other solutions would be considered, such as site hardening.

Although the effects of individual maneuvers are understood, it remains difficult to quantify impacts to soil erosion and downstream sedimentation because of increased maneuver frequency. Because each Training Unit may restructure their training regimen due to anticipated theatre conditions or tactics, there are no guidelines for quantifying anticipated training effects. Previous environmental analyses of SBCT training have employed the Army Training and Testing Area Carrying Capacity (ATTACC) technique to address this issue, but this model is no longer utilized.

The Revised Universal Soil Loss Equation (RUSLE) is another technique that is available to estimate erosion rates at YTC. For current land conditions, inputs to the RUSLE are available from the Natural Resources Conservation Service (NRCS). However, assessing soil erosion resulting from increased training using the RUSLE is also hindered by the lack of an acceptable method by which RUSLE variables may be modified in anticipation of future training impacts. Furthermore, seasonal variations of soil erodibility are not incorporated in the RUSLE (Wigmosta et al. 2007). Therefore, the RUSLE has not been applied to address soil erosion impacts due to expected actions under Alternative 2. Rather, the sediment yield classes proposed by Wigmosta et al. (2007) and presented in **Table 5-3** have been modified to represent anticipated changes in land condition. This provides a quantitative estimate of increased soil loss resulting from increased maneuver training under Alternative 2.

As a worst-case scenario, a 50 percent increase in off-road maneuver training could be expected to result in a 50 percent increase in the area of YTC occupied by unimproved roads at the expense of rangeland. Because unimproved roads are areas of relatively high erosion rates, this increase is represented by a 50 percent increase in the areal extent of high sediment yield subbasins Classes 4 and 5 (high yield) subbasins (**Section 5.1.2.2**) at the expense of moderate sediment yield Class 3 areas (**Table 6-5**). It is possible that lower sediment yield subbasins Class 1 and 2 subbasins would be modified to more erosive conditions, but these impacts were not evaluated. In addition to unimproved roads, current erosion rates in Classes 4 and 5 subbasins are also a product of firebreaks or naturally erosive rangeland. Because the extent of these features is not expected to increase as a result of GTA actions, a 50 percent increase in the extent of Classes 4 and 5 subbasins is likely greater than would actually occur.

Table 6-5 Anticipated Sediment Yield at YTC Under Alternative 2

Sediment Yield Class	Mean Sediment Yield (t/ac/y)	Current Conditions			Alternative 2 Conditions		
		% of YTC Area	Sediment Yield (tpy)	% of YTC Sediment Yield	% of YTC Area	Sediment Yield (tpy)	% of YTC Sediment Yield
1	0.08	25.2	6,597	6.4	25.2	6,597	5.9
2	0.23	32.6	24,536	23.9	32.6	24,536	22.1
3	0.40	28.7	37,566	36.6	22.1	28,927	26.1
4	0.69	11.4	25,740	25.1	17.1	38,610	34.8
5	1.25	2.0	8,181	8.0	3.0	12,27g	11.1
Total Yield			102,620	tpy	Total Yield	110,941	tpy
Total acres:	327,232	Avg Yield	0.31	t/ac	Ave Yield	0.34	t/ac

Source: Current conditions data from Wigmosta et al. (2007); Alternative 2 conditions data based on discussion in **Section 6.1.4.3.1**.

This analysis considered the relative change in sediment yield based on the aforementioned changes to land condition. For current and Alternative 2 scenarios, the mean erosion rate for each sediment yield class was applied to the anticipated area of YTC covered by each of the classes. The estimated percent of overall YTC sediment yield for each class is comparable to that presented in **Table 5-3**. Under Alternative 2 actions, sediment yield Classes 4 and 5 would be expected to occupy 17.1 and 3.0 percent of YTC lands, respectively. This would result in an increased overall annual sediment yield of approximately 8,000 tons (0.02 tons/acre), or an approximate 8 percent relative increase from current conditions. The proportion of additional soil that would be deposited in YTC sedimentation ponds is unclear. Because peak runoff at YTC mostly occurs during January and February, the majority of additional sediment load that does reach the Yakima and Columbia Rivers would not be added during irrigation season, when sediment loads are highest (Joy and Patterson 1997). Therefore, sediment loss would not be expected to have significant adverse impacts on downstream water quality (**Section 6.2**).

Bivouac and digging associated with maneuver training would also be expected to increase by 50 percent under this alternative. Because of the relatively small impact to soil erosion compared to maneuver training, these activities are not incorporated into estimates of soil loss. The increased number of vehicle positions dug is expected to disturb approximately 75 acres (30 ha) of soils per year (**Table 6-4**). Soils disturbed by digging would lose productivity and cohesion due to mixing and removal of binding vegetation (Army 2007d).

Increased maneuver training required under Alternative 2 would also affect the ability to maintain natural soil productivity at sustainable levels. For each soil unit at YTC, the soil loss tolerance factor (T factor) determined by the NRCS is an estimate of the maximum average annual rate of soil erosion can occur without affecting vegetative productivity over a sustained period (USDA 2009). When compared to current erosion rates at YTC (Wigmosta et al. 2007), 1,222 acres (495 ha) are presently losing soil at rates above this threshold. Following the assumptions presented above and summarized in **Table 6-5**, potential worst-case scenario impacts to soil sustainability resulting from maneuver training under Alternative 2 are discussed below.

Up to 54,000 acres (21,853 ha) could be impacted by off-road maneuver training annually at YTC under Alternative 2. This represents the maximum disturbed area possible under anticipated off-road mileages (**Appendix C**). In reality, this number may be much lower, due to the current tendency for maneuver training to be confined to roads at areas directly between roads and training objectives. However, because there are no regulations providing that this approach is taken, and because the numbers of off-road miles presented in **Appendix B** are expected to be driven, there is the potential for the surface disturbances shown in **Table 6-4** to occur.

Most of the affected soils would be in Assembly Areas and areas close to existing roads and trails. Using ArcExplorer, potential maneuver areas were selected by removing cantonment and urban areas, impact areas, proposed and existing live-fire training ranges, and other areas at YTC where maneuver training would likely not be conducted due to other military activities. Areas of sensitive environmental concern or slope gradients greater than 30 percent were also excluded from what are considered primary potential maneuver areas.

Approximately 80,000 acres (32,375 ha) are available for Stryker training at YTC (Nissen and Kelley 2009). The exact locations of these areas were not available during this analysis, but it is recognized that most off-road training would be in areas near roads and training objectives. Assuming that off-road travel would be constrained to areas adjacent to existing roads, a 464-foot (141-m) buffer was created around unimproved roads and trails (232 feet (71 m) from the centerline on each side of the road) identified within the maneuver area described in the preceding paragraph. This provides an 'affected soils' area of 54,000 acres (21,853 ha). Because all of the lands expected

to be impacted by maneuver training are within the ‘affected soils’ area, the areas expected to transform from sediment yield Class 3 to Classes 4 and 5 (**Table 6-5**) would also be contained within the same area. Although a larger proportion of Class 3 soils is expected to transition to Class 4 than Class 5, the mean annual sediment yield of Class 4 (0.69 tons/year) is less than 1 ton per acre. Because no soils at YTC are assigned soil loss tolerability factors of less than 1, all Class 4 lands (existing and created as a result of maneuver training) are expected to maintain natural soil productivity at sustainable levels.

In areas that transition from Class 3 to Class 5, annual sediment yield levels (mean of 1.25 tons/acre) are expected to exceed tolerable soil loss levels in areas where the T factor equals 1 ton per acre per year. Because there is no method available to predict which portions of the maneuver area would actually be impacted, Class 3 soil polygons were selected at random from the ‘affected soils’ area until the selected acreage was 3,280 acres ([1,330 ha] approximately 1 percent of YTC lands – see **Table 6-5**). The sediment yield of the selected soils was then reassigned to the mean yield of Class 5 soils (1.25 tons/acre). Finally, the sediment yield of the randomly selected soils was compared to their T factor. This approach estimates that each year, sediment loss rates for approximately 1,770 acres (720 ha) of soils could increase beyond tolerable levels – twice the current area. Although this is a small fraction of YTC lands, because this area represents potential annual disturbance and because vegetative cover of soils only partially recovers within 1 year of initial disturbance (Jones and Kunze 2003), there is potential for significant impact to soil quality at YTC.

Estimates of soils that could be impacted beyond tolerable levels are based on maximum possible disturbance areas. Current and probable future maneuver training at YTC is, and would likely be, concentrated around objectives such as battle courses. This would constrain a majority of off-road travel to areas much smaller than the overall area available at YTC. Therefore, damage to soils in these areas would be more intense, but also spatially constrained. Estimates of 54,000 acres (21,853 ha) of soils that could be impacted by maneuver training and 1,770 acres (720 ha) of soils that could be rendered unsustainable are potentially higher than realistic levels, but provide a maximum possible level of disturbance that could need to be addressed. Alternatively, if the current annual area of approximately 75 acres (30 ha) that requires restoration increases by 50 percent, commensurate with increased training levels, approximately 110 acres (45 ha) of soils would need restoration on an annual basis (**Section 6.1.8**). Because training objectives can change at the discretion of training commanders and due to combat theater requirements, it is impossible to predict exactly where and to what extent soils would be impacted under this alternative. However, in the circumstance where increased levels of restoration are deemed necessary and completed successfully, impacts to soil erosion would not affect the Army’s capability to maintain sustainable training areas, nor would there be conflict with existing statutes or regulations. Hence, potentially significant impacts would be mitigated to less than significant levels. If soil erosion does increase substantially beyond current levels, and the necessary restoration and rehabilitation are not performed, the significant loss of productive soils and effective training areas could occur. As identified in the 2007 YTC Land Management Report, additional resources will be necessary to increase erosion monitoring and data collection processes and equipment, especially in response to increased training levels (Durkee 2007).

6.1.5 Alternative 3 — GTA Actions + CSS Soldiers

6.1.5.1 Construction Direct and Indirect Effects

6.1.5.1.1 Less than Significant Effects

Alternative 3 would not require the construction of any range projects additional to those required for Alternative 2. Therefore, impacts to soil erosion from construction would be the same as under Alternative 2.

6.1.5.2 *Live-fire Training Direct and Indirect Effects*

6.1.5.2.1 *Significant but Mitigable to less than Significant Effects*

Training requirements for each of the units that compose a CSS unit include live-fire training, although the type, frequency, and intensity of individual and crew-served weapons practice and qualifications would vary with the distribution of CSS units. Some convoy and urban operations training would be expected, but significant increase of heavy ordnances is not expected compared to Alternative 2. Direct and indirect impacts to soil erosion from live-fire training munitions impacts and potential wildfires are expected to increase regardless of unit structure.

Because live-fire training would occur at the same existing or newly constructed training ranges as under Alternative 2, and would primarily consist of personal weapons training, direct and indirect (e.g., wildfires) impacts to soil erosion from live-fire training under Alternative 3 are not expected to increase significantly from those anticipated under Alternative 2. Similar adaptive soil and wildland fire management techniques and programs would be necessary under Alternatives 2 and 3 (see **Sections 6.1.8** and **6.5.8**). When sufficiently executed, these programs are expected to maintain effective training lands and minimize soil erosion to less than significant levels.

6.1.5.3 *Maneuver Training Direct and Indirect Effects*

6.1.5.3.1 *Significant but Mitigable to less than Significant Effects*

Similar limitations to quantifying effects of and identifying mitigation techniques applicable to maneuver training at YTC under Alternative 2 apply to Alternative 3. CSS maneuver training would occur on roads, trails, and maneuver areas at YTC and would involve use of HMMWVs, HET trucks, cargo trucks, fuels trucks, and other vehicles. Although training could potentially occur on unimproved or limited off-road areas, most maneuver training would be limited to existing roads. Training frequency, intensity, and type would vary depending on the final distribution of CSS units, but are not expected to increase soil disturbance significantly above that anticipated under Alternative 2 because support vehicles typically cause less disturbance to soils and vegetation than do Strykers.

Current soil management policies and practices, such as avoiding off-road travel during periods of high soil saturation, would limit effects of CSS maneuver training on soil erosion. Impacts to soil erosion and management policies and practices necessary to maintain sustainable training ranges are not expected to vary significantly from those under Alternative 2. The additional training of CSS Soldiers is not expected to increase off-road travel mileage significantly above that which was described for Alternative 2. Because there is no anticipated difference between soil erosion levels under Alternatives 2 and 3, the same mitigation strategy for Alternative 2, when fully implemented, would maintain effective training lands and rates of soil erosion effects at less than significant levels.

6.1.6 Alternative 4 — GTA Actions + CSS Soldiers + Medium CAB

6.1.6.1 *Construction Direct and Indirect Effects*

6.1.6.1.1 *Less than Significant Effects*

No additional facilities would be constructed at YTC under Alternative 4 beyond those that would be constructed under Alternative 2. Therefore, impacts to soil erosion would be the same as under Alternative 2.

6.1.6.2 Live-fire Training Direct and Indirect Effects

6.1.6.2.1 Significant but Mitigable to less than Significant Effects

Medium CAB live-fire training would occur at the same existing or newly constructed training ranges as under Alternatives 2 and 3, and would primarily consist of personal weapons training. Direct and indirect (e.g., wildfires) impacts to soil erosion from live-fire training under Alternative 4 are not expected to increase significantly from those anticipated under Alternative 3. Similar adaptive soil and wildland fire management techniques and programs would be necessary as under Alternatives 2 and 3 (**Sections 6.1.8** and **6.5.8**) to ensure that effective training areas are maintained and soil erosion is minimized. When sufficiently executed, these programs are expected to maintain impacts to soil resources at less than significant levels.

6.1.6.3 Maneuver Training Direct and Indirect Effects

6.1.6.3.1 Significant but Mitigable to less than Significant Effects

Similar limitations to quantifying effects of and identifying mitigation techniques applicable to maneuver training at YTC discussed under Alternative 2 apply to Alternative 4. Medium CAB maneuver training at YTC would include flight and joint unit training at facilities, such as the DMPRC. Because many of the soils at YTC are susceptible to wind erosion, flight training, such as landing/takeoff operations in maneuver areas or other training ranges, would be expected to impact soil erosion. In addition, dust clouds in these areas could lead to pilot vision impairment and increased helicopter maintenance needs. Areas where recurring take offs, landing, and hovering activities occur have previously been hardened to support this type and level of use. Additional sites will be evaluated for similar treatment in the future should the need be identified. The training of the medium CAB is expected to increase off-road travel from what was described under Alternative 3 by approximately 20,000 miles (32,000 km; **Appendix B**). However, most of the additional off-road travel would be conducted by MHWV and MWT vehicles, which create lower impacts to soils than Strykers. Impacts to soil erosion and management policies and practices necessary to maintain sustainable training ranges would not be expected to vary significantly from those under Alternatives 2 and 3.

6.1.7 Cumulative Effects

6.1.7.1 Significant but Mitigable to less than Significant Effects

Current and anticipated projects and actions conducted by the Army and non-Army operators on and near YTC, in conjunction with the alternatives, are expected to produce less than significant cumulative impacts to soil erosion on YTC and in the surrounding areas. Live-fire and maneuver training by visiting units on YTC would have additive impacts on soil erosion. Ongoing training, including HIMARS launching and other small arms tracer fire, at YTC could affect soil erosion by increasing the likelihood of igniting wildfires. Other military actions are expected to contain mitigation measures to protect against significant increases in soil erosion. Although direct and indirect impacts to soils at YTC would occur under the alternatives, with the greatest impacts occurring under Alternative 4, cumulative effects on soil erosion at YTC are not expected to increase significantly beyond current levels when properly maintained through an adaptive management program (**Section 6.1.8**). Although YTC's semi-arid climate, steep slopes, and sparse vegetation contribute to highly erosion-prone soils, adaptation of current soil management practices and policies in light of increased training levels would continue to maintain soil erosion at levels that would not exceed any of the resource-specific significance criteria.

6.1.8 Mitigation

Currently, YTC implements a variety of BMPs to mitigate the effects of the Army's activities on soil erosion. These BMPs include repairing areas damaged by maneuvers; deterring vehicles from creating new trails; implementing various plans, such as EPPs; minimizing training during periods of high soil moisture and in areas prone to soil erosion such as steep slopes; and rotating training among the TAs (**Table 6-33**). In addition to the BMPs, YTC proposes to implement increased ITAM program maintenance of training lands to minimize effects to soils and to modify the YTC CNRMP/INRMP to account for wind erosion (**Table 6-34**).

6.2 WATER RESOURCES

Potential impacts to water resources were identified based on regulatory standards, scientific judgment, and public concerns expressed during the scoping process. Regulatory standards considered during the impact analysis included, but were not limited to, the following:

- Federal and state primary and secondary drinking water standards under the Safe Drinking Water Act;
- State and local plans and policies protecting surface water and groundwater resources;
- Limits on development of available surface and groundwater resources;
- Compliance with the Clean Water Act (CWA); and
- State water code regulations.

Public concerns related to water resources at YTC identified during the scoping process include:

- The effects of Army Growth and Force Structure Realignment on surface water resources at YTC; and
- The effects of construction and demolition activities and long-term operations on surface and groundwater quality, including drinking water sources, and hydrology.

Analysis of impacts was based on multiple factors related to activity groups associated with the proposed actions. Impacts from range construction and impacts from live-fire and maneuver training were evaluated for their potential to affect water resources adversely.

Impacts on water resources were analyzed by evaluating two groups of impact issues. These include impacts on surface and groundwater quality and quantity.

Both direct and indirect impacts were evaluated for each alternative. Direct impacts to water resources include increased water use due to increased troop numbers. Impacts to water resources may also result from impacts to other affected resources, such as soils and vegetation, which also have the potential to alter flow dynamics and water quality.

6.2.1 Resource-specific Significance Criteria

Factors considered when determining whether an alternative would have a significant impact on water resources include the extent or degree to which its implementation would:

- Degrade surface or groundwater quality in a manner that would reduce the existing or potential beneficial uses of the water;

- Reduce the availability of, or accessibility to, one or more of the beneficial uses of a water resource;
- Alter the existing pattern of surface or groundwater flow or drainage in a manner that would adversely affect the uses of the water within or outside the project region;
- Be out of compliance with existing or proposed water quality standards or with other regulatory requirements related to protecting or managing water resources; or
- Be out of compliance with the CWA.

6.2.2 Overview of Impacts to Water Resources by Alternative

Table 6-6 summarizes the potential impacts to water resources, including surface water and groundwater quantity and quality that would occur under each of the alternatives.

Table 6-6 Summary of Potential Impacts to Water Resources at YTC

Activity Group	Alt 1	Alt 2	Alt 3	Alt 4
Construction Direct and Indirect Effects	•	€	€	€
Live-fire Training Direct and Indirect Effects	€	€	€	€
Maneuver Training Direct and Indirect Effects	W	W	W	W
Cumulative Effects	W	W	W	W

U = Significant Effects

W = Significant but Mitigable to less than Significant Effects

€ = Less than Significant Effects

+ = Beneficial Effect

N/A = Not Applicable

• = No Effects

6.2.3 Alternative 1 — No Action Alternative

6.2.3.1 Construction Direct and Indirect Effects

6.2.3.1.1 No Effects

6.2.3.1.1.1 Surface Water Quantity and Quality

No construction activities are proposed at YTC under Alternative 1; therefore, no impacts to surface water resources related to construction activities would occur.

6.2.3.1.1.2 Groundwater Quantity and Quality

No construction activities are proposed at YTC under Alternative 1; therefore, no impacts to groundwater resources related to construction activities would occur.

The available water supply is adequate to meet existing demand, and groundwater withdrawals are not considered to be adversely affecting other area groundwater resources. Force structure and assigned personnel under Alternative 1 would remain the same as under the existing conditions; therefore, there would be no increase in water use and consequently no impacts to groundwater quantity beyond those occurring under existing conditions.

6.2.3.2 Live-fire Training Direct and Indirect Effects

6.2.3.2.1 Less than Significant Effects

6.2.3.2.1.1 Surface Water Quantity and Quality

Under Alternative 1, continued live-fire training could potentially result in impacts to surface water quality from the introduction of munitions chemical residues that could degrade the water quality

and beneficial uses. However, no impacts due to chemical residues from live-fire training have been observed to date.

Live-fire training could also increase erosion and sedimentation due to soil disturbance from projectile impacts and from wildland fires caused by training, which make soils more susceptible to erosion. Cratering related to projectile impacts directly removes soil resources from their natural position, increasing potential erosion rates, and creates areas of bare ground that are more susceptible to erosion. Soils remaining in craters may be compacted and heated, reducing their ability to produce vegetation and altering their water storage and runoff characteristics. However, these impacts are not anticipated to affect existing drainage patterns and degrade water quality to a degree where they would affect beneficial uses. Therefore, the impacts are considered less than significant.

Compared to current levels, live-fire training under Alternative 1 would remain unchanged, and the munitions constituents would be identical to those currently in use. Therefore, no additional impacts would result from implementation of Alternative 1. Impacts to surface water quality could also result from contamination of surface water from spills during training activities. However, YTC requires all spills to be cleaned up; therefore, any potential effects are anticipated to be less than significant.

6.2.3.2.1.2 Groundwater Quantity and Quality

Impacts to shallow groundwater resources from live-fire training could potentially occur from introduction of chemical constituents through leaching and percolation. No such impacts have been observed to date in the area. Compared to current levels, live-fire training would remain the same and the munitions constituents would be identical to those currently in use. Therefore, no impacts would result from implementation of Alternative 1. Impacts to groundwater quality could also result from accidental release of contaminants (e.g., fuel spills) during training activities. However, continued implementation of BMPs, such as spill prevention and clean up, would minimize potential impacts resulting from leaks or spills of hazardous materials.

6.2.3.3 *Maneuver Training Direct and Indirect Effects*

6.2.3.3.1 *Significant but Mitigable to less than Significant Effects*

6.2.3.3.1.1 Surface Water Quantity and Quality

Under Alternative 1, continued existing levels of maneuver training could result in impacts to surface water quality from nonpoint source sediment loading and accidental spills, increased runoff, and degradation of the stream channel. As described in **Section 5.2**, soil disturbance related to maneuver training, as well as other land use activities, have historically contributed to degradation of many streams at YTC. For example, channel incisions have caused discontinuity between the channel and floodplain. As incision continues, flow becomes more concentrated, and increased degradation results from decreased upland and bank storage capacity. This process can effectively lower the water table and affect the presence and composition of riparian vegetation. An increase in the amount of bare ground can reduce the quantity of water held within upland areas and increase overland flow. This can increase discharge of peak flows and decrease the duration of flood flows. Wildland fires resulting from training can also decrease both upland and riparian vegetative cover, and can reduce soil stability, thereby increasing erosion and sedimentation to streams. Current programs for upland and riparian restoration and watershed protection have had a positive effect on the condition of riparian areas on YTC and would continue under Alternative 1.

The primary impacts under Alternative 1 would be related to sedimentation and erosion from off-road vehicle maneuvering, specifically those involving stream crossings. However, SBCTs account for most of the maneuver training conducted at YTC and only about 20 percent would involve cross-

country or off-road travel. Compared to training at Fort Lewis, about 70 percent of the off-road maneuver miles would occur at YTC.

The severity and extent of vehicle impacts depend on the physical characteristics of the vehicle and its movement as well as frequency of training. For example, tracked vehicles are inherently more damaging to the land and ecology of an area, thus lending to greater soil instability and loss of vegetation and creating more runoff from water erosion. An experimental study was implemented in the summer of 2001 to assess effects of the Light Armored Vehicle (LAV), very similar to the Stryker vehicle, on vegetation and ground surface characteristics of three ecological communities at YTC. Based on this study, the initial environmental effects and short-term response from LAV vehicles were less severe than those from tracked vehicles on shrub-steppe communities at YTC. After 1 year, thresholds for significant LAV damage were higher relative to damage thresholds for tracked vehicles, but results varied by community and attribute examined (Jones and Kunze 2003). SBCTs do not employ any tracked vehicles, resulting in less soil disturbance and lower impacts from sedimentation.

The management activities described in **Sections 5.1, 5.2, and 5.3** benefit water resources by reducing and minimizing discharge of sediment to both the Yakima and Columbia Rivers. The program includes management and rotation of training areas to allow vegetation to recover, active restoration by planting, construction of sediment-trapping check dams at critical locations, and protection of critical riparian vegetation corridors by restrictions on use. As a result, the magnitude of suspended solids contribution from YTC is very small compared to other sources (such as agriculture and grazing). Frequency of maneuver training would also remain the same as under the existing conditions; therefore, no additional impacts beyond those currently occurring would result from implementation of Alternative 1.

Training activities may also result in accidental releases of fuels, solvents, and other hazardous and toxic substances into the environment. Potential spills would typically be small in magnitude and localized and would be addressed effectively through standard procedures.

6.2.3.3.1.2 Groundwater Quantity and Quality

Potential impacts to groundwater could result from compaction of soils and subsequent decreased percolation to groundwater following maneuver training and impacts to water quality related to spills. However, due to limits on off-road maneuvering and tracked vehicle use, as well as continuation of the vegetation restoration and watershed protection program, the impacts are expected to be minimal. The Army would continue to implement spill prevention, containment, and clean-up BMPs and mitigation measures to address any potential impacts. No impacts to groundwater beyond those currently occurring would result from implementation of Alternative 1.

6.2.4 Alternative 2 —GTA Actions

6.2.4.1 *Construction Direct and Indirect Effects*

6.2.4.1.1 *Less than Significant Effects*

6.2.4.1.1.1 Surface Water Quantity and Quality

Construction of the training ranges under this alternative could result in increases in erosion and runoff. Use of heavy construction equipment would cause compaction of near-surface soils, which could result in increased runoff and increased sedimentation. Clearing and grading during construction would expose the soils to erosion. Intermittent streams that drain to Selah Creek pass through the footprint of the proposed range facilities. Suspended solids could be carried from the

footprint of the proposed range projects to Selah Creek and eventually discharged to Yakima River. These impacts would be short-term and limited to the active construction phase. Engineering controls and BMPs would be used to minimize erosion and soil loss during construction. As described in **Section 5.2**, to date, conclusions indicate that sediment loads from YTC contribute only a small fraction of total sediment loads in the Columbia and Yakima systems. Pursuant to provisions in the CWA, contractors must submit a NOI to obtain coverage under the National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges from Construction Activities for each construction project that disturbs 1 acre or more of land. Contractors must also develop and implement a SWPPP for each project that outlines mitigation strategies to reduce impacts associated with storm water runoff during construction. The Army would incorporate BMPs that would reduce runoff and sedimentation to aquatic environments in accordance with CWA regulations for storm water runoff at construction sites.

Increased imperviousness of surfaces caused by construction of facilities at the new ranges would slightly increase storm water runoff from these areas over the long-term. However, new facilities would be constructed with storm water BMPs as appropriate and necessary. With mitigation measures in place, these impacts are expected to be less than significant.

Construction activities would also temporarily increase the use of fuels, solvents, and other hazardous and toxic substances, which could result in indirect impacts to surface water if accidentally released into the environment. Potential spills would be typically small in magnitude and localized. Impacts from spills would be addressed effectively through existing BMPs and standard procedures, which include training personnel in spill prevention and control techniques and requirements, maintaining appropriate spill control equipment in areas where refueling may occur, prohibiting refueling and storage of fuel near water bodies, and complying with all hazardous materials management regulations. Preventive measures would also include safe driving practices and following proper procedures for transporting hazardous materials in compliance with Army, state, and federal regulations. All facilities that generate hazardous wastes or that store hazardous materials would employ appropriately trained personnel to manage these materials. Hazardous materials are managed according to the Army's standard operating procedures and in compliance with state and federal requirements. Facilities would be designed with engineering controls, such as secondary containment, automatic shutoff controls, and other systems, to reduce the potential for releases. If releases were to occur, they would be cleaned up. With these established measures, impacts are expected to be less than significant.

6.2.4.1.1.2 Groundwater Quantity and Quality

Range construction could result in short-term, localized effects that would include increased overland flow and runoff and consequently decrease percolation to shallow groundwater aquifers. These impacts are expected to be less than significant since they would not affect the availability and beneficial uses of groundwater. Potential impacts may also result from spills and leaks, which could adversely affect shallow groundwater resources. Engineering controls and BMPs, including the SWPPP, would be used to minimize these potential impacts to a less than significant level.

No additional Soldiers would be permanently stationed at YTC under this alternative. However, the amount of training personnel and related water demand would increase due to addition of 1,878 Soldiers stationed at Fort Lewis that would train at YTC for some portion of the year. Assuming a consumption rate of 9.21 g/p/d (35 L/p/d), this would translate to a daily increase of 17,300 gallons (65,500 L). The existing water supply system at YTC would be capable of supporting the anticipated additional potable water demand created by this alternative.

6.2.4.2 Live-fire Training Direct and Indirect Effects

6.2.4.2.1 Less than Significant Effects

6.2.4.2.1.1 Surface Water Quantity and Quality

Potential impacts related to live-fire training would be the same in nature as those described under Alternative 1 and would include increased erosion, introduction of munitions chemical residues, and contamination of surface water from spills. Although the live-fire training would increase by approximately 50 percent under this alternative, the munitions constituents would remain identical to those currently in use. Because no impacts to surface water from munitions residues have been observed at YTC in the past, none would be anticipated under Alternative 2.

Increased live-fire training would directly affect potential soil erosion and sedimentation due to increased projectile impacts and resultant disturbance of native soil and vegetative cover. Increased live-fire training would also increase potential for wildland fires, which typically make soils more susceptible to erosion and would reduce upland and riparian vegetative cover. Decreased vegetative cover can reduce the quantity of water held within upland areas and increase overland flow. However, most live-fire training would occur on fixed ranges, which represent a small portion of the overall land area; therefore, the overall increase in soil disturbance from live-fire training would be negligible, and erosion and sedimentation impacts would be less than significant.

6.2.4.2.1.2 Groundwater Quantity and Quality

Potential impacts to groundwater resources from live-fire training would be the same as those described under Alternative 1. Even though live-fire training would increase by 50 percent under this alternative, the munitions constituents would be identical to those currently in use, and no impacts to groundwater quality would be anticipated.

6.2.4.3 Maneuver Training Direct and Indirect Effects

6.2.4.3.1 Significant but Mitigable to less than Significant Effects

6.2.4.3.1.1 Surface Water Quantity and Quality

Potential impacts related to maneuver training would be the same in nature as those described under Alternative 1 and would include impacts to surface water quality from nonpoint source sediment loading and accidental spills, increased runoff, and wildland fire degradation. However, increased training under Alternative 2 would increase the disturbance of vegetation and soil, thereby causing increased erosion of soil and subsequent potential discharge of suspended solids into streams. The training would also include more vehicle crossings of intermittent streams, more digging, and additional area assembly activities, all of which would add to erosion and sedimentation.

The primary impacts would result from off-road vehicle maneuver training. Erosion impacts from off-road maneuvering are difficult to quantify; however, simplified analysis is presented in **Section 6.1.4.3.1**. Based on this analysis, the overall annual soil loss on YTC would increase by approximately 8 percent compared to current conditions. Soil loss, however, represents material actually removed from a site and is generally greater than the actual sediment transported to a stream. The sediment transport mechanism depends on the capacity of a watershed to deliver suspended material. For example, hydraulically rough landscapes transport sediment inefficiently; thus, much of the eroded sediment is deposited in the landscape and never reaches the stream.

Sedimentation impacts from Alternative 2 would have a potential to increase by less than 8 percent compared to those under Alternative 1. This increase does not represent a significant increase that

would result in significant degradation of water quality and beneficial water uses beyond those identified under Alternative 1. Impacts from training activities would continue to be addressed effectively through land use policies that prohibit ground-disturbing activities in sensitive areas, limit activities near water bodies and riparian corridors, promote vegetated buffer zones near waterways, continue upland and riparian revegetation and restoration actions described in the CNRMP/INRMP, implement the IWFMP, and use inert environmentally friendly training rounds (e.g., non-exploding or dud producing rounds) when possible. Additionally, the existing rangeland restoration/rehabilitation and watershed protection programs contained in the CNRMP/INRMP would be continued to maintain water quality. This program reduces suspended solids discharges by minimizing streambed and gully erosion and reducing disturbance of soils at stream crossings. Implementation of these BMPs and programs would mitigate training impacts under Alternative 2 to a less than significant level.

6.2.4.3.1.2 Groundwater Quantity and Quality

Potential impacts to groundwater would be the same in nature as those described under Alternative 1. Increased maneuver training with the Stryker is expected to lead to more soil compaction and overland surface flow, which in turn may reduce percolation and groundwater recharge. The potential for impacts from accidental spills would also increase due to increased training under this alternative. With the implementation of the BMPs and other measures for range restoration/rehabilitation and spill prevention and cleanup outlined above, impacts to groundwater are expected to be minimal.

6.2.5 Alternative 3 — GTA Actions + CSS Soldiers

6.2.5.1 *Construction Direct and Indirect Effects*

6.2.5.1.1 *Less than Significant Effects*

6.2.5.1.1.1 Surface Water Quantity and Quality

No additional construction activities are proposed at YTC under the Alternative 3; therefore, no additional impacts to surface water resources related to construction activities would occur beyond those identified under Alternative 2.

6.2.5.1.1.2 Groundwater Quantity and Quality

No additional construction activities are proposed at YTC under the Alternative 3; therefore, no additional impacts to groundwater resources related to construction activities would occur beyond those identified under Alternative 2.

No additional Soldiers would be permanently stationed at YTC under this alternative. However, the amount of training personnel and related water demand would increase due to addition of 2,878 GTA and CSS Soldiers stationed at Fort Lewis that would train at YTC during some portion of the year. Assuming a consumption rate of 9.21 g/p/d (35 L/p/d), this would translate to a daily increase of 26,500 gallons (100,300 L). The existing water supply system at YTC would be capable of supporting the anticipated additional potable water demand created by this alternative.

6.2.5.2 *Live-fire Training Direct and Indirect Effects*

6.2.5.2.1 *Less than Significant Effects*

6.2.5.2.1.1 Surface Water Quantity and Quality

Only a minimal increase in live-fire training would result from this alternative. Potential impacts related to live-fire training would be the same in nature as those described under Alternative 1.

Although the live-fire training would increase under this alternative, the munitions constituents would remain identical to those currently in use, and no measurable impacts from munitions residues are anticipated. Potential impacts from sedimentation and erosion would increase by some small amount; however, because most live-fire training would occur on fixed ranges, which represent a small portion of the overall land area, the overall increase in soil disturbance from live-fire training would be negligible, and these impacts are expected to be less than significant.

6.2.5.2.1.2 Groundwater Quantity and Quality

Potential impacts to groundwater resources from live-fire training would be the same as those described under Alternatives 1 and 2. Even though live-fire training would increase compared to Alternative 2, the munitions constituents would be identical to those currently in use, and no additional impacts to groundwater quality would be anticipated.

6.2.5.3 *Maneuver Training Direct and Indirect Effects*

6.2.5.3.1 *Significant but Mitigable to less than Significant Effects*

6.2.5.3.1.1 Surface Water Quantity and Quality

Potential impacts related to maneuver training would be the same in nature as those described under Alternative 1. Alternative 3 would result in an additional increase in the amount of maneuver training conducted at YTC compared to Alternative 2. However, due to limits on off-road maneuvering, the increased maneuver training with CSS units would lead to a minimal increase in maneuver impacts compared to Alternative 2.

6.2.5.3.1.2 Groundwater Quantity and Quality

Potential impacts to groundwater would be the same in nature as those described under Alternative 1. The potential for these impacts would increase slightly due to increased maneuver training under this alternative. With implementation of BMPs and other measures, impacts to groundwater are expected to be less than significant.

6.2.6 **Alternative 4 — GTA Actions + CSS Soldiers + Medium CAB**

6.2.6.1 *Construction Direct and Indirect Effects*

6.2.6.1.1 *Less than Significant Effects*

6.2.6.1.1.1 Surface Water Quantity and Quality

No additional construction activities are proposed at YTC under Alternative 4; therefore, no additional impacts to surface water resources related to construction activities would occur, beyond those identified under the previous alternatives.

6.2.6.1.1.2 Groundwater Quantity and Quality

No additional construction activities are proposed at YTC under Alternative 4; therefore, no additional impacts to groundwater resources related to construction activities would occur, beyond those identified under the previous alternatives.

No additional Soldiers would be permanently stationed at YTC under this alternative. However, the amount of training personnel and related water demand would increase due to the addition of 5,678 Soldiers stationed at Fort Lewis that would train at YTC during some portion of the year. This total amount includes the SBCT, GTA Soldiers, CSS, and CAB units, which would most likely not be

training at YTC at the same time and would only train for short periods. Assuming a consumption rate of 9.21 g/p/d (35 L/p/d), this would translate to a daily increase of 52,300 gallons (198,000 L). The existing water supply system at YTC would be capable of supporting the anticipated additional potable water demand created by this alternative.

6.2.6.2 *Live-fire Training Direct and Indirect Effects*

6.2.6.2.1 *Less than Significant Effects*

6.2.6.2.1.1 Surface Water Quantity and Quality

In addition to impacts discussed under the previous alternatives, this alternative would result in additional impacts related to aerial gunnery training. Use of weaponry such as grenades, .50 cal., and rockets would result in increased soils disturbance, and therefore, increased erosion and potential for sedimentation. Even though this alternative would involve increased amounts of ammunition expended, the constituents are expected to be similar to those currently in use. Since no impacts from munitions residues have been observed in the area to date, these impacts are expected to be less than significant. Potential impacts related to sedimentation from wildland fires, and spills from established refueling points would increase under this alternative; however, implementation of BMPs would minimize any potential impacts to surface water to less than significant level.

6.2.6.2.1.2 Groundwater Quantity and Quality

Potential impacts to groundwater resources from live-fire training would be similar to those under the other alternatives. Even though live-fire training would increase under this alternative, the munitions constituents would be similar to those currently in use, and potential impacts to groundwater quality would involve increased amounts of ammunition expended by the medium CAB Soldiers. Since no impacts from munitions residues have been observed in groundwater to date, these impacts are expected to be less than significant. Potential impacts from spills would also increase under this alternative. However, continued implementation of BMPs would minimize potential impacts resulting from leaks or spills of hazardous materials.

6.2.6.3 *Maneuver Training Direct and Indirect Effects*

6.2.6.3.1 *Significant but Mitigable to less than Significant Effects*

6.2.6.3.1.1 Surface Water Quantity and Quality

Flight and joint military training associated with medium CAB maneuver training would occur on ranges such as the DMPRC. The training of the medium CAB is not expected to result in extensive digging exercises or significantly increase off-road travel mileage. Due to limited off-road maneuvering associated with the CAB, these impacts are not expected to increase measurably beyond those discussed under previous alternatives. BMPs would continue to be implemented to protect water quality at YTC.

6.2.6.3.1.2 Groundwater Quantity and Quality

Potential impacts to groundwater would be the same in nature as those described under the previous alternatives and could result from compaction of soils and subsequent decreased percolation to groundwater aquifers during maneuver training. Due to limited ground-based activities associated with medium CAB training, these impacts are not expected to increase measurably beyond those discussed under previous alternatives. The potential for impacts from accidental spills would, however, increase slightly due to training associated with the medium CAB. With implementation of BMPs and other measures, impacts to groundwater are expected to be minimal.

6.2.7 Cumulative Effects

6.2.7.1 *Significant but Mitigable to less than Significant Effects*

6.2.7.1.1 *Surface Water Quantity and Quality*

Cumulative effects to water resources may occur from past, present, and reasonably foreseeable future projects and activities. Potential cumulative effects to surface water quality and quantity resulting from these activities include increased erosion and sedimentation, increased surface runoff, and degradation of the stream channel. Cumulative effects to surface water could also occur from surface disturbance related to construction activities. Construction activities commonly include removing vegetation, stockpiling topsoil, and constructing roads and shallow excavations, which would contribute to erosion and sedimentation. Cumulative effects to surface water resources would be highest shortly after construction begins and would decrease over time in response to reclamation efforts. BMPs to control erosion would be implemented to ensure that surface disturbing activities have minimal effects on surface water resources.

Land use activities that degrade upland and riparian resources, including activities that increase the occurrence of wildland fires, which can remove upland and riparian vegetation and reduce soil stability, can have an adverse affect on surface water resources through increased overland flow, degradation of the stream channel, and discharges of suspended sediment into receiving streams. Historically, Yakima River basin has been receiving high sediment inputs from sources such as runoff from agricultural lands, particularly irrigation return flows. Most of the agricultural loading of suspended sediment occurs downstream from YTC, although some occurs in the Kittitas Valley and from tributaries west of YTC that drain similar terrain. Other sources of sediment include improperly designed and located roads, degraded channels resulting from mass wasting, and natural erosion processes.

In 1994 and 1995, the Washington Department of Ecology conducted a TMDL evaluation, and in 1998, the EPA approved a Water Cleanup Plan designed to reduce suspended sediments and pesticides in the Yakima River. More recent (2003) Washington Department of Ecology monitoring evaluated the suspended solids loads at the Kiona Station and concluded that the loads have been greatly reduced (by 50 to 70 percent) compared to previous decades (Coffin et al. 2006). Since the 1990s, YTC have conducted several activities, including stabilization of roads and stream crossings, to control erosion and reduce their contribution to sediment to the Yakima River. Local activities to reduce suspended sediment activities resulted in lower total suspended sediment and turbidity values in 2006, compared to 1999 (Washington Department of Ecology 2009).

Cumulative effects to surface water could occur from ongoing and visiting unit training, as well as training activities related to other small arms tracer fire and HIMARS launching. Impacts from maneuver training of visiting units using tracked vehicles would result in greater soil disturbance and would cumulatively increase the potential for sedimentation and erosion in the area. Training by HIMARS field artillery battalions and other units would also increase the potential for impacts to water quality from introduction of chemical constituents, such as munitions residues and accidental spills and leaks, and by increasing the likelihood of igniting fires during rocket launches and use of tracer rounds.

Discharges of suspended solids from YTC, combined with larger natural and agricultural sources, could contribute cumulatively to water quality impairment (sedimentation) of the Lower Yakima River. These impacts have a potential to be significant; however, with the Water Cleanup Plan for Yakima River in place, these impacts would be mitigable to less than significant. As discussed in

Section 5.2, to date, conclusions indicate that sediment loads from YTC contribute only a small fraction of total sediment loads in the Yakima River system.

Potential cumulative effects to Columbia River could result from military training activities combined with implementation of past, present, and reasonably foreseeable future actions. Water quality in Columbia River is considered good and has not been designated as impaired in the vicinity of YTC. Past and present actions include agriculture and recreational activities. The chemicals associated with the fertilizers and pesticides include nitrogen, phosphate, potassium, and numerous other organic compounds. Many of the organic compounds are not persistent in the environment and do not present a water quality concern. Some organic compounds and inorganic nutrients, such as nitrate, do end up in receiving waters such as the Columbia River via erosion of soil particles, surface runoff, or returning irrigation water and can reduce water quality. However, because of the volume of water carried by the Columbia River, chemicals that do reach the river from agricultural practices are highly diluted and, as noted above, Columbia River water quality is considered good (Army 2005a).

Past and reasonably foreseeable future projects that could cumulatively affect water quality in Columbia River include: Grant County Public Utility District and Federal Energy Regulatory Commission relicensing for the operation of dams, construction of a new Pacific Power powerline across YTC, and the recently completed Columbia River Erosion Control project (Army 2005a). Potential cumulative impacts from these projects may result in temporary increase in sediment loads due to construction activities and altered streamflows related to dam operations.

6.2.7.1.2 Groundwater Quantity and Quality

Cumulative effects to groundwater could occur from ongoing and visiting unit training and increased training activities such as those related to the HIMARS launching. Additional training activities would increase the potential to impact shallow groundwater resources from introduction of chemical constituents such as munitions residues and accidental spills and leaks. However, no contaminants related munitions residues have been detected at YTC to date. BMPs would be implemented to ensure these impacts have minimal effects on groundwater resources.

6.2.8 Mitigation

Currently, YTC implements a variety of BMPs to mitigate the effects of the Army's activities on water resources and water quality. These BMPs include repairing areas damaged by maneuvers; limiting activities in the vicinity of streams and wetlands; limiting stream/river crossings; implementing various plans, such as EPPs; and restoring riparian areas (**Table 6-33**). In addition to the BMPs, YTC proposes to implement increased ITAM program maintenance of training lands to minimize effects to water resources and water quality, implement erosion control measures to address sediment delivery to the Yakima and Columbia Rivers following fire events, and conduct site restoration for wildland fire impacts (**Table 6-34**).

6.3 BIOLOGICAL RESOURCES

6.3.1 Vegetation

Three issues pertaining to vegetation were identified during scoping: 1) the effects of increased training activities on rare species and rare habitats on the installation; 2) the potential spread of noxious weed species as a result of Army actions; and 3) the potential for increased fire danger resulting from increased live-fire training use of YTC.

6.3.1.1 Resource-specific Significance Criteria

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

- A long-term loss or degradation of unique or high-quality plant communities;
- A measurable reduction in diversity within high-quality plant communities;
- Take of federally listed species or increased mortality of proposed or candidate plant species; or
- Local extirpation of rare or sensitive species not currently listed under the ESA.

The potential for impacts to be significant depends on the importance of the community or species (ecologically, sociologically, or legally), the magnitude of the impact in relation to the size of the population or community, and the resilience of the plant or community after a disturbance.

In addition to this EIS, a BA was prepared that addresses federally listed threatened and endangered plant species, and species proposed for listing, that could be impacted by the action alternatives (Appendix F).

6.3.1.2 Overview of Impacts to Vegetation by Alternative

Table 6-7 summarizes the impacts on vegetation that would occur under each of the alternatives.

Table 6-7 Summary of Potential Impacts to Vegetation at YTC

Activity Group	Alt 1	Alt 2	Alt 3	Alt 4
Construction Direct and Indirect Effects	€	€	€	€
Live-fire Training Direct and Indirect Effects	U	U	U	U
Maneuver Training Direct and Indirect Effects	€	U	U	U
Cumulative Effects	U	U	U	U

U = Significant Effects
 W = Significant but Mitigable to less than Significant Effects
 € = Less than Significant Effects
 + = Beneficial Effect
 N/A = Not Applicable
 • = No Effects

6.3.1.3 Alternative 1 – No Action Alternative

6.3.1.3.1 Construction Direct and Indirect Effects

6.3.1.3.1.1 Less than Significant Effects

No construction projects are proposed at YTC under Alternative 1. Ongoing facility maintenance and upgrades under Alternative 1 would most likely occur in the cantonment area, where the existing plant communities are highly fragmented and consist of a mixture of native and introduced plant species. A negligible acreage of vegetated land would be affected. Listed and rare species and unique and high quality plant communities would not be affected by these activities. Impacts to vegetation would be minor.

6.3.1.3.2 Live-Fire Direct and Indirect Effects

6.3.1.3.2.1 Significant Effects

Under Alternative 1, impacts to vegetation from fire would likely be significant. The potential effects to vegetation from live-fire training have been analyzed in previous EAs prepared for the two SBCTs and other Fort Lewis units that train at YTC (Army 2001b, 2004b). Although these EAs

predicted less than significant impacts to vegetation under current training levels, wildland fire impacts have increased above predicted levels in the past 5 years due to several factors, including weather conditions and ineffective wildland fire management practices. As a result, YTC staff have determined that recent fire impacts have been significant, and have recently reviewed and made changes to wildland fire management practices to address their overall effectiveness. Under Alternative 1, the area impacted by fire annually would continue to vary depending on weather conditions and the success of fire management measures on the installation. The greatest impacts would occur in shrubland habitats with big sagebrush as a dominant species, or in areas where fire may aid in the spread of cheatgrass or other annual, fire-tolerant weeds. Additionally, fires that burn outside of ranges and other prescribed containment areas would be more likely to damage intact plant communities, and would result in greater impacts to vegetation than fires that burn in areas that are subject to repeated burns, which typically have lower fuel buildup. The degree of impact to vegetation from training-related fires would depend on the acreage burned, the location of the fire, and the effectiveness of fire management programs.

Special status species would continue to be susceptible to fire. Although many areas occupied by special status species have been identified and mapped, and the Army would continue to make an extra effort to protect these areas in the event of a fire, it may not be possible to prevent a fire from harming or killing special status species.

6.3.1.3.3 *Maneuver Training Direct and Indirect Effects*

6.3.1.3.3.1 Less than Significant Effects

The potential impacts to vegetation from maneuver training activities under Alternative 1 were analyzed in previous EAs (Army 2001b, 2004b). These EAs predicted less than significant impacts to vegetation under the existing management policies. Annual off-road mileage by SBCTs is estimated at 370,000 miles under Alternative 1.

The greatest potential for impacts would result from off-road vehicle maneuvers by Strykers, which can cause injury and mortality to vegetation and lead to changes in plant cover, species composition, and structure. In addition, disturbance to vegetation by vehicles is capable of exposing bare soil, thereby opening up pathways for the invasion and establishment of non-native invasive plants, and a corresponding reduction in the cover of native plants. Maneuver training may also compact the soil, causing changes to the rooting zone that reduce plant vigor. It is likely that lasting changes to species composition and community structure would occur in disturbed areas, particularly where big sagebrush was damaged by vehicle maneuvers.

Given the arid growing conditions at YTC, plants are easily damaged and slow to recover. Studies have been done assessing the impacts of LAVs on vegetation at YTC. LAVs are wheeled vehicles that are similar to Strykers and are expected to have a similar effect on vegetation. All general plant community types (shrubland, grassland, and dwarf shrubland) exhibited severe impacts to vegetation structure after a single straight-line pass by an LAV, with little additional degradation resulting from subsequent passes (Jones 2002). Total plant cover was reduced by 60 to 80 percent, with a corresponding increase in bare ground, and notable recovery generally took from 2 to 3 years.

SBCT vehicles typically travel in small groups or clusters. Approximately 80,000 acres (16,187 ha) of training lands are suitable for Stryker off-road training, as Strykers cannot operate safely on slopes greater than 30 percent (Nissen and Kelley 2009).

At YTC, the acreage of terrain suitable and available for off-road maneuver training by support vehicles (i.e., areas open to maneuver training with less than 60 percent slopes) is approximately 225,000 acres (91,055 ha).

Under Alternative 1, vegetation on 11 to 16 percent of the available training lands would continue to be affected annually (**Table 6-8**), with a greater percentage impacted on more level training lands. In terms of land area affected annually, initial impacts would be moderate; however, impacts could be cumulative over time if an additional 11 to 16 percent of training lands were affected each year. Shrubland communities dominated by big sagebrush are expected to exhibit the most severe and lasting impacts, as loss of big sagebrush changes the species composition and community structure, with full recovery rates tied to the germination, regrowth, and reestablishment of sagebrush at the site. Intensive rehabilitation of these sites may be necessary to ensure recovery of these sites after disturbance. Grasslands and dwarf shrub sites are likely to recover from disturbance more quickly than shrublands, although some lasting impacts (including reduction of soil crusts, alteration of species composition, and a spread of invasive species) may also occur at these sites.

Table 6-8 Annual Impacts of Training on Vegetation at YTC

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Approximate acres impacted annually by maneuver activities	24,670 to 37,000	36,000 to 54,000	36,670 to 55,000	38,000 to 57,000
Percent of training lands impacted ¹	11 to 16	16 to 24	16 to 24	17 to 25
Approximate acres impacted annually by digging	~ 50 acres	~ 75 acres	~ 75 acres	~ 75 acres
Acres impacted annually by training-caused fires	Variable: 100s to 1,000s of acres; fewest acres of all alternatives	Variable: 100s to 1,000s of acres; more acres than Alternative 1, fewer acres than Alternative 4	Variable: 100s to 1,000s of acres; similar number of acres to Alternative 2	Variable: 100s to 1,000s of acres; greatest number of acres of all alternatives

Note:

1. Acres impacted as a percentage of acres available for maneuver training by Strykers and other support vehicles. Approximately 80,000 acres (32,375 ha) are suitable for Stryker vehicle training, and an additional 145,000 acres (58,700 ha) of training lands are suitable for support vehicle training. See **Appendix C** for calculations and assumptions.

Under Alternative 1, digging activities would continue to affect less than 50 acres (20 ha) of land on YTC annually, which constitutes a fraction of a percent of the available training land. Impacts at digging sites range from a short-term loss of vegetation to a long-term loss in native vegetation as a result of the mixing of surface and subsurface soils in these areas. Given the area of land impacted by digging relative to the total acreage of land on YTC, the impacts to vegetation from digging should continue to be minor, provided populations of special status plant are avoided.

Special Status Plant Species. Under Alternative 1, impacts to special status plant species would continue to be less than significant, with a continuation of management and monitoring programs to minimize long-term impacts to these species. No federally listed, proposed, or candidate plant species are known to occur on YTC. Other sensitive species that could be impacted by training include gray cryptantha, Columbia milk-vetch, Hoover’s desert-parsley, and Hoover’s tauschia. Gray cryptantha and Hoover’s desert-parsley are found near the Columbia River and outside of designated maneuver corridors. Under Fort Lewis Regulation 420–5, designated sensitive populations of Columbia milk-vetch, Hoover’s tauschia, and other special status species are protected from off-road maneuvers by Seibert staking. However, some populations would continue to be at risk from injury or mortality. Additional management to reduce and offset training-related impacts to sensitive plant species include impact reduction techniques, revegetation of maneuver areas, and fire management

activities, which are discussed in the CNRMP/INRMP and IWFMP (Army 2002b). Local extirpation of these species should not occur, and impacts would remain less than significant.

6.3.1.4 Alternative 2 – GTA Actions

6.3.1.4.1 Construction Direct and Indirect Effects

6.3.1.4.1.1 Less than Significant Effects

Under Alternative 2, the total area impacted by proposed construction projects would be approximately 388 acres (157 ha). Short-term, minor impacts to vegetation would result from the operation of heavy-duty construction equipment, demolition, and increased vehicular traffic attributed to construction personnel. Additionally, a very small amount of vegetation would be lost from clearing of range areas to construct these training facilities. These activities are not expected to affect unique or high quality plant communities. Rare and sensitive plant populations would be considered during project planning and implementation, which would include determining potential impacts to these populations and developing strategies to avoid or mitigate impacts, as needed. Therefore, effects would be less than significant.

6.3.1.4.2 Live-Fire Direct and Indirect Effects

6.3.1.4.2.1 Significant Effects

Given the potential for fire to impact native shrubland habitats and big sagebrush, as well as populations of special status species that are protected from vehicles but not fire, the increase in fire risk under this alternative would constitute a significant effect to vegetation. Despite ongoing fire management programs, it is reasonably foreseeable that range fires could result in a long-term loss or degradation of unique or high-quality plant communities or could cause a local extirpation of a sensitive species.

6.3.1.4.3 Maneuver Training Direct and Indirect Effects

6.3.1.4.3.1 Significant Effects

Under Alternative 2, the types of impacts to native plant communities from maneuver training would be similar to those described for Alternative 1. However, the extent of these impacts would be greater given the increased level of training (off-road mileage would increase to 540,000 miles). There would be a notable increase in the loss of plant cover in areas where off-road maneuvers occur. There are two different training possibilities under this alternative, which would result in different levels of impacts to vegetation, and therefore, different significance determinations. Both possibilities are addressed below.

The first future possibility is that maneuver training would continue to follow the current model of SBCT training on YTC, in which most impacts to vegetation would be concentrated into small areas, rather than widely spread out over the entire installation. Vegetation in assembly areas and other heavily used areas would be most affected, but areas of intact native plant communities would receive minimal impacts. With existing measures in place to reseed and rehabilitate heavily used areas after training exercises, overall effects to vegetation would be less than significant.

The second future possibility is that the area used for maneuver training would increase from the current model, or training needs would change to require more off-road travel in less heavily used available training lands, in which impacts to high-quality native plant communities could potentially be much greater. This possibility would represent a worst-case scenario. Strykers, SBCT support vehicles, and vehicles in GTA units could potentially impact up to 36,000 to 54,000 acres (14,569 to

21,853 ha), or 16 to 24 percent of training lands annually under a worst-case scenario. However, under a more realistic scenario, the area impacted would be less, since support vehicles would often use the same trails as Strykers.

Strykers would impact between 15,333 and 23,000 acres (6,205 and 9,308 ha) annually from off-road travel, an acreage that represents about 2 to 4 vehicle passes on 20 to 29 percent of training lands that are suitable for off-road travel by Strykers. SBCT support vehicles could potentially impact between 20,670 and 31,000 acres (8,365 and 12,545 ha) annually, an acreage that represents about 2 to 4 vehicle passes on between 10 to 15 percent of available training lands for support vehicle training annually. Vehicles in GTA units would impact between 180 and 270 acres (73 and 110 ha), which represents 2 to 4 vehicle passes on less than 1 percent of available training lands annually.

Under this second future possibility, effects to vegetation would potentially be significant. Big sagebrush shrublands would have a greater likelihood of being impacted by maneuver training than under Alternative 1, and the spread of non-native species would be likely to increase. As a result, lasting changes in community structure and species composition would likely occur over a greater area than under Alternative 1. Additionally, it is possible there would be a decrease in the rest and rotation of some training lands after a disturbance, as compared to Alternative 1. Relatively level training lands with a slope of 30 percent or less would likely be most at risk for repeat disturbance. Effects to vegetation in these communities would be significant because restoration of these communities would require extensive, long-term efforts beyond reseeding and/or rehabilitation after training exercises.

Under Alternative 2, the amount of digging on YTC annually would increase from about 50 acres to 75 acres (20 to 30 ha). This acreage would still represent a negligible amount of available training land, and impacts would continue to be minor, provided populations of sensitive plant species continue to be avoided.

Special Status Plant Species. A BA developed in conjunction with this EIS determined that the proposed actions would have no effect on federally listed plant species, or species proposed for listing. Other sensitive plant species would continue to receive some protection from maneuver training by Seibert staking their location outside of maneuver corridors. However, the substantial increase in off-road miles and total vehicle miles under this alternative would increase the likelihood that unprotected populations of special status species would be impacted by vehicles during training activities, or that Soldiers would inadvertently enter protected areas. The existing protection of sensitive plant species would continue to minimize the risk of local extirpations, and effects would be minor to moderate, depending on the rate of disturbance and the ability of populations to recover.

6.3.1.5 Alternative 3 – GTA Actions + CSS Soldiers

6.3.1.5.1 Construction Direct and Indirect Effects

6.3.1.5.1.1 Less than Significant Effects

Under Alternative 3, impacts to vegetation from construction would be the same as those discussed under Alternative 2. No additional construction projects are proposed under Alternative 3.

6.3.1.5.2 Live-Fire Training Direct and Indirect Effects

6.3.1.5.2.1 Significant Effects

The CSS units engage in a minimal amount of live-fire training; thus, the number of potential ignition sources utilized in the ranges and impact areas on YTC would be slightly greater than those

under Alternative 2. Consequently, the risk of fire and effects to vegetation would also be slightly greater than under Alternative 2.

6.3.1.5.3 Maneuver Training Direct and Indirect Effects

6.3.1.5.3.1 Significant Effects

Under Alternative 3, annual off-road travel by vehicles would increase to approximately 550,000 miles, and would result in greater damage to plant communities than under Alternative 2. As discussed under Alternative 2, under the first future possibility of continued training in localized areas by the SBCTs, GTA units and CSS units, effects to vegetation would be limited to high use areas, with low impacts to much of the high quality sagebrush habitat on the installation. With existing measures in place to reseed and rehabilitate heavily used areas after training exercises, overall effects to vegetation would be less than significant.

Under the second future possibility, in which more of the available training land would be required to support training by the new units, impacts to vegetation would be significant. CSS vehicles could potentially impact between 335 and 500 acres (135 and 200 hectares; **Table 6-8**) annually, although not all of these acres would be additive to those impacted by SBCT vehicles, given overlap in use of certain areas. Assuming equal use of all available maneuver areas, SBCT, GTA, and CSS vehicles could potentially impact approximately 16 to 24 percent of YTC training lands annually. Impacts to vegetation associated with this alternative would not be substantially different than those under Alternative 2, although impacts to big sagebrush shrublands and the potential for spread of non-native species would potentially be greater. Effects to vegetation would be significant.

The number of annual digging events and impacts associated with digging on YTC would remain near levels identified under Alternative 2. Therefore, associated effects to vegetation would be similar to those described for Alternative 2.

Special Status Plant Species. A BA developed in conjunction with this EIS determined that the proposed actions under Alternative 3 would be unlikely to adversely affect federally listed plant species, or species proposed for listing that occur on or near YTC. Under Alternative 3, the risk for impacts to sensitive plant species would be slightly greater than under Alternative 2. However, the existing protection measures would be adequate to prevent local extirpations of these species, and effects would be less than significant.

6.3.1.6 Alternative 4 – GTA Actions + CSS Soldiers + Medium CAB

6.3.1.6.1 Construction Direct and Indirect Effects

6.3.1.6.1.1 Less than Significant Effects

Under Alternative 4, impacts to vegetation from construction would be the same as those under Alternatives 2 and 3. No additional construction projects are proposed under Alternative 4.

6.3.1.6.2 Live Fire Training Direct and Indirect Effects

6.3.1.6.2.1 Significant Effects

The additional gunnery training conducted by the medium CAB at YTC would likely increase the risk of fire and result in a greater number of ignitions occurring on YTC annually than under the other alternatives. Despite ongoing fire management programs, effects to native plant communities and sensitive species would constitute significant adverse effects.

6.3.1.6.3 Maneuver Training Direct and Indirect Effects

6.3.1.6.3.1 Significant Effects

Under Alternative 4, annual off-road travel by vehicles would increase to approximately 570,000 miles, resulting in greater impacts to vegetation in maneuver areas than under Alternatives 1, 2, and 3. Under one future training possibility, in which training would continue to be concentrated in localized areas by all the units under this alternative, effects to vegetation would be limited to high use areas and, minimized by reseeding/rehabilitation efforts after training. Provided intact native communities were subject to minimal off-road disturbance, effects would be less than significant.

Under the second future training possibility, in which more of the available training land would be required to support training by the new units, impacts to vegetation would be significant. Medium CAB vehicles could potentially impact between 1,170 and 1,750 acres (475 and 710 ha) annually, with approximately 17 to 25 percent of training lands impacted annually by all training vehicles under this alternative. Overall, the potential for degradation of big sagebrush shrublands and other native plant communities would be greater under this alternative than under any of the other alternatives. Effects to vegetation would be significant.

Helicopter-based activities by the medium CAB would occur in the YTC airspace, and therefore would have minimal, if any, impacts on vegetation. It is not anticipated that medium CAB units would conduct extensive digging activities. Ground activities would typically occur in hardened areas and areas where impacts to vegetation have recurred in the past and high-quality native plant communities and sensitive species do not occur.

Special Status Plant Species. The BA for this action determined that proposed activities under Alternative 4 would have no effect on federally listed plant species or species proposed for listing. The risk for impacts to sensitive plant species would be greater under Alternative 4 than under any of the other alternatives. However, the existing protection measures would be adequate to prevent local extirpations of these species, and effects would be less than significant.

6.3.1.7 Cumulative Effects

6.3.1.7.1 Significant Effects

Cumulative effects would be significant under Alternatives 1, 2, 3, and 4. Significant, adverse cumulative impacts to vegetation on YTC, and moderate, adverse cumulative impacts to vegetation in the Interior Columbia River Basin, would be expected. Vegetation on YTC has been degraded by past and present construction and military training activities. As discussed above, continued training and proposed increases in training would likely further impact vegetation.

Natural and man-caused fires burn several thousand acres annually on YTC. Much of this acreage is accounted for by grassland communities in ranges and other containment areas, where fires are recurrent, low-fuel burns that are relatively easy to suppress. These areas may include a high proportion of non-native grasses. Larger fires are typically one-time burns in other areas on the installation, often shrublands with heavy fuels that are more difficult to control and that typically convert to grassland communities as a result of fire.

Other past, present, and future activities that could contribute to regional loss of native vegetation include residential, recreational, and commercial development and agricultural activities (including farming and ranching). Prior to European settlement, eastern Washington was covered by an almost unbroken, 10.4 million acre (4.2 million ha) expanse of shrub-steppe habitat (Dobler 1992). Agricultural, rangeland, residential, and commercial development have reduced the amount of shrub-steppe habitat to 4.2 million acres (1.7 million ha), much of it now occurring in small, widely

scattered parcels. Currently, YTC lies within the largest remaining contiguous block of shrub-steppe habitat in Washington (Army 2002b). Mitigation proposed in this EIS, continued implementation of upland vegetation management efforts included in the CNRMP/INRMP, ongoing rehabilitation/restoration activities, and regional efforts to protect remaining shrub-steppe habitat would help maintain and protect native plant communities and sensitive plant species on YTC and in the region.

6.3.1.8 Mitigation

6.3.1.8.1 Ongoing Mitigation

As discussed in **Table 6-33**, the Army currently implements numerous management activities and other resource protection strategies to minimize impacts to vegetation on YTC. These activities would continue to occur, regardless of the EIS alternative selected. These ongoing activities would help to mitigate for some of the impacts associated with the proposed activities under Alternatives 2, 3, and 4. A list of some of these measures that would help mitigate for impacts to vegetation, including native shrub-steppe communities and special status species, is presented below. Proposed new mitigation is presented in **Section 6.3.1.8.2**.

- Continue to follow resource protection measures required by Fort Lewis Regulation 200-1 during field training, such as: avoiding maneuver, digging, or establishing assembly areas or bivouac sites in Seibert staked areas; using only established roads and trails during movement to and from maneuver areas and firing ranges; staying at least 50 meters from wetlands and other water bodies unless a maintained road or designated crossing exists for traversing the restricted area; obtaining a permit for digging, and digging only in the area specified by the permit; locating assembly areas, bivouac sites, field refueling sites, field maintenance sites, field kitchens, field showers, field latrines, and hazardous material storage sites at least 100 meters away from any wetland or water body; and conducting vehicle washing only at installation-designated wash facilities.
- Continue to implement the requirements of Fort Lewis Regulation 420-5, which includes protecting designated sensitive plant sites through Seibert staking to protect populations of Columbia milk-vetch, basalt daisy, dwarf evening-primrose, Hoover's desert parsley, Hoover's Tauschia, kalm's lobelia, and white eatonella.
- Continue to implement management practices in line with goals and objectives identified in the ITAM program. These measures include, but are not limited to: promoting vehicle traffic on established roads and away from maneuver-created trails; maintaining recognized roads; repairing (reseeding) maneuver damaged areas; use of land condition data when planning training that may impact soils or vegetation; and Seibert stake protection of sensitive resources.
- Continue to conduct Sustainable Range Awareness training for all units training at YTC to educate them about the importance of minimizing the damage caused to vegetation by off-road travel.

Ongoing protection measures for sensitive plant species on YTC include protection of habitat through the Zone 1 land use designation (no off-road vehicle use or digging; includes 374 acres [151 ha] of sensitive plant habitat), and Seibert-staked sensitive plant habitat (11 acres [4 ha]). Additionally, a Sensitive Plant Management Plan presents management prescriptions and actions for sensitive plant species on the installation, including population monitoring, periodic surveys for new or previously unidentified populations, and considering potential impacts to sensitive plants during project planning.

6.3.1.8.2 Proposed New Mitigation

Long-term loss or degradation of unique or high-quality plant communities, and a measurable reduction in diversity within high-quality plant communities, would be likely under Alternatives 1, 2, 3, and 4. The following mitigation is proposed to help reduce impacts to native plant communities as a result of fire and maneuver training damage (**Table 6-34**):

- Implement increased ITAM program maintenance of sustainable training lands. Actions will include rehabilitating vegetation impacted by vehicle maneuvers, bivouac, digging, and other training activities; Seibert stake protection of sensitive areas; and installation/repair of low water crossings in areas of riparian and wetland soils. Conduct increased sustainable range awareness training. Conduct increased frequency of soil condition monitoring and reporting.
- Implement fire mitigation to reduce fire-related impacts to vegetation, as listed below (these measures are described in more detail in **Section 6.5.8**).
 - Establish wildland fire containment areas.
 - Establish fire exclusion areas.
 - Develop and maintain pre-incident plans for designated locations or activities.
 - Conduct periodic review and refinement of the Wildland Fire Risk Matrix.
 - Implement temporal constraints and other training restrictions during the high fire danger period (15 May through 30 September).
 - Provide additional Range Inspectors.
 - Increase wildland fire staffing.
 - Provide wildland fire suppression equipment.
 - Continue aerial fire suppression capability.
 - Develop additional water resources for fire suppression.
 - Conduct firebreak update and maintenance.
 - Conduct site restoration for wildland fire impacts (efforts are estimated at 9,500 acres annually over the first 5 years and on 6,300 acres annually thereafter).
 - Continue to implement the Training Land Recovery Program.

Additionally, some of the measures developed to mitigate for impacts to sage-grouse (listed in **Section 6.3.3.8.2**), particularly those directed at protecting or rehabilitating habitat, would also provide mitigation for impacts to shrub-steppe communities on YTC.

6.3.1.9 Conclusions

Significant impacts to plant resources would occur under the action alternatives as a result of increased fire risk and increases in the number of off-road vehicle miles allowed on YTC each year. Training-related impacts would be lowest under Alternative 1 and highest under Alternative 4. The general management approach outlined in the CNRMP/INRMP would be followed under all the action alternatives and revisions would be made to vegetation management plans to help reduce the level of impact under Alternatives 2, 3, and 4. Additional mitigation to minimize fire risk, restore fire-damaged areas, increase maintenance of sustainable training lands, and protect and rehabilitate some shrub-steppe communities is proposed.

6.3.2 Fish and Aquatic Resources

6.3.2.1 Resource-specific Significance Criteria

Effects to fish and other aquatic resources were not identified as an issue of concern during scoping. For the purposes of this analysis, impacts to fish resources on YTC would be considered significant if Army actions resulted in:

- A take of a federally listed species or a species proposed for listing;
- A loss of designated critical habitat;
- A long-term (greater than 2-year) impact on populations and/or habitat of federal or state species of concern that would result in a trend toward endangerment or the need for federal listing;
- A long-term loss of habitat for single or multiple common fish species; or
- A creation of a fish barrier.

In addition to this EIS, a BA and EFH assessment have been prepared that address federally listed threatened and endangered species, and species proposed for listing, that could be impacted by the action alternatives, and impacts that could occur to EFH (**Appendix F**).

6.3.2.2 Overview of Impacts to Fish and Aquatic Resources by Alternative

Table 6-9 summarizes the impacts associated with fish and aquatic resources that would occur under the alternatives.

Table 6-9 Summary of Potential Impacts to Fish and Aquatic Resources at YTC

Activity Group	Alt 1	Alt 2	Alt 3	Alt 4
Construction Direct and Indirect Effects	€	€	€	€
Live-fire Training Direct and Indirect Effects	€	€	€	€
Maneuver Training Direct and Indirect Effects	€	€	€	€
Cumulative Effects	€	€	€	€

U = Significant Effects
 W = Significant but Mitigable to less than Significant Effects
 € = Less than Significant Effects
 + = Beneficial Effect
 N/A = Not Applicable
 • = No Effects

6.3.2.3 Alternative 1 – No Action Alternative

6.3.2.3.1 Construction Direct and Indirect Effects

6.3.2.3.1.1 Less than Significant Effects

No construction projects are proposed at YTC under Alternative 1. Ongoing facility maintenance and upgrades that would continue to occur at current levels under Alternative 1 would follow federal, state, and local regulations; erosion BMPs; and SPCCPs in order to minimize the risks of sedimentation into or contamination of aquatic habitats on the installation. Therefore, overall impacts of construction activities on aquatic habitats and species would be minor.

6.3.2.3.2 *Live-Fire Training Direct and Indirect Effects*

6.3.2.3.2.1 Less than Significant Effects

Potential impacts to fish resources associated with live-fire training under Alternative 1 have been analyzed in previous EAs prepared for the SBCTs and other units stationed at Fort Lewis that train at YTC (Army 2001a, 2001b, 2004a, 2005a). These previous evaluations found that effects to fish resources from live-fire training would be less than significant. Gunnery training may have an indirect impact on fish by causing fires, which temporarily remove vegetation and organic matter from a site, contributing to runoff and sedimentation into aquatic habitats. Fires have the potential to spread to riparian habitats, where loss of vegetation in riparian buffer zones is likely to destabilize stream banks and lead to erosion and sedimentation into aquatic habitats. In addition, temperature increases caused by defoliation can harm fish. The risk of these impacts would continue to be reduced by fire management programs on YTC, as well as noxious weed control programs.

6.3.2.3.3 *Maneuver Training Direct and Indirect Effects*

6.3.2.3.3.1 Less than Significant Effects

Under Alternative 1, there would not be any major changes in the types and amounts of training occurring at YTC. Therefore, potential impacts to fish and other aquatic organisms from maneuver training activities would not increase from those identified in previous EAs (Army 2001a, 2001b, 2004a, 2005a). These documents predicted minor impacts to fish and other aquatic organisms under the existing management policies. Annual off-road mileage by SBCTs would be approximately 370,000 miles.

Off-road vehicle travel and digging activities would continue to have a minor adverse impact on fish habitat by potentially contributing to erosion and stream sedimentation, aiding the spread of noxious weeds into riparian areas, altering stream flows and temperatures, and limiting the development of coarse woody debris and other structural components of aquatic habitats (Army 2002b). The amount that training-related events alter water quality and aquatic habitats on the installation is currently unknown, but it is likely that training activities would have a minor impact on fish by contributing to impacts to water quality during runoff events. River crossing and stream fording activities would continue at current levels. These activities can lead to erosion and compaction of stream banks, sedimentation, and disturbance, release of vehicle materials (e.g., fuels and oils) into water bodies, and injury or mortality to any fish that are present at the crossing. All major stream crossings on YTC have been hardened or upgraded to minimize impacts to water quality and fish resulting from erosion.

Special Status Fish Species. Federally listed species that occur in the vicinity of YTC include the Upper Columbia River Spring-run Chinook salmon ESU and the Upper Columbia and Mid-Columbia River Steelhead trout ESUs (along either the Yakima or Columbia Rivers), although only Upper Columbia River steelhead has been observed in streams on YTC. Listed salmonids spawn in the nearby Yakima and Columbia Rivers, where spawning habitat could be indirectly affected by sedimentation originating in streams on YTC. Current data indicate that sediment loads from YTC contribute a small fraction of total sediment loads in the Columbia River and Yakima River systems.

Under Alternative 1, impacts to fish would continue to be less than significant, as YTC would continue to protect and improve fish habitat through aquatic buffers, stream restoration projects, erosion control practices, and noxious weed management.

6.3.2.4 Alternative 2 – GTA Actions

6.3.2.4.1 Construction Direct and Indirect Effects

6.3.2.4.1.1 Less than Significant Effects

Under Alternative 2, proposed construction includes two range projects located outside of the cantonment area and away from water bodies (**Figure 2–5**), although intermittent streams pass through the area that could discharge suspended solids to Selah Creek and eventually the Yakima River. These effects to aquatic habitat would be limited to the active construction phase, and construction activities would follow federal, state, and local regulations; erosion BMPs; and SPCCPs in order to minimize the risks of sedimentation into or contamination of aquatic habitats on YTC. Therefore, risks to fish species would remain low, and effects would be less than significant.

6.3.2.4.2 Live-Fire Training Direct and Indirect Effects

6.3.2.4.2.1 Less than Significant Effects

Under Alternative 2, the amount of live-fire training on YTC would be greater than under Alternative 1. The degree of impact to aquatic habitats and fish would continue to depend on the amount of vegetation burned from resulting fires and whether a fire enters a riparian buffer area. Ongoing fire management programs would continue to minimize the risk of large fires, but would be unable to eliminate such a risk completely. Burned riparian habitat could constitute a short-term, adverse effect to aquatic habitats, with an indirect effect on fish species, but would be unlikely to have population level effects or affect aquatic habitats over the long-term. Therefore, effects to fish resources would be less than significant.

6.3.2.4.3 Maneuver Training Direct and Indirect Effects

6.3.2.4.3.1 Less than Significant Effects

Under Alternative 2, annual off-road mileage would increase to 540,000 miles. Additionally, there would be an increase in stream fording activities. These increases would result in a higher risk of aquatic habitats being degraded by sedimentation, runoff, channel incision, and stream bank erosion over the short-term than under Alternative 1. Although it is difficult to measure the extent of training impacts relative to those caused by natural variations in hydrology and weather, there may be a small decline in fish habitat on the installation associated with increased off-road miles. Increases in stream fording activities would increase the risk that fish in crossings would be harmed, and the frequency that sediments or automotive materials would enter the waterway during crossings. Given the presence of hardened crossings at fording sites, and the intermittent nature of most of the streams on YTC, associated impacts would be minor. No barriers to fish migration would be created as a result of training activities by the SBCTs.

Special Status Fish Species. A BA and EFH prepared in conjunction with this EIS determined that activities associated with Alternative 2 may affect, but are not likely to adversely affect, listed fish species in the project area (**Appendix F**). Given that listed fish species are rarely found on YTC, and are not known to spawn on the installation, increases in runoff and sedimentation that degrade fish habitat on YTC would be unlikely to affect these species significantly. Sediment originating on the installation could reach spawning habitat in the Columbia and Yakima Rivers, but would continue to contribute only a fraction of the total sediment loads in these rivers. Therefore, impacts to fish habitat off the installation, including EFH, and to listed species, would be minor under Alternative 2.

6.3.2.5 Alternative 3 – GTA Actions + CSS Soldiers

6.3.2.5.1 Construction Direct and Indirect Effects

6.3.2.5.1.1 Less than Significant Effects

Under Alternative 3, impacts to aquatic organisms and their habitats from construction projects would be the same as those discussed under Alternative 2. No additional construction projects are proposed under Alternative 3.

6.3.2.5.2 Live-Fire Training Direct and Indirect Effects

6.3.2.5.2.1 Less than Significant Effects

Under Alternative 3, the risk of fire would also be greater than under Alternative 2, as would the potential risk of a large fire burning into a riparian area and affecting aquatic habitat. These risks would be minimized by fire management programs, but aquatic habitats could still be impacted. A riparian fire would be unlikely to have population-level effects or affect aquatic habitats over the long-term. Therefore, effects to fish resources would be less than significant.

6.3.2.5.3 Maneuver Training Direct and Indirect Effects

6.3.2.5.3.1 Less than Significant Effects

Under Alternative 3, annual off-road travel would increase to approximately 550,000 miles, and would be associated with a greater risk of aquatic habitat degradation than under Alternatives 1 and 2. It is also likely that there would be an increase in the frequency of stream fording activities, which could be associated with an influx of sediments and/or automotive wastes. Given the presence of riparian buffers, hardened crossings at fording sites, and the intermittent nature of most of the streams on YTC, associated impacts would not be significant. No barriers to fish migration would be created as a result of training activities by the SBCTs, GTA, and CSS units.

Special Status Fish Species. A BA and EFH developed in conjunction with this EIS determined that the proposed actions under Alternative 3 would be unlikely to adversely affect listed fish species (**Appendix F**). The amount of sediment originating on the installation would likely be greater than the amount generated under Alternative 2, and could reach spawning habitat in the Columbia and Yakima Rivers, but would continue to contribute only a fraction of the total sediment loads in these rivers. Impacts to fish and aquatic resources would be less than significant under Alternative 3.

6.3.2.6 Alternative 4 – GTA Actions + CSS Soldiers + Medium CAB

6.3.2.6.1 Construction Direct and Indirect Effects

6.3.2.6.1.1 Less than Significant Effects

Under Alternative 4, impacts to aquatic organisms and their habitats from construction projects would be the same as those discussed under Alternatives 2 and 3. No additional construction projects are proposed under Alternative 4.

6.3.2.6.2 Live-Fire Training Direct and Indirect Effects

6.3.2.6.2.1 Less than Significant Effects

The additional live-fire training conducted by the medium CAB at YTC would likely increase the risk of fire and result in a greater number of fires occurring on YTC annually than under the other alternatives. The potential effects to fish and aquatic habitats would be similar to those described

under Alternatives 2 and 3. A riparian fire would be unlikely to have population-level effects or affect aquatic habitats over the long-term. Effects to fish resources would be less than significant under Alternative 4.

6.3.2.6.3 Maneuver Training Direct and Indirect Effects

6.3.2.6.3.1 Less than Significant Effects

Under Alternative 4, annual off-road vehicle travel would increase to approximately 570,000 miles, and would be associated with a greater risk of aquatic habitat degradation (and therefore indirect effects to fish) than under Alternatives 1, 2, and 3. Impacts associated with vehicle maneuver training would be similar to those discussed under Alternatives 1 and 2, but the associated risk would be greater. The additional off-road miles driven by medium CAB vehicles annually would result in increased risks of habitat degradation through sedimentation, runoff, channel incision, stream bank erosion, and release of vehicle pollutants.

Because medium CAB vehicles would not typically cross water bodies, risks to fish and aquatic habitats associated with stream fording would be the same as under Alternative 3.

Spill control plans and buffers between aquatic habitats and sites of ground training, and between aquatic habitats and sites of helicopter takeoff and landing, would protect aquatic resources on the installation. No barriers to fish migration would be created as a result of training activities by the medium CAB. Therefore, effects to aquatic species would be less than significant.

Special Status Fish Species. A BA and EFH developed in conjunction with this EIS determined that proposed activities under Alternative 4 would be unlikely to adversely affect threatened or endangered fish species that occur on or near the installation (**Appendix F**). Riparian buffers would continue to minimize the risks to these species.

6.3.2.7 Cumulative Effects

6.3.2.7.1 *Less than Significant Effects*

Cumulative effects would be less than significant. Short- and long-term, minor, adverse cumulative impacts to fish would be expected from past, present, and future actions within the Interior Columbia River Basin. These actions have contributed and will contribute to reduced water flows and pollution of fish habitat. Reduced water flows and dams in the Yakima River and Columbia River have limited salmonid access to the upper portions of these rivers and the Snake River. Erosion, sedimentation, and pollution associated with construction and training can also adversely impact fish habitat. Military training activities conducted by all units that use YTC lands for training would cumulatively impact water quality.

Residential and commercial development, road construction, and agricultural practices have impacted water quality and flows within the Interior Columbia River Basin. Since the early 1900s, many wetlands have been drained or diked, and streams channelized to promote conversion of these lands to agricultural or other uses. Although laws exist to protect wetlands and streams, and several large wetland creation projects have been completed by Ducks Unlimited, the Yakama Nation, and other public and private groups, loss of these habitats continues in the region.

Impacts to fish from habitat loss can be substantial, but these impacts have been mitigated by aggressive efforts in recent years by the Army, government agencies, conservation groups, and citizens to protect and enhance fish habitat on and near YTC. The Army has removed invasive vegetation and used plantings to restore riparian and wetland vegetation in several creeks. The Army

also limits off-road vehicle activity near water bodies. In accordance with AR 200–1, YTC will develop a salmonid endangered species management plan to guide the protection and management of endangered and threatened salmon species that use the installation now or in the future.

Rehabilitation and restoration work has also been conducted on other aquatic bodies in the region. Beaver removal efforts have helped to keep waterways free-flowing. Sediment and water retention ponds are routinely constructed in new developments to trap pollutants while allowing storm water to recharge the groundwater. Ducks Unlimited, WDFW, the Yakama Nation, and other groups have teamed to create new freshwater habitats for use by fish and wildlife. These wetlands serve as important nursery, feeding, and resting grounds for an abundance of freshwater fish. Hatcheries have been constructed by WDFW to provide fish to the Yakima and Columbia Rivers, and the U.S. Army Corps of Engineers, and local counties have been active in trying to reduce the juvenile salmon mortality associated with hydropower facilities.

6.3.2.8 Mitigation

The analysis of the direct, indirect, and cumulative effects for the four alternatives concludes that the effects on aquatic resources are less than significant. Therefore, no new or additional mitigation is necessary to avoid, limit, repair, reduce, or compensate for the adverse effects. However, mitigation measures to minimize soil erosion (**Section 6.1.8**) and to reduce fire-related impacts (**Section 6.5.8**), would help to protect aquatic habitats on YTC and minimize risks to fish species associated with increased training under the action alternatives.

6.3.2.9 Conclusions

Increased training maneuvers off road and on unimproved roads, as well as helicopter training, would likely result in minor impacts to fish under the action alternatives. Impacts would be related to the amount of training. The primary impacts associated with off-road driving are increased soil compaction and temporary removal of vegetation, leading to increased runoff from sites on which maneuver training occurs. The potential impact to federally listed species as a result of training would be minor under all alternatives. These species rarely use streams on YTC, and sedimentation from YTC into the Yakima and Columbia Rivers would continue to be minimal. Under all alternatives, restoration projects and other management activities would continue to improve degraded aquatic habitats on YTC.

6.3.3 Wildlife Resources

YTC provides habitat for more than 240 species of wildlife including several species of concern (Army 2002b). During scoping, the public expressed concern about the potential impacts to wildlife from increased hunting pressure, especially on deer and elk; the effects of increased training activities at YTC on rare species and habitats on the installation; and the potential for increased fire danger resulting from increased live-fire training use.

Wildlife resource management on YTC focuses on a group of wildlife species of concern: the bald eagle, the greater sage-grouse, passerine and upland game birds, raptors, and big game species. In addition, YTC has identified shrub-steppe, riparian, and rare and sensitive areas as habitats that support all native and desirable non-native wildlife species on the installation. Therefore, impacts to these species and habitats are of particular importance in this EIS.

6.3.3.1 Resource-specific Significance Criteria

For the purposes of this analysis, impacts to wildlife would be considered significant if Army actions resulted in:

- A substantial, long-term (greater than 2 years) reduction in the quantity or quality of habitat critical to the survival of local populations of common wildlife species;
- Injury or mortality to common wildlife species, such that species populations would not recover within 2 years;
- A reduction in the population, habitat, or viability of a federal or state species of concern or sensitive species that would result in a trend toward endangerment or the need for federal listing;
- Any loss of critical habitat, or nesting habitat critical to birds under the Migratory Bird Treaty Act, on the installation; or
- Mortality to a listed species or species proposed for listing that could result in a “take” under the ESA.

In addition to this EIS, a BA has been prepared that addresses federally listed threatened and endangered species, or species proposed for listing, that could be impacted by the action alternatives (**Appendix F**).

6.3.3.2 Overview of Impacts to Wildlife Resources by Alternative

Table 6-10 summarizes the impacts on wildlife resources that would occur under each of the alternatives.

Table 6-10 Summary of Potential Impacts to Wildlife Resources at YTC

Activity Group	Alt 1	Alt 2	Alt 3	Alt 4
Construction Direct and Indirect Effects	€	€	€	€
Live-fire Training Direct and Indirect Effects	€	U	U	U
Maneuver Training Direct and Indirect Effects	€	U	U	U
Cumulative Effects	€	U	U	U

U = Significant Effects

W = Significant but Mitigable to less than Significant Effects

€ = Less than Significant Effects

+ = Beneficial Effect

N/A = Not Applicable

• = No Effects

6.3.3.3 Alternative 1 – No Action Alternative

6.3.3.3.1 Construction Direct and Indirect Effects

6.3.3.3.1.1 Less than Significant Effects

Under Alternative 1, no construction projects are proposed at YTC. Ongoing facility maintenance and upgrades would continue to occur at current levels under Alternative 1. These activities would have short-term, minor effects on wildlife.

6.3.3.3.2 *Live-Fire Training Direct and Indirect Effects*

6.3.3.3.2.1 Less than Significant Effects

Under Alternative 1, the risk of fire resulting from gunnery training and other activities would continue at current levels (see **Section 5.5.2**), with corresponding risks to wildlife. It is expected that impact areas and adjacent areas would continue to be most susceptible to burning. In the past 20 years, more than one-fourth of the acreage on YTC has burned, leading to substantial alteration of habitat. Fires would cause some mortality to wildlife, although many animals would be able to flee from fire. More sedentary species, such as small mammals and ground-nesting birds, would continue to be at risk for injury or mortality from fires. Additionally, wildlife habitat would be impacted by fire. Fire is an integral part of the shrub-steppe ecosystem, and a factor under which plant and animal communities have evolved. However, there has been a substantial increase in fire during the last 100 years, with the result that grassland communities, including fire-intolerant weeds, have replaced shrubland communities in many burned areas (Army 2002b). In addition, crested wheatgrass and other non-native species have been used to control erosion and stabilize the soil in burned and other disturbed areas. This practice has provided good ground cover and site stability, but has provided little habitat for wildlife.

6.3.3.3.3 *Maneuver Training Direct and Indirect Effects*

6.3.3.3.3.1 Less than Significant Effects

The potential impacts to wildlife from training activities under Alternative 1 were analyzed in the previous EAs prepared for the SBCTs and other Fort Lewis units that train at YTC (Army 2001b, 2004b). These EAs predicted minor impacts to wildlife under the existing management policies.

Under this alternative, there would be no major changes in the types and amounts of training occurring on YTC. Off-road vehicle travel and the incidence of fire and digging activities would remain much the same as at present. Annual off-road mileage by SBCTs would be approximately 370,000 miles. Approximately 24,670 to 37,000 acres (9,984 to 14,973 ha) of wildlife habitat could be affected annually.

Direct impacts to wildlife in the form of injury and mortality would occur as a result of off-road vehicle movements. Behavioral impacts resulting from training-related noises would cause wildlife to disperse, and could alter wildlife access to food, water, and cover during portions of the day and night during training. Gladwin et al. (1988) noted that wildlife are startled by artillery noise, but soon resume their normal behavior. Because training has been ongoing at YTC for decades, it is likely that some resident and migratory species that utilize the installation have adapted to these activities; therefore, impacts to these species would be minor. It is expected that impacts to species that are less tolerant of noise and human activity would be moderate.

Impacts to vegetation from off-road vehicle travel, discussed in **Section 6.3.1.3.3.1**, would indirectly affect wildlife by altering habitat. Alternative 1 would continue to result in impacts to 11 to 16 percent of the available training lands, and a greater percentage of the more level training lands, annually.

In some areas, impacts would last a few years, but could last longer if the site was re-disturbed. Use of the same areas in multiple years would increase the time required for the site to recover from a disturbance. It is expected that, while some areas would be able to recover to near pre-disturbance conditions, others would suffer lasting impacts in the form of altered community structure (e.g., shrubland converted to grassland) or species composition (e.g., non-native species replacing native species on a site). The loss of shrubland structure and complexity reduces the number of niches

available to wildlife, while non-native grasses and forbs are often less palatable to wildlife and provide inadequate cover.

Special Status Wildlife Species. The potential impacts to wildlife special status species from training were evaluated in BAs prepared for the two SBCTs and other units stationed at Fort Lewis, but that train at YTC (Army 2001a, 2004a, 2005b, 2009). Species of concern most likely to be affected by SBCT training include greater sage-grouse, the bald eagle, several species of hawk, and the burrowing owl. Impacts to these species would be minor. FTL Regulation 420–5 limits the types of vehicle and flight activities that can occur in this area. Maneuver and other off-road vehicle activities are prohibited in sage-grouse protection areas (SGPAs) and near leks from March 1 through June 15, which affords protection to breeding and nesting adults and their offspring during spring. Throughout the rest of the year, bivouacking and excavations are not permitted in SGPAs, and maneuver training is limited. Maneuver activities near Hanson Creek and the Columbia River have the potential to disturb foraging and roosting eagles. Noise and human disturbance can affect hawk nesting and foraging activities, but nests often are located in rock outcrops where Stryker vehicles are unlikely to travel, and military activities are prohibited within 1,640 feet (500 m) of ferruginous hawk nests. Although burrowing owls are rare on the installation, their burrows are susceptible to collapse from military vehicles; when found, nest sites are protected from military activity with Seibert stakes. With these protective measures in place, effects to special status species should continue to be less than significant.

6.3.3.4 Alternative 2 – GTA Actions

6.3.3.4.1 Construction Direct and Indirect Effects

6.3.3.4.1.1 Less than Significant Effects

Under Alternative 2, wildlife found near construction sites would be impacted by noise associated with equipment and vehicles. However, there are already high levels of human activity and noise in the vicinity of the YTC training areas to which some of the more tolerant wildlife species have adapted. Although the proposed construction areas overlay that SGPA, including a lek buffer, disturbance effects would be minimized by guidance that construction activities within the SGPA must be accomplished outside the nesting and brood rearing period to the greatest extent possible. Wildlife could also be impacted by fuel spills associated with construction activities and equipment. As these spills would be cleaned up immediately, impacts to wildlife would be minor. Construction activities would follow federal, state, and local regulations; erosion BMPs; and SPCCPs in order to minimize the risks of sedimentation into or contamination of wildlife habitats on the installation. Therefore, overall impacts of construction activities on wildlife, including species of concern, would be minor.

6.3.3.4.2 Live-Fire Training Direct and Indirect Effects

6.3.3.4.2.1 Significant Effects

Gunnery activities would produce short, loud blasts that could startle nearby wildlife, temporarily interfering with their activities. Because some wildlife on the installation have habituated to occasional loud noises at impact areas, an increase in the frequency of these loud noises would not be expected to have significant effects on wildlife populations. Species that currently avoid the installation because of the existing levels of noise would continue to do so.

Ongoing fire management programs would continue to minimize the risk of large fires, but would be unable to eliminate such a risk completely. It is expected that there would be more fire-related mortality under this alternative than under Alternative 1. However, the greatest impact to wildlife

would be loss and degradation of habitat. Sagebrush obligates, such as greater sage-grouse, would be the most affected by the increased fire potential on YTC.

Fire is a threat to sagebrush communities and the species that depend on them because it kills big sagebrush. Additionally, repeated fires can 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 20 to 30 years; Britton and Clark 1985). Several thousand acres burn on YTC each year. In recent years, burns have occurred in areas with mature sagebrush stands, as troops have trained in more remote areas of the installation and away from established firing ranges. As a result, large tracts of sagebrush habitat have been lost due to fire, reducing the amount of sagebrush habitat. This loss of habitat, especially if it increases with higher levels of training proposed under Alternative 2, could have a significant impact on sagebrush obligate species. Sage-grouse are especially susceptible to loss of habitat due to their dependence on sagebrush and their low population numbers on the installation. With the loss and fragmentation of shrub-steppe habitat, fire poses a significant threat to much of the remaining greater sage-grouse habitat in Washington. Fires caused by live-fire training could remove large areas of suitable sage-grouse habitats, resulting in a significant adverse effect to the species.

6.3.3.4.2.2 Less than Significant Effects

Gunnery activities would produce short, loud blasts that could startle nearby wildlife, temporarily interfering with their activities. Because some wildlife on the installation have habituated to occasional loud noises at impact areas, an increase in the frequency of these loud noises would not be expected to have significant effects on wildlife populations. Species that currently avoid the installation because of the existing levels of noise would continue to do so.

6.3.3.4.3 *Maneuver Training Direct and Indirect Effects*

6.3.3.4.3.1 Significant Effects

The types of impacts to wildlife and their habitats described for Alternative 1 would be similar to those occurring under Alternative 2. However, the number of individuals and acres affected would likely increase in proportion to the level of training activity. Given the increase in off-road vehicle travel to 540,000 miles, it is expected that impacts to wildlife and their habitats would be substantially greater than under Alternative 1. Approximately 36,000 to 54,000 acres (14,569 to 21,853 ha) of wildlife habitat could be affected annually, although some of this acreage would be areas where training by SBCTs and GTA units overlaps. As discussed under Vegetation, if new units conduct their training in a few small, heavily used areas rather than over a large portion of the installation, adverse effects to the highest quality sagebrush habitat would be minimized, and effects to wildlife would be less than significant. However, since there are no regulations or restrictions in place to limit training to heavily used areas, it is assumed that all available training lands could be used for maneuver training if needed. Under such a scenario, the impacts of military training on wildlife and their habitats would be significant.

As discussed in **Section 6.3.1.4.3.1**, SBCT training levels proposed under Alternative 2 could have a significant impact on shrub-steppe vegetation. Therefore, this level of training also could have a significant effect on the wildlife that depend upon this vegetation for all or part of their life requisites. Specifically, damage to vegetation would impact vegetative structure and the availability of perching, nesting, hiding, and foraging sites for wildlife. The recovery afforded training lands would be unlikely to allow for complete recovery of shrub-steppe vegetation, and it is likely that a substantial, long-term reduction in habitat of sagebrush obligate species would occur. A study of Stryker vehicle effects to vegetation at YTC showed that plant cover and height were negatively

correlated, while the amount of bare ground was positively correlated with Stryker vehicle travel intensity (Jones 2002). For big sagebrush sites, plant cover and height decreased by 50 percent or more after only two vehicle passes over an area. Additionally, it is expected that the prevalence of non-native species would increase in many areas used for maneuver training, thereby reducing the value of the lands as wildlife habitat.

Special Status Wildlife Species. According to a BA prepared in conjunction with this EIS, no federally listed threatened or endangered wildlife are found on YTC (**Appendix F**). However, training activities would adversely affect non-federally listed special status wildlife species on YTC.

Special status species that use shrub-steppe habitats would be most at risk for adverse impacts from higher levels of training. Greater sage-grouse and many species of passerines and upland game birds use shrub-steppe habitat for all or part of their life requisites. Shrub-steppe habitat is also important to raptors and mule deer.

More than one-fourth of avian species of concern in Washington use habitats within the shrub-steppe ecosystem including migratory birds (WDFW 2002). For species that use sagebrush for food or cover, damage to sagebrush plants from vehicle maneuvers would lead to loss of habitat (forage, nesting, and cover), and vehicles could directly harm adults or young on the nest. Special status passerine bird species that could be impacted by the proposed training activities include several shrub-steppe obligates. Proposed training activities could cause the injury and loss of migratory and other birds, but would not result in significant adverse effects on bird populations. Training activities would comply with the USFWS rule (as directed by Section 315 of the National Defense Authorization Act of FY 2003) that authorizes such take, with limitations, that result from military readiness activities of the Armed Forces (USFWS 2007).

Special status raptor species that are likely to be found on YTC include the bald eagle, burrowing owl, ferruginous hawk, and golden eagle. Raptors mostly nest in trees, cliffs, and rock outcrops, but forage in shrub-steppe habitat. Loss of shrub-steppe habitat as a result of higher levels of maneuver training would adversely affect nest, roost, and perch sites in trees and prey species for hawks including rodents and small birds. Burrowing owl nests would also be susceptible to impacts, although all known active burrowing owl nest sites are protected from vehicle maneuvers by Seibert stakes.

The Columbia Basin population of the greater sage-grouse, a candidate for federal listing as threatened, would be particularly at risk for adverse effects from increased maneuver training under Alternative 2. YTC's Western Sage-Grouse Management Plan (June 1998) provides for the protection, restoration/enhancement, and monitoring of known sage-grouse leks and nesting areas (SGPAs). The sage-grouse habitat receives seasonal (from February to June) protection from military activity. During the remainder of the year, breeding and foraging habitat in SGPAs would be protected from bivouacking and digging, and maneuver training would be closely monitored and managed, with training area use rotated to promote habitat recovery following training events. Pyrotechnics (e.g., tracer rounds, flares, smoke pots) are restricted during periods of increased fire danger. A few leks (MPRC, and Range 15) are outside of SGPAs and are not afforded protection during the breeding period. Because most nesting and brood rearing activity occurs within 5 miles of leks, higher levels of vehicle activity near these leks during all seasons would increase potential for habitat loss and mortality or injury of adult sage-grouse or their young. Although observations are scarce, males at the MPRC and Range 15 leks appear to be subject to human disturbance. An increase in human disturbance associated with higher levels of training would make shrub-steppe habitat less suitable for sage-grouse due to loss of vegetation. Thus, it is reasonably foreseeable that increased habitat degradation and disturbance associated with increased maneuver training under

Alternative 2 could have a significant impact on sage-grouse populations given their downward trend in population numbers on YTC.

6.3.3.5 Alternative 3 – GTA Actions + CSS Soldiers

6.3.3.5.1 Construction Direct and Indirect Effects

6.3.3.5.1.1 Less than Significant Effects

Under Alternative 3, impacts to wildlife from construction would be the same as those discussed under Alternative 2. No additional construction projects are proposed under Alternative 3.

6.3.3.5.2 Live-Fire Training Direct and Indirect Effects

6.3.3.5.2.1 Significant Effects

Under Alternative 3, the noise associated with live-fire training would be only slightly greater than under Alternative 2. Noise-related effects would be less than significant.

Since the amount of live-fire training by CSS units would be minimal, the risk of fire would only be slightly greater than under Alternative 2. Therefore, effects to wildlife habitat associated with live-fire training would be similar to those discussed under Alternative 2. The likely loss of sage-grouse habitat on YTC over the long-term, which could be slightly greater than under Alternative 2, would be significant.

6.3.3.5.3 Maneuver Training Direct and Indirect Effects

6.3.3.5.3.1 Significant Effects

Under Alternative 3, annual off-road vehicle mileage would increase to approximately 550,000 miles. A total of approximately 36,670 to 55,000 acres (14,835 to 22,260 ha) of habitat could be affected by maneuver training annually, although some of this acreage would be areas where training by SBCTs, GTA, and CSS units overlaps. Because most training activities by CSS units are concentrated in assembly areas, impacts to intact shrub-steppe habitat from maneuver training would not be much greater than under Alternative 2. As under Alternative 2, maneuver training would potentially have a significant impact on shrub-steppe vegetation and the wildlife that depends upon this vegetation for all or part of their life requisites. It is expected that the prevalence of non-native species would increase in many of the areas in which maneuver training would take place, reducing the value of the lands as wildlife habitat.

Special Status Wildlife Species. According to a BA prepared in conjunction with this EIS, no federally listed threatened or endangered wildlife are found on YTC (**Appendix F**). However, training activities would adversely affect non-listed special status wildlife species on YTC. The types of effects and the species affected would be much the same as those discussed under Alternative 2. It is expected that most populations of sensitive wildlife species would be protected from disturbance during the breeding period by existing regulations. However, sage-grouse at some leks are subject to human disturbance that could interfere with breeding success. Impacts to sage-grouse and other shrub-steppe obligates would potentially be significant as a result of habitat degradation.

6.3.3.6 Alternative 4 – GTA Actions + CSS Soldiers + Medium CAB

6.3.3.6.1 Construction Direct and Indirect Effects

6.3.3.6.1.1 Less than Significant Effects

Under Alternative 4, impacts to wildlife from construction would be the same as those discussed under Alternatives 2 and 3. No additional construction projects are proposed under Alternative 4.

6.3.3.6.2 *Live-Fire Training Direct and Indirect Effects*

6.3.3.6.2.1 Significant Effects

Because some wildlife on the installation have habituated to occasional loud noises at impact areas, an increase in the frequency of loud noises associated with live-fire training would not be expected to have significant effects on wildlife populations.

Under Alternative 4, the potential effects to wildlife and their habitat would be similar to those described under Alternatives 2 and 3, but would be greater in extent because of the greater risk of fire under this alternative. Fires caused by live-fire training could remove large areas of shrub-steppe habitats, resulting in a significant impact to sage-grouse and other sagebrush-dependent species.

6.3.3.6.3 *Maneuver Training Direct and Indirect Effects*

6.3.3.6.3.1 Significant Effects

Helicopter training by the medium CAB could affect wildlife by disturbing wildlife and by collisions with birds. Low-level flights by helicopters would cause additional disturbance to wildlife. The loud noise and wind disturbance associated with helicopters would result in a greater incidence of distractions to wildlife than under the other alternatives, and could cause some animals to flee the area. In most cases, animals would be able to resume normal activities after the disturbance ceased, although some long-term behavioral modification and interference with life requisite activities could occur. The species most susceptible to noise disturbance would be sensitive species, such as the bald eagle, which are discussed below. It is expected that bird-aircraft collisions would be infrequent.

Under Alternative 4, human disturbance and off-road vehicle travel associated with maneuver training would be greater than under the other alternatives. Annual off-road vehicle mileage would increase to approximately 570,000 miles. A total of approximately 38,000 to 57,000 acres (15,380 to 23,065 ha) of wildlife habitat could be affected by maneuver training annually, although some of this acreage would be areas where training by SBCTs, GTA, CSS, and CAB units overlaps. As under Alternatives 2 and 3, long-term degradation of wildlife habitat would potentially constitute a significant adverse effect to wildlife species that depend on shrub-steppe habitat. Additionally, more animals would be hit or crushed by vehicles, although it is expected that associated mortality would occur infrequently.

Special Status Wildlife Species. According to a BA prepared in conjunction with this EIS, no federally listed threatened or endangered wildlife are found on YTC. However, training activities would adversely affect non-listed wildlife species, and potentially to a greater degree than under the other alternatives. The types of effects from ground training, and the species affected, would be much the same as those discussed under Alternatives 2 and 3. Additional impacts to sensitive wildlife species would be associated with helicopter training. Although increased helicopter traffic would cause increased avoidance flights and disruption of feeding to wintering bald eagles, existing buffers and altitude restrictions would prevent significant effects to eagles. Greater sage-grouse would be at an increased risk for disturbance during nesting and brood rearing from disturbance from vehicles and helicopters, and loss of habitat to fire. Regulations that prohibit overflights by aircraft within 0.6 mile (1 km) of leks during the lek protection period (March 1 to May 15), as well as the fire management procedures, would help to reduce impacts to the greater sage-grouse. Protection for other sensitive species on the installation would also continue through existing management programs for species and their habitats (particularly intact shrub-steppe and riparian communities). However, as under the other action alternatives, impacts to sage grouse and other shrub-steppe obligates would potentially be significant under Alternative 4.

Proposed training activities could cause the injury and loss of migratory and other birds, but would not result in significant adverse effects on bird populations. Training activities would comply with the USFWS rule (as directed by Section 315 of the National Defense Authorization Act of FY 2003) that authorizes such take, with limitations, that result from military readiness activities of the Armed Forces (50 CFR Part 21).

6.3.3.7 Cumulative Effects

6.3.3.7.1 Significant Effects

Cumulative effects would be less than significant under Alternative 1, but would be significant under all the other alternatives. Short- and long-term, adverse, cumulative impacts to wildlife would occur as a result of Army actions, as well as actions taking place off the installation. Past and present military training activities have resulted in the mortality and injury of wildlife and loss of habitat. Noise and disturbance associated with military personnel and equipment has caused some wildlife to avoid training areas for varying periods of time. Past disturbances in training lands and the cantonment area have favored the spread of noxious weeds and other invasive species to the detriment of native species. The substantial increases in military training from current levels under this alternative would have a significant impact on wildlife, as discussed above.

Regional population increases would lead to more residential and commercial development and conversion of lands to agriculture, mortality and injury to wildlife, and loss and fragmentation of habitat. With the exception of a few large tracts of land (e.g., Hanford Reservation, Crab Creek Wildlife Area), wildlife habitat in much of the remaining portions of the Interior Columbia River Basin is found in fragmented patches not conducive to the welfare of species that require large tracts of contiguous habitat. Although YTC continues to provide a large expanse of wildlife habitat with an important function in regional wildlife connectivity, regular fires associated with training increases would continue to have the potential to affect wildlife connectivity, particularly as a result of large fires. These effects would be cumulative to other regional causes of habitat fragmentation, such as fires at the Hanford Reservation that eliminated certain components of shrub-steppe communities in many areas. These effects have made the existing intact shrub-steppe on YTC more important on a regional scale.

Loss of habitat due to development, agriculture, recreation (horseback riding and all-terrain vehicle use), and military training has been especially harmful to shrub-steppe species. Populations of species that are endemic to these habitats include greater sage-grouse, several species of passerines, upland game birds, and raptors, and a variety of small mammals (Army 2002b).

For several decades, the Army has undertaken programs to protect and enhance wildlife habitat on the installation to offset impacts and to comply with federal and state laws and programs. Seeps, riparian wetlands, and freshwater spring wetlands have been Seibert-staked, as have areas containing special status plant species. Projects have been implemented or are underway to improve wetland and upland habitats. The Army has identified wildlife and habitats of concern on YTC, and has focused much of its efforts on protecting these species and enhancing habitats. Implementation of best management practices and management programs would help reduce impacts to wildlife.

6.3.3.8 Mitigation

6.3.3.8.1 Ongoing Mitigation

As discussed in **Table 6-33**, the Army currently implements numerous management activities and other resource protection strategies to minimize impacts to wildlife on YTC, including sage-grouse and other sensitive species. These activities would continue to occur, regardless of the EIS

alternative selected. These ongoing activities would help to mitigate for some of the impacts associated with the proposed activities under Alternatives 2, 3, and 4. A list of some of these measures that would help mitigate for impacts to wildlife, including special status species, and wildlife habitat is presented below. Proposed new mitigation is presented in **Section 6.3.3.8.2**.

- Continue to follow resource protection measures required by Fort Lewis Regulation 200-1 during field training (see **Section 6.3.1.8.1** for a complete list).
- Continue to implement management practices in line with goals and objectives identified in the ITAM program. These measures include, but are not limited to: promoting vehicle traffic on established roads and away from maneuver-created trails; maintaining recognized roads; repairing (reseeding) maneuver damaged areas; use of land condition data when planning training that may impact soils or vegetation; and Seibert stake protection of sensitive resources.
- Continue to conduct Sustainable Range Awareness training for all units training at YTC to educate them about the importance of minimizing the damage caused to vegetation by off-road travel.
- Continue to implement the requirements of Fort Lewis Regulation 420-5, such as: limiting certain disturbing activities within the SGPA, lek buffers, and bald eagle use areas, and near nest sites of golden eagles, ferruginous hawks, and burrowing owls.

Additionally, Endangered Species Management Plans for bald eagle and sage-grouse direct management for these species and their habitat, including monitoring programs and habitat restoration programs. The Army is also involved in regional recovery efforts for the species, and has participated in a sage-grouse augmentation project that entailed translocation of female sage-grouse from healthy populations in Nevada in an attempt to increase the genetic diversity of the YTC population.

6.3.3.8.2 Proposed New Mitigation

No mitigation measures would be required to address impacts of Alternative 1 on wildlife resources.

Despite ongoing protection measures, significant impacts that could potentially occur under Alternatives 2, 3, and 4 include: a substantial, long-term (greater than 2 years) reduction in the quantity or quality of habitat critical to the survival of local populations of common wildlife species, and a reduction in the population, habitat, or viability of a federal or state species of concern or sensitive species that would result in a trend toward endangerment or the need for federal listing. Since some potential impacts to wildlife are associated with loss or degradation of native habitats, mitigation for vegetation should also help to mitigate effects to wildlife. The following mitigation is proposed to help reduce impacts to wildlife habitat from fire and maneuver training (**Table 6-34**). Additional explanation of proposed mitigation can be found in the BA (**Appendix F**).

- Implement fire mitigation to reduce fire-related impacts to sage-grouse and their habitat, as listed below (these measures are described in more detail in **Section 6.5.8**).
 - Establish wildland fire containment areas.
 - Establish fire exclusion areas.
 - Develop and maintain pre-incident plans for designated locations or activities.
 - Conduct periodic review and refinement of the Wildland Fire Risk Matrix.
 - Implement temporal constraints and other training restrictions during the high fire danger period (15 May through 30 September).
 - Provide additional Range Inspectors.

- Increase wildland fire staffing.
- Provide wildland fire suppression equipment.
- Continue aerial fire suppression capability.
- Develop additional water resources for fire suppression.
- Conduct firebreak update and maintenance.
- Conduct site restoration for wildland fire impacts (efforts are estimated at 9,500 acres annually over the first 5 years and on 6,300 acres annually thereafter).
- Continue to implement the Training Land Recovery Program.
- Realign sage-grouse habitat and core use area protection boundaries – To mitigate for reductions in available habitat and to protect areas consisting of core areas of sage-grouse use on YTC, realign sage-grouse habitat and core use area protection boundaries in TAs 7, 8, 10, 11, and 16 to incorporate sage-grouse use information not considered in the current management plan, and to manage primary containment areas to early seral conditions within the current SGPA.
- Provide appropriate sage-grouse lek area designation protection – To ensure that leks receive the appropriate protection, provide a process to ensure that newly discovered leks receive designated area protection, and that leks that may have become inactive area managed to the land allocation standards they are contained in. Provide designated area protection to two recently discovered leks in TAs 16 and 8, and manage two inactive leks in TAs 12 and 5, and the active lek in the CIA, to the allocation standards they are contained in (**Figure 6-1**).
- Revise the Sage-Grouse Management Plan – Revise the Sage-Grouse Management Plan to incorporate new information and proposed mitigation measures as part of the YTC INRMP revision.
- Revise flight restrictions related to SGPA and leks – Extend existing flight restrictions to all new proposed Sage Grouse Protection Area and Secondary Sage-Grouse Management habitat areas that contain a primary flight route and/or within 1 kilometer of a lek receiving protection (**Figure 6-1**).
- Increase West Nile virus surveillance and control – To reduce the susceptibility of sage-grouse to West Nile virus, continue the current cooperative surveillance program and increase control efforts at all man-made sources of mosquito breeding habitat to include newly proposed water suppression sources.
- Install forb restoration/greenhouse facilities – To augment sage-grouse habitat restoration efforts, install/use previously acquired greenhouses and procure additional greenhouse/restoration supplies for annual forb growing.
- Implement a genetic augmentation program – To provide for the interchange of genetic material and to actively augment the existing sage-grouse population in a periodic basis, establish an agreement with WDFW to work cooperatively in implementing periodic genetic augmentation, as described in the WDFW Sage-Grouse Recovery Plan.
- Continue partnership with the South Central Washington Shrub-Steppe Collaborative (SCWSSC) – To further the goals/objectives of the partnership, which include conserving shrub-steppe habitat on public and private lands in the four-county Yakima Focal Area containing YTC, conserving sage-grouse, maintaining sustainable rangeland resources, and sustaining military training.
- Establish a Candidate Conservation Agreement with the USFWS – To ensure that YTC sage-grouse management efforts to preclude the species from further listing are acknowledged,

work cooperatively with the USFWS in revising and including the YTC sage-grouse management plan in a Candidate Conservation Agreement with the USFWS.

- Explore ACUB and Candidate Conservation Agreement with Assurances for off-installation mitigation – To provide added assurances and as an incentive to landowners for sage-grouse and shrub-steppe conservation efforts, recommend that the SCWSSC explore the possibility of a Candidate Conservation Agreement for private landowners within the Yakima Focal Area of the SCWSSC. Complete an ACUB feasibility assessment and develop ACUB proposals, where appropriate, to reduce encroachment issues pertaining to YTC.
- Recommend development of a regional habitat restoration/protection strategy – To ensure that the management for sage-grouse and shrub-steppe extends beyond YTC boundaries at scales appropriate for management of sage-grouse and its habitat, explore the possibility of a Regional Restoration Strategy for all federal and state agencies within the Yakima Focal Area of the SCWSSC.
- Develop a sage-grouse predator assessment and management plan – To address the continuing impact of predation on production and survival of sage-grouse populations, assess the predation issues and predator management options, and develop a predator management plan (three-year phased one-time project).
- Fence marking/removal for protection of sage-grouse – Fences have been documented as a source of sage-grouse mortality throughout YTC. To address this source of mortality, fences no longer required will be removed and fences that are required will be marked to increase their visibility to sage-grouse.

6.3.3.9 Other Disclosures

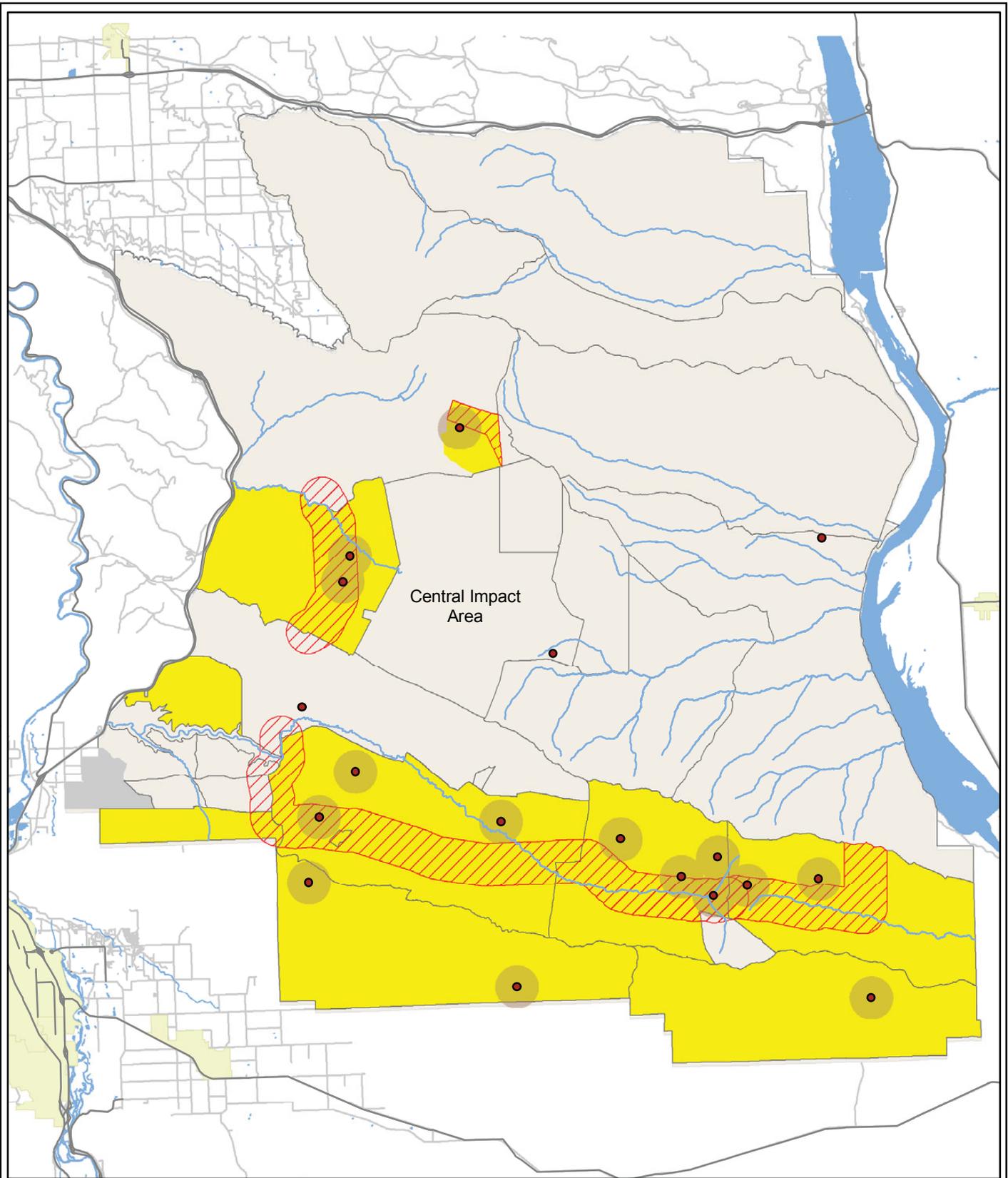
6.3.3.9.1 Migratory Birds

There would be minor impacts to migratory birds from action alternatives. Direct impacts would occur if birds were harmed by Stryker vehicles or munitions during training. Indirect impacts would occur from training-related disturbance and noise and from loss of habitat. Ground- and shrub-nesting birds in shrub-steppe and grassland habitats would be most affected, while impacts to species using wetlands, cliffs, and other inaccessible areas would be minimal. Additional discussion of potential impacts to birds is provided throughout the wildlife analysis in **Section 6.3.3**.

Proposed activities could cause the injury and loss of migratory birds, but would not result in significant adverse effects on bird populations. The proposed activities would comply with the USFWS rule (as directed by Section 315 of the National Defense Authorization Act for FY 2003) that authorizes take of migratory birds, with limitations, that result from military readiness activities of the Armed Forces (50 CFR Part 21). The mitigation measures for vegetation and wildlife presented in **Sections 6.3.1.8** and **6.3.3.8** would help to minimize effects to these species. Because a significant adverse effect on a population of a migratory bird species is not likely under the action alternatives, additional conservation measures to minimize or mitigate adverse effects are not required.

6.3.3.10 Conclusions

Significant impacts to wildlife resources are expected to occur under the action alternatives, especially Alternative 4, as a result of a potentially substantial increase in fire risk and in vehicle and helicopter activity on YTC each year. Training-related impacts would be lowest under Alternative 1 and greatest under Alternative 4.



-  Cantonment Area
-  Expanded Sage-Grouse Protection Area
-  City Boundary
-  Rivers and Streams
-  Expanded Sage-Grouse Seasonal No-Fly Zone
-  Sage-Grouse Leks and Proposed Buffers



FORT LEWIS GTA EIS	
<p><i>Figure 6-1</i> Proposed Sage-Grouse Mitigation</p>	
ANALYSIS AREA: Yakima Training Center	
Date: 5/13/2010	File: Figure_6-1_New_sage-grouse.mxd
Prepared By: KA	Layout: Figure_6-1_New_sage-grouse.pdf

6.4 WETLANDS

Construction- and training-related ground-disturbing activities can adversely affect wetlands in several ways. They can directly affect wetlands through direct disturbance. Indirectly, they can cause sedimentation of wetlands by disturbing soils and exposing them to wind and water, reduced infiltration, and increased runoff. Impacts to wetlands were assessed by evaluating the potential effects of project construction and operations activities on wetlands directly. The evaluation also considered the indirect effects of project activities on soils and water resources.

6.4.1 Resource-specific Significance Criteria

The significance of wetlands effects was determined using the following considerations:

- Compliance with policies and regulations related to wetlands conservation and protection, including the CWA, EO 11990, Protection of Wetlands, and Army Regulation 200–1.
- Percentage losses in size and functions of local and regional wetland resources.

6.4.2 Overview of Impacts to Wetlands by Alternative

Table 6-11 summarizes the impacts on wetlands that would occur under each of the alternatives.

Table 6-11 Summary of Potential Impacts to Wetlands at YTC

Activity Group	Alt 1	Alt 2	Alt 3	Alt 4
Construction Direct and Indirect Effects	•	•	•	•
Live-fire Training Direct and Indirect Effects	€	€	€	€
Maneuver Training Direct and Indirect Effects	€	€	€	€
Cumulative Effects	€	€	€	€

U = Significant Effects
 W = Significant but Mitigable to less than Significant Effects
 € = Less than Significant Effects
 + = Beneficial Effect
 N/A = Not Applicable
 • = No Effects

6.4.3 Alternative 1 — No Action Alternative

6.4.3.1 Construction Direct and Indirect Effects

6.4.3.1.1 No Effects

No projects would be constructed at YTC under this alternative. Consequently, no wetlands at YTC would be disturbed by construction.

6.4.3.2 Live-fire Training Direct and Indirect Effects

6.4.3.2.1 Less than Significant Effects

Implementation of this alternative would continue the less than significant live-fire training impacts that currently affect wetlands on YTC. Training on the live-fire ranges would not disturb wetlands directly since wetlands are off-limits.

Indirectly, fugitive dust generated by training could drift from the ranges and be deposited in downwind wetlands. However, this impact would be less than significant because the dust would be limited by natural moisture and standard dust suppression measures, and periodic precipitation at

YTC would flush out any fugitive dust deposited in them. No such wetland dust deposition problems have been reported at YTC to date.

Another continued indirect effect would be potential for a wildfire to burn a wetland. The potential for accidental wildfire ignition under Alternative 1 would remain the same as it is currently and the effects of wildfires burning wetlands are expected to be less than significant. Wetlands present on YTC are primarily occupied by cattails, rushes, and sedges, which recover rapidly after burning.

6.4.3.3 *Maneuver Training Direct and Indirect Effects*

6.4.3.3.1 *Less than Significant Effects*

The amount of training conducted annually would not increase under this alternative. Therefore, sedimentation into water bodies on YTC associated with off-road vehicle travel would be much the same as over recent years.

With maneuver training, vehicles would be crossing streams at vehicle stream crossings. On YTC, vehicles only cross waterways at designated crossings. At unhardened crossing locations, some discharge of suspended sediments from the stream bank and bed into the water and downstream wetlands would likely occur. At hardened crossings, vehicles would carry some soil from upland areas into streams, temporarily affecting the water quality and potentially depositing the sediment in wetlands downstream. Vehicles crossing streams at locations with culverts would not discharge sediment into the streams. Overall, any impacts to water quality in wetlands from vehicles fording creeks would be localized, less than significant, and temporary.

Digging activities could result in some increased sedimentation, as the associated loss of plant cover could expose soil to wind and water, reduce infiltration, and increase runoff. Given that the amount of land exposed to digging at any given time is very small, and that areas that support multiple excavations are reseeded once training is complete, the amount of sedimentation into waterways as a direct or indirect result of digging would have less than significant, long-term effects on wetlands.

The risk for leaks and spills during fueling or training would remain the same as existing conditions under Alternative 1. The Training Unit SOP prohibits POL vehicles from parking closer than 100 meters from drainages, and requires that refueling points be located at least 200 meters from drainages. In addition, because vehicles would only cross streams at designated crossings and YTC would require that all spills be cleaned up, the risk of contamination of water resources as a result of training would continue to be low.

6.4.4 Alternative 2 — GTA Actions

6.4.4.1 *Construction Direct and Indirect Effects*

6.4.4.1.1 *No Effects*

Construction of the SFF Range and MPMG Range at Range 5 would not affect any wetlands because the construction footprint for both ranges is located outside of wetland areas. Therefore, no wetlands would be disturbed.

6.4.4.2 *Live-fire Training Direct and Indirect Effects*

6.4.4.2.1 *Less than Significant Effects*

The effects of live-fire training on wetlands would be similar to those for Alternative 1. No direct effects are anticipated; however, indirect effects would be greater due to increased live-fire training

under Alternative 2. The potential for accidental wildfire ignition would increase because of the increased frequency in the use of explosives and munitions, as well as the presence of additional vehicles, and flammable materials in training areas. Although the risk of wetlands burning because of wildfire would increase under Alternative 2, the effects of wildfires burning wetlands are expected to be less than significant since wetlands present on YTC are primarily occupied by cattails, rushes, and sedges, which recover rapidly after burning.

6.4.4.3 *Maneuver Training Direct and Indirect Effects*

6.4.4.3.1 *Less than Significant Effects*

The types of impacts on wetlands from maneuver training under Alternative 2 would be the same as those discussed under Alternative 1. However, the potential for sedimentation into water bodies on YTC associated with off-road vehicle travel and digging activities would increase due to the increase in annual maneuver training under Alternative 2. In addition, with the increase in training, there would likely be an increase in the number of vehicle stream crossings occurring on YTC. As discussed under Alternative 1, on YTC, vehicles only cross waterways at designated crossings. Overall, with the implementation of the management practices described under Alternative 1, any impacts to water quality in wetlands from maneuver training would be localized, less than significant, and temporary.

Because there would be an increase in the number of vehicles, munitions, and other equipment used during maneuver training under this alternative, there would also be a greater risk for leaks and spills to occur during fueling or training. However, with the implementation of the Training Unit SOP and BMPs, the risk of contamination of water resources because of increased training would be low.

6.4.5 Alternative 3 — GTA Actions + CSS Soldiers

6.4.5.1 *Construction Direct and Indirect Effects*

6.4.5.1.1 *No Effects*

No additional construction projects are proposed under Alternative 3. Therefore, construction-related wetland impacts would be the same as those discussed under Alternative 2.

6.4.5.2 *Live-fire Training Direct and Indirect Effects*

6.4.5.2.1 *Less than Significant Effects*

Live-fire training impacts on wetlands would be similar to those described under Alternative 2. While these impacts would be slightly greater under Alternative 3, they would remain less than significant. While the potential for accidental wildfire ignition would increase because of the increased frequency in the use of explosives and munitions, vehicles, and flammable materials in training areas, the effects of wildfires burning wetlands are also expected to be less than significant. Wetlands present on YTC are primarily occupied by cattails, rushes, and sedges, which recover rapidly after burning.

6.4.5.3 *Maneuver Training Direct and Indirect Effects*

6.4.5.3.1 *Less than Significant Effects*

Maneuver training effects on wetlands under Alternative 3 would be similar to those described under Alternative 2, but would be slightly greater due to an increase in maneuver training activities associated with CSS Soldiers. Since the amount of training conducted annually would increase from Alternatives 1 and 2, the potential for sedimentation into water bodies on YTC associated with off-

road vehicle travel and digging activities, as well as the potential for contamination due to a spill or leak, would also increase. However, these effects would remain less than significant.

6.4.6 Alternative 4 — GTA Actions + CSS Soldiers + Medium CAB

6.4.6.1 Construction Direct and Indirect Effects

6.4.6.1.1 No Effects

No additional construction projects are proposed under Alternative 4. Therefore, construction-related wetland impacts would be the same as those discussed under Alternative 2.

6.4.6.2 Live-fire Training Direct and Indirect Effects

6.4.6.2.1 Less than Significant Effects

Live-fire training impacts on wetlands would be similar to those described under Alternative 2. While these impacts would be greater under Alternative 4, they would remain less than significant. Although training would increase under Alternative 4, training on the live-fire ranges is unlikely to disturb wetlands directly because wetlands are off limits. In addition, although the potential for accidental wildfire ignition would increase due to increased training, the effects of any increased number of wildfires burning wetlands are expected to be less than significant. Wetlands present on YTC are primarily occupied by cattails, rushes, and sedges, which recover rapidly after burning.

6.4.6.3 Maneuver Training Direct and Indirect Effects

6.4.6.3.1 Less than Significant Effects

Maneuver training effects on wetlands under Alternative 4 would be similar to those described under Alternative 2. Since the amount of training conducted annually would increase from Alternatives 1, 2, and 3, the potential for sedimentation into water bodies on YTC associated with off-road vehicle travel and digging activities, as well as the potential for contamination due to a leak or spill, would also increase. However, this increase would be minor since many medium CAB maneuver training activities would be conducted aurally. Implementation of measures, such as designated vehicle stream crossings, avoidance of wetland areas, and the Training Unit SOP, would keep wetland impacts to less than significant.

6.4.7 Cumulative Effects

6.4.7.1 Less than Significant Effects

Cumulative effects would be less than significant under all of the alternatives. As discussed above, direct and indirect effects to wetlands generated by the alternatives themselves would be less than significant. These impacts could overlap the effects of one or more of the reasonably foreseeable future actions, such as ongoing training by visiting units and HIMARS training. Despite legal measures, wetlands are still disappearing regionally; however, wetland areas at YTC have not diminished, and conditions overall have been improved for a number of years. Implementation of BMPs and mitigation measures identified for these other actions would limit the cumulative effects to less than significant.

6.4.8 Mitigation

Currently, YTC implements a variety of BMPs to mitigate or reduce the effects of the Army's activities on wetlands. These BMPs include excluding some activities and limiting other activities in

the vicinity of wetlands; implementing various plans, such as EPPs; and continuing watershed protection programs (**Table 6-33**). The analysis of the direct, indirect, and cumulative effects for the four alternatives concludes that the effects on wetlands are less than significant. Therefore, no new or additional mitigation is necessary to avoid, limit, repair, reduce, or compensate for the adverse effects.

6.5 WILDFIRE MANAGEMENT

Many ecosystems require fire for function and productivity, and fire is not always considered an adverse impact. However, wildfires are a concern on YTC because of the potential impact on human activities and structures, sensitive biological and cultural resources, air quality, and military operations. Alteration of the natural fire regime by increasing the rate of ignitions is a potential adverse impact. This is especially important in the shrub-steppe ecosystems, like those present at YTC, where increased fire frequency has led to major shifts in plant communities. The result has been a decrease in size and density of late seral stage native vegetation communities, and an increase in fire-susceptible communities. This has also impacted soil retention, water quality, wildlife, and habitat. In addition, large-scale fire is one of the most significant threats to the federal candidate species greater sage-grouse, which occurs at YTC. This species requires mid- to late-successional sagebrush habitat, and natural re-establishment of sagebrush is slow, taking up to 20 to 30 years.

Each alternative was evaluated for its potential to impact wildfire risk adversely and its affect on wildfire management. Impacts from cantonment and range construction and live-fire and maneuver training were evaluated for their potential to affect wildfire risk adversely. Construction of facilities and the facilities themselves are not considered to impact wildfire risk adversely. Live-fire and maneuver training were identified as the primary activities capable of increasing the rate of fire to above natural frequencies. Fire-related practices and policies that were in place through 2009 at YTC applicable to each alternative are presented in **Chapter 5**, and were evaluated on their ability to address appropriate changes to wildfire risk or management associated with implementing the stationing and realignment decisions of the 2007 GTA PEIS, as well as the future stationing of CSS Soldiers and a medium CAB, at YTC. Because wildland fire impacts have increased in the past 5 years as a result of several factors, including weather conditions, natural causes (e.g., lightning), and ineffective wildland fire management practices, and wildland fire impacts have occurred in areas outside established ranges and impact/dud areas, YTC staff conducted a review of current wildland fire management practices in the winter of 2009/2010. As a result of this review, changes were identified to the policies and practices described in **Chapter 5** to address the overall effectiveness of wildland fire management practices at YTC. These changes are included in the BMPs listed in **Table 6-33** and Mitigation requirements listed in **Table 6-34**, and are discussed as appropriate throughout the following sections. These changes included revised firebreak coverages and the establishment of primary and secondary containment areas, all of which are subject to future reviews, revisions, and updates as conditions warrant.

The following issue relating to wildfire management at YTC was identified during public scoping. This issue is addressed in the following sections for each alternative.

- The potential for increased fire danger resulting from increased live-fire training use of YTC.

6.5.1 Resource-specific Significance Criteria

Impact determinations were based on the assumption that the existing wildfire condition serves as a baseline. YTC is in the situation where wildfire management impacts are already significant and any increase would remain significant.

6.5.2 Overview of Impacts to Fire Management by Alternative

Table 6-12 summarizes the impacts on fire management that would occur under each of the alternatives.

Table 6-12 Summary of Potential Impacts to Wildfire Management at YTC

Activity Group	Alt 1	Alt 2	Alt 3	Alt 4
Construction Direct and Indirect Effects	N/A	•	•	•
Live-fire Training Direct and Indirect Effects	U	U	U	U
Maneuver Training Direct and Indirect Effects	U	U	U	U
Cumulative Effects	U	U	U	U

U = Significant Effects

W = Significant but Mitigable to less than Significant Effects

€ = Less than Significant Effects

+ = Beneficial Effect

N/A = Not Applicable

• = No Effects

6.5.3 Alternative 1 — No Action Alternative

6.5.3.1 Construction Direct and Indirect Effects

6.5.3.1.1 Not Applicable

No cantonment area or training range construction is anticipated at YTC under Alternative 1; therefore, impact analysis is Not Applicable. There would be no increased risk of wildfire, and no impacts to wildfire management are anticipated.

6.5.3.2 Live-fire Training Direct and Indirect Effects

6.5.3.2.1 Significant Effects

Under Alternative 1, live-fire training would continue occur on YTC at current frequencies and intensities, and ignitions and fires would continue to occur at current frequencies on YTC as a result of these live-fire activities. Such fires would be concentrated at locations such as existing ranges, the CIA, and MPRC. Although the risk of wildfire would depend on other factors, such as weather conditions and fuel loads, the risk of accidental wildfire ignition is not anticipated to increase under Alternative 1 because the frequency, type, and intensity of training activities would not change over current conditions. No additional impacts on firefighting resources or wildfire management are anticipated. Under YTC's current wildland fire management program, several measures to minimize wildfire risk and suppress fires are already in place including implementing a Fire Risk Management Assessment prior to training activities during the fire danger season, pre-incident planning, fire suppression activities by troops and the YTC Fire Department, prescribed burning, and maintenance of firebreaks. However, this existing program is insufficient to manage existing wildfire risk at YTC.

Because wildland fire impacts have increased in the past 5 years as a result of several factors, including weather conditions, natural causes (e.g., lightning), and ineffective wildland fire management practices, YTC staff conducted a review of current wildland fire management practices in the winter of 2009/2010. This analysis found that increased wildland fire impacts have occurred in areas outside established ranges and impact/dud areas, resulting in impacts to areas where fires are not expected to occur. The analysis found that additional BMPs and Mitigation related to Wildland Fire Management (presented in Table 6-33 and Table 6-34, and discussed in Section 6.5.8) are needed to contain fires within designated containment areas, including additional staff, equipment, and aerial fire suppression water resources to support training needs. Therefore, wildfire impacts under Alternative 1 are anticipated to remain significant. Implementation of the mitigation measures

outlined in **Section 6.5.8** would reduce these impacts to a less than significant level for most fires that may occur from continued current training activities under Alternative 1. However, there is still a potential that a large-scale fire could occur and result in significant impacts.

6.5.3.3 *Maneuver Training Direct and Indirect Effects*

6.5.3.3.1 *Significant Effects*

Transportation of personnel and equipment, off-road use of vehicles, use of pyrotechnics and tracer ammunition, demolition activities, and use of flammable or combustible materials, such as fuel or ordnance, would continue to pose a wildfire risk. Fires from maneuver training activities would continue to occur at current frequencies at YTC. The inherent risk of accidental ignition attributed to maneuver training is minor. Although the risk of wildfire would depend on other factors, such as weather conditions and fuel loads, the risk of accidental wildfire ignition is not anticipated to increase under Alternative 1 because the frequency, type, and intensity of maneuver training activities would not change over current conditions. No additional impacts to wildfire management or firefighting resources are anticipated; however, overall impacts to wildfire management from current training levels would continue to be significant because the existing fire management program at YTC is not sufficient to manage existing wildfire risk at YTC. The conclusion that wildland fire conditions have changed and are significant resulted from a winter 2009/2010 analysis of wildland fire impacts by YTC staff. This analysis found that wildland fire impacts have increased outside of established ranges and impact/dud areas over the past 5 years, resulting in impacts to areas where fires are not expected to occur. The analysis found that additional BMPs and Mitigation (presented in **Tables 6-33** and **6-34**, and outlined in **Section 6.5.8**) related to Wildland Fire Management are needed to contain fires within designated containment areas. Implementation of the mitigation measures outlined in **Section 6.5.8** would reduce these impacts to a less than significant level for most fires that may occur from continued maneuver training activities under Alternative 1. However, there is still a potential that a large-scale fire could occur and result in significant impacts.

6.5.4 Alternative 2 — GTA Actions

6.5.4.1 *Construction Direct and Indirect Effects*

6.5.4.1.1 *No Effects*

Additional training range construction would be necessary under Alternative 2. While training range construction activities would temporarily increase human presence, equipment use, and activity at construction sites, this increase is not expected to impact the risk of accidental wildfire ignition. The small potential for accidental ignition during construction activities would be short-term and negligible. No impacts to wildfire management are anticipated from training range construction. The new ranges would be required to have necessary wildland fire management features (e.g., containment areas, firebreaks, pre-incident plans) as part of their construction and operation and maintenance phases.

No cantonment area construction is anticipated to occur at YTC under Alternative 2; therefore, impact analysis is Not Applicable. There would be no increased risk of wildfire ignition, and no impacts to wildfire management are anticipated.

6.5.4.2 *Live-fire Training Direct and Indirect Effects*

6.5.4.2.1 *Significant Effects*

Live-fire training under Alternative 2 would be focused on existing ranges and the two new ranges, and where possible, some weapons systems would use inert training rounds, which have less

environmental impact, as a substitute for the firing of live rounds. However, the approximate 50 percent increase in the frequency of use of mutations, as well as increased vehicles, flammable materials, and pyrotechnics (e.g., flares, smoke devices), is anticipated to result in about a 50 percent increase in the rate of ignitions in training and impact areas. Analysis has found that most fires (over 90 percent) start and are contained within established range areas. Analysis has also found that ensuring that fires are effectively contained within designated containment areas for this alternative would require the implementation of the mitigation measures described in **Section 6.5.8** and **Table 6-34**, and the BMPs presented in **Table 6-33**. Although the risk of wildfire occurring from ignitions would depend on other factors, such as weather conditions, location of ignition, and fuel loads, the risk of accidental wildfire ignition would significantly increase under Alternative 2. The vegetation communities present at YTC consist of light fuels that are easily ignited and burn rapidly, resulting in fires that spread quickly. A wildfire can damage animal and plant communities, including listed species, damage cultural resources and places of traditional importance, increase soil erosion from vegetation removal, and contribute to the spread of invasive plant species. Fires that move off post have the potential to damage surrounding homes and community resources.

Fires would continue to be concentrated at locations such as the CIA and MPRC at YTC under Alternative 2, with some fires also occurring in training areas. Although the cumulative average acreage burned at YTC as a result of training activities has declined over the past decade due to enhancements in fire management policy related to pre-suppression and suppression activities and improved suppression resources and personnel training, large-scale fires, such as the large fire that occurred in 2003, still occur at YTC and can escape off post. Based on YTC's fire history, climate, and the types of vegetation communities present at the installation, the increase in wildfire risk ignitions associated with the 50 percent increase in live-fire training under Alternative 2 is anticipated to be significant.

Several measures to minimize wildfire risk and suppress fires are in place under YTC's Integrated Wildland Fire Management Program, which would reduce the risk of wildfires occurring as a result of training activities under Alternative 2 and would decrease the extent and intensity of fires that do occur. Pre-suppression actions include the planning and execution of pre-emptive measures, such as construction and maintenance of firebreaks, development of suppression water resources, prescribed burning, pre-incident planning, and implementation of a system of risk management that considers daily fire danger and proposed activities. Suppression measures include providing for adequate ground and aerial assets (e.g., seasonal wildland firefighters and firebucket assets during the fire danger season) necessary to rapidly suppress and control fires to contain them on YTC, preventing fires from escaping from designated control areas (e.g., impact areas, range fans), and preventing impacts to sensitive resources (e.g., riparian/wetland areas, sensitive species habitats). Specific methods for accomplishing these measures are addressed in the IWFMP and CNRMP/INRMP. While these measures would decrease the probability of a fire occurring from training activities and reduce the extent and intensity of fires that do occur, the existing fire management program is not sufficient to manage current or projected increases in training-related fires. Therefore, wildfire impacts under Alternative 2 are anticipated to be significant. Implementation of the mitigation measures outlined in **Section 6.5.8** would reduce these impacts to a less than significant level for most fires that may occur from increased training activities under Alternative 2. However, there is still a potential that a large-scale fire could occur and result in significant impacts.

6.5.4.3 *Maneuver Training Direct and Indirect Effects*

6.5.4.3.1 *Significant Effects*

Transportation of personnel and equipment, off-road use of vehicles, use of pyrotechnics and tracer ammunition, demolition activities, and use of flammable or combustible materials, such as fuel or

ordnance, would increase with the approximately 50 percent increase in the amount of maneuver training under Alternative 2, all of which would increase the potential for an accidental ignition. Although the risk of wildfire occurring from ignitions would depend on other factors, such as weather conditions, location of ignition, and fuel loads, the risk of accidental wildfire ignition would increase under Alternative 2.

Maneuver training under Alternative 2 would occur in areas that are currently used for off-road maneuvers at YTC, and would occur over a wide range of terrain. The inherent risk of accidental ignition attributed to maneuver training is minor. However, increased training use and frequency under Alternative 2 may result in training extending into areas that have not been used as frequently. Based on YTC's fire history, climate, and the types of vegetation communities present at the installation, the corresponding increase in ignition risk associated with the 50 percent increase in maneuver training under Alternative 2 is anticipated to be significant. Increased maneuver training would also increase the potential for damage to firebreaks from vehicles at YTC. Heavy damage from training during winter months was noted to be the probable cause of vegetation overgrowth along several existing firebreaks in recent years (Durkee 2006, Roberts and Durkee 2005). While continued implementation of YTC's wildland fire management program (described under Live-Fire Training above) would decrease the probability of a fire occurring from maneuver training activities and reduce the extent and intensity of fires that do occur, the existing fire management program is not sufficient to manage current or projected increases in training-related fires. Therefore, wildfire impacts from increased maneuver training under Alternative 2 are anticipated to be significant. Implementation of the mitigation measures outlined in **Section 6.5.8** would reduce this impact to a less than significant level for most fires that may occur from increased training activities under Alternative 2. However, there is still a potential that a large-scale fire could occur and result in significant impacts.

6.5.5 Alternative 3 — GTA Actions + CSS Soldiers

6.5.5.1 Construction Direct and Indirect Effects

6.5.5.1.1 No Effects

No additional cantonment area or training range construction would occur at YTC to support CSS Soldiers; therefore, effects on wildfire management would be the same as for Alternative 2.

6.5.5.2 Live-fire Training Direct and Indirect Effects

6.5.5.2.1 Significant Effects

The additional training of CSS Soldiers would further increase the amount of live-fire training and rounds fired occurring at YTC over that occurring under Alternative 2; however, the increase above Alternative 2 would be minor. Therefore, the increase in ignitions above Alternative 2 would be minor. Although the risk of wildfire occurring from ignitions would depend on other factors, such as weather conditions, location of ignition, and fuel loads, the risk of accidental wildfire ignition would slightly increase under Alternative 3 and would be significant. Implementation of the mitigation measures outlined in **Section 6.5.8** would reduce this impact to a less than significant level for most fires that may occur from increased training activities under Alternative 3. However, there is still a potential that a large-scale fire could occur and result in significant impacts.

6.5.5.3 Maneuver Training Direct and Indirect Effects

6.5.5.3.1 Significant Effects

The additional training of CSS Soldiers would further increase the amount of maneuver training occurring at YTC under Alternative 3 over that occurring under Alternative 2; however, the increase

above Alternative 2 would be minor. There would be a corresponding increase in ignitions due to increased transportation of personnel and equipment, off-road vehicle use, use of pyrotechnics and tracer ammunition, demolition activities, and use of flammable or combustible materials, such as fuel or ordnance. Increased maneuver training would also increase the potential for damage of firebreaks from vehicles at YTC. The existing fire management program is not sufficient to manage the increase in fires that are anticipated to occur under Alternative 3. Implementation of the mitigation measures outlined in **Section 6.5.8** would reduce impacts to a less than significant level for most fires that may occur from increased training activities under Alternative 3. However, there is still a potential that a large-scale fire could occur and result in significant impacts.

6.5.6 Alternative 4 — GTA Actions + CSS Soldiers + Medium CAB

6.5.6.1 Construction Direct and Indirect Effects

6.5.6.1.1 No Effects

No additional cantonment area or training range construction is anticipated at YTC to support the medium CAB; therefore, effects on wildfire management would be the same as described for Alternative 2.

6.5.6.2 Live-fire Training Direct and Indirect Effects

6.5.6.2.1 Significant Effects

The additional training of a medium CAB would further increase the amount of live-fire training and rounds fired occurring at YTC under Alternative 4 over that occurring under Alternative 3. This increase would be moderate in intensity. In addition to individual weapons practice and qualification, aviation units conduct aviation gunnery tasks, such as door gunner qualification, diving fire engagements, and aviation armor engagements. A proportionate increase in ignitions would result from the increased frequency and intensity of live-fire training including frequent gunnery training from helicopters. In addition, with an increased number of aircraft training on YTC under Alternative 4, the risk of fires related to aircraft accidents would be greater. Although the risk of wildfire occurring from ignitions would depend on other factors, such as weather conditions, location of ignition, and fuel loads, the risk of accidental wildfire ignition would increase under Alternative 4 above that anticipated under the other alternatives. The vegetation communities present at YTC consist of light fuels that are easily ignited and burn rapidly, resulting in fires that spread quickly.

Based on YTC's fire history, climate, and the types of vegetation communities present at the installation, the increase in wildfire ignitions associated with the increase in live-fire training, including aviation gunnery training, under Alternative 4 is anticipated to be significant. The potential for an increase in accidental wildfire ignition due to live-fire training would be greatest under Alternative 4 compared with the other alternatives, particularly during the high fire danger period. Continued implementation of YTC's wildland fire management program would reduce the probability of wildfire occurrence from training and would decrease the extent and intensity of fires that do occur. While these measures would decrease the potential for wildland fire impacts, the existing fire management program is not sufficient to manage current or projected increases in training-related fires. Therefore, wildfire impacts under Alternative 2 are anticipated to be significant. Implementation of the mitigation measures outlined in **Section 6.5.8** would reduce these impacts to less than significant for most fires that may occur from increased training activities under Alternative 4. However, there is still a potential that a large-scale fire could occur and result in significant impacts.

6.5.6.3 Maneuver Training Direct and Indirect Effects

6.5.6.3.1 Significant Effects

Flight and joint military training with the medium CAB would occur throughout YTC, but most often at established ranges and the CIA at YTC. Aviation maneuver training would also involve the firing of munitions; the effects of medium CAB-related munitions on fire risk and management at YTC are described above under Live-fire Training. The primary additional wildfire concern from medium CAB maneuver training would be an increased potential for fires related to aircraft accidents and from ignitions at landing sites. The inherent risk of accidental ignition attributed to maneuver training is minor. However, increased training use and frequency under Alternative 4 may result in training extending into areas that have not been used as frequently. While continued implementation of YTC's wildland fire management program would decrease the probability of a fire occurring from maneuver training activities and reduce the extent and intensity of fires that do occur, the existing fire management program is not sufficient to manage current or projected increases in training-related fires. Therefore, wildfire impacts from increased maneuver training under Alternative 4 are anticipated to be significant. Implementation of the mitigation measures outlined in **Section 6.5.8** would reduce these impacts to a less than significant level for most fires that may occur from increased training activities under Alternative 4. However, there is still a potential that a large-scale fire could occur and result in significant impacts.

6.5.7 Cumulative Effects

6.5.7.1 Significant Effects

There would be some adverse additive wildfire impacts expected from other Army proposals and projects occurring or anticipated to occur at YTC. Other actions that would increase the potential for a fire on YTC include ongoing live-fire and maneuver training activities, including HIMARS training and training by visiting units. Fire risk associated with HIMARS training is primarily limited to ignition of the HIMARS rocket, as the rockets are non-explosive on impact, resulting in localized increases in wildfire risk at and around the ignition site. Training by other visiting units would increase the use of explosives and munitions, thereby increasing the potential for ignitions and resulting fires. Other Army projects occurring or that may occur in the reasonably foreseeable future are expected to contain mitigation measures to minimize the potential for starting a wildfire and to reduce environmental impacts associated with wildfires. In addition, the Army has developed an IWFMP to prevent and control fires at YTC, and the plan is reviewed annually.

Live-fire and maneuver training continued at current levels under Alternative 1 and increased live-fire and maneuver training (and the associated increases in ignitions) under Alternatives 2, 3, and 4, would contribute to significant cumulative wildfire impacts on YTC. High fire-risk areas, such as the CIA and MPRC, would continue to be treated with prescribed burning and firebreak and road maintenance to reduce the spread of fire, and training would continue to follow established protocols for wildland fire management. However, the existing fire management program at YTC is not sufficient to manage current or projected increases in training-related fires. Implementation of the mitigation measures outlined in **Section 6.5.8** would improve efficiencies in wildfire management at YTC. While these measures would reduce wildfire impacts to a less than significant level for most fires that may occur from training and other activities at YTC, there is still a potential that a large-scale fire could occur and result in significant impacts.

6.5.8 Mitigation

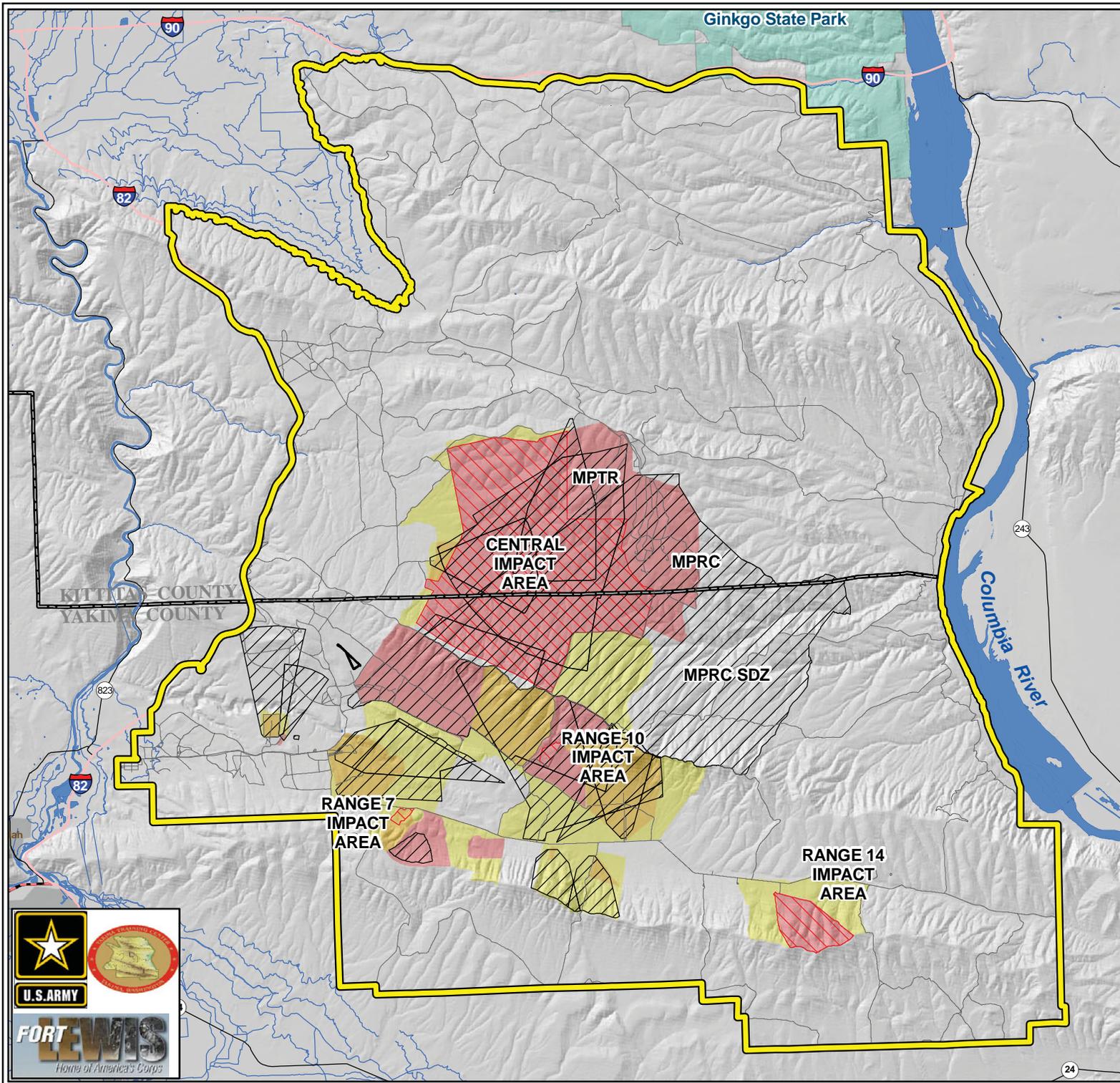
YTC has identified BMPs and mitigation measures to help reduce the risk of fire on YTC. The BMPs would be implemented regardless of whether or not the proposed action occurs, in an acknowledgement that existing fire management may be inadequate to manage current wildfire risk at YTC. The BMPs are listed in detail in **Table 6-33**, and briefly include:

- Complete a comprehensive update of the IWFMP.
- Recently, policy and technical committees, including a Fire Technical Team, Fire Restoration Team, and a Fire Policy Team, were established to oversee, update, and implement the IWFMP.
- Increase fire awareness training for Training Units.
- Maximize Fire Department Personnel down range.
- Evaluate mutual aid practices and make adjustments to ensure that adequate coverage is available at YTC during training activities.
- Increase accountability via a post-fire review process to determine whether negligence on the part of training units has caused fires that have impacted resources and require restoration. In certain cases, the training unit causing the fire may be required to pay for repairs and restoration resulting from negligence.

In addition to BMPs, the Army would implement the mitigation measures listed in **Table 6-34** to further minimize the risks of wildland fire and reduce wildfire-related impacts at YTC under Alternatives 1, 2, 3, and 4. These measures are briefly presented listed below, along with an explanation of each measure.

- Develop and maintain pre-incident plans – Although pre-incident plans are a part of the current fire management program at YTC, they are only done for the MPRC and CIA. Under this mitigation, the pre-incident planning program would be expanded to include all established ranges, the convoy live-fire route, and activities occurring outside of established containment areas.
- Conduct periodic review and refinement of the Wildland Fire Risk Matrix – Although a Wildland Fire Risk Matrix is currently used to assess fire danger risks, the matrix is being refined by changing the wind thresholds, simplifying the scoring, adding timing considerations, and adding spatial adjustments. Additionally, the revised matrix results in an automatic “no-firing” decision if the fire danger rating is Extreme (approximately 3 percent of the time), which does not occur at present.
- Establish wildland fire containment areas – The primary and secondary containment areas identified to date are shown in **Figure 6-2**. These containment areas were identified based on review of historic wildland fire data and current and future land use (e.g., tracer burn-out distance). Their designation results form a recognition by the Army that training activities result in unavoidable fire impacts, which are most likely to occur at certain locations (e.g., established ranges and impact/dud areas). The Army also recognizes that to successfully contain fires, other land use objectives will not be attainable within containment areas. Primary containment areas will be managed to an early successional stage to reduce the amount of fuels that are present, thereby reducing fire risk. Secondary containment areas are backup containment areas within secondary firebreaks that do not exist at present.

- Establish fire exclusion areas – These include areas outside of containment areas that contain high value resources and merit increased fire protection and suppression capabilities to protect those resources.
- Implement temporal constraints and other training restrictions during the high fire danger period (15 May through 30 September) – Analysis of current YTC data indicates that most fires start between 1200 and 1800 hours, during the high fire danger period (15 May through 30 September). YTC has used this information as criteria on the proposed fire matrix to identify a defined time period exhibiting high potential for ignition.
- Increase wildland fire staffing – YTC lacks sufficient staff to support wildland fire management requirements. YTC will provide additional staff necessary to support wildland fire management requirements associated with current and increased training activities associated with GTA actions.
- Provide wildland fire suppression equipment – Existing wildland fire suppression equipment is insufficient to support proposed increased wildland fire management staffing levels and anticipated prevention and suppression requirements associated with increased GTA training activities.
- Continue aerial fire suppression capability.
- Develop additional water resources for fire suppression – Analysis of existing water developments on YTC identified areas that lack sufficient aerial fire suppression water resources to support current and increased training activities. Establishment of water resources in areas where they currently do not exist or where enhancement of existing water resources is required will reduce response times resulting in improved fire suppression effectiveness.
- Conduct firebreak update and maintenance – This mitigation is an expansion of the current firebreak maintenance program, and includes establishment of new firebreaks around primary and secondary containment areas, as well as regular reassessment of the firebreak system in order to make necessary adjustments (**Figure 6-2**). All firebreaks will be maintained on an annual basis, prior to the fire season.
- Conduct site restoration for wildland fire impacts – This mitigation measure addresses the current backlog of restoration needed to repair the damage caused by previous fire impacts and includes a system for prioritizing restoration efforts. The Army has identified that during the first 5 years after the implementation of this mitigation, a substantial restoration effort would be required in order to start the restoration process in all the identified areas. It is estimated that restoration efforts would occur on 9,500 acres annually over the first 5 years, and would occur on 6,300 acres annually thereafter. The recurring acreage is based on the annual acreage burned at present, under the assumption that the fire mitigation measures presented here would keep the annual burned acreage at or below this level by adequately mitigating for increased risks associated with increased training under the proposed action. If the annual burned acreage is reduced, the annual restoration acreage would decrease accordingly.
- Continue to implement the Training Land Recovery Program – The Training Land Recovery Program exists currently; however, there are no established criteria for determining when or for how long an area should be closed to certain training activities. This mitigation defines a process for taking damaged areas off-line and requires a restriction of ground-disturbing activities for at least one complete growing season. Protection periods may be extended to allow for long-term site-specific objectives requiring extended rest or recovery periods.



Legend

- Yakima Training Center Boundary
- Interstate Highway
- State Route
- Federal Highway
- Secondary / Light Duty
- Water
- Perennial Stream
- Municipal Area
- County Boundary
- Ginkgo State Park
- Secondary Containment Areas
- Primary Containment Areas
- Primary and Secondary Containment Areas
- Impact Areas
- Range Firing Fans



FORT LEWIS GTA EIS

*Figure 6-2
Containment Areas on the
Yakima Training Center*

ANALYSIS AREA: Yakima & Kittitas Counties, Washington	
Date: 04/26/2010	File: FortLewis\Yak_Firebreaks.mxd
Prepared By: MSH	Layout: Yak_Firebreaks.pdf

- Provide additional range inspectors – Currently, there is a lack of staff to adequately monitor training unit compliance with land use policies and procedures. Hiring additional Range Inspectors would allow compliance monitoring to ensure that training units are following all regulations in place to protect resources.

6.6 CULTURAL RESOURCES

6.6.1 Resource-specific Significance Criteria

Impacts to cultural resources on YTC from all alternatives were assessed by evaluating the degree to which impacts would:

- Cause adverse effects to an NRHP-eligible or listed historic property, of which examples include: damaging, or neglecting to prevent damage to, an archaeological site in a training area; or restricting access to traditional cultural practices or places, including culturally important plant or animal resources, particularly during specific times of the year when such resources are traditionally used, collected, or visited;
- Jeopardize compliance with ARPA or RCW 27.53 through actions including, but not limited to: construction in areas that have not been cleared for archaeological resources; unauthorized digging of emplacements or other ground-disturbing actions; accidental or willful disregard for Seibert-staked archaeological sites in training areas by Soldiers or contractors; or failure to report damage to archaeological sites;
- Jeopardize compliance with AIRFA by creating conditions that prevent the use of sacred or religious sites or resources, such as restricting access to times that conflict with their traditional use, or by increasing noise to levels incompatible with their use.

6.6.2 Overview of Impacts to Cultural Resources by Alternative

Table 6-13 summarizes the impacts on cultural resources that would occur under each of the alternatives.

Table 6-13 Summary of Potential Impacts to Cultural Resources at YTC

Activity Group	Alt 1	Alt 2	Alt 3	Alt 4
Construction Direct and Indirect Effects	•	•	•	•
Live-fire Training Direct and Indirect Effects	•	•	•	•
Maneuver Training Direct and Indirect Effects	€	€	€	€
Cumulative Effects	€	€	€	€

U = Significant Effects

W = Significant but Mitigable to less than Significant Effects

€ = Less than Significant Effects

+ = Beneficial Effect

N/A = Not Applicable

• = No Effects

6.6.3 Alternative 1 — No Action Alternative

6.6.3.1 Construction Direct and Indirect Effects

6.6.3.1.1 No Effects

No new cantonment area or range construction is proposed at YTC under Alternative 1. There are currently no NRHP-eligible historic districts or buildings on YTC. Buildings in the cantonment area

that date to the 1950s and later that are not covered by the national PA addressing World War II-era temporary structures would be evaluated for their NRHP eligibility as they reach 50 years of age.

Because all of the cantonment area (approximately 1,700 acres [690 ha]) has been surveyed with negative results for archaeological sites, there are no anticipated impacts to archaeological resources from future construction.

6.6.3.2 *Live-fire Training Direct and Indirect Effects*

6.6.3.2.1 *No Effects*

Because Soldiers would continue to access live-fire training areas on established roads and paths, no impacts to known or unknown archaeological resources are expected. Impacts from ordinance explosions are not expected.

Impacts to traditional cultural places or resources can only be identified by those who value and use the resource. Previous consultation with the Yakama and Wanapum tribes has not identified impacts from noise levels incompatible with the traditional or ceremonial use of places or resources on YTC, or restricted access to areas that may contain those resources. All training complexes within YTC contain habitat that supports plants that are culturally important to tribes.

6.6.3.3 *Maneuver Training Direct and Indirect Effects*

6.6.3.3.1 *Less than Significant Effects*

YTC contains more than 1,000 archaeological sites distributed throughout all training/range areas. Maneuver training can cause direct impacts to archaeological resources from off-road vehicle use (tracked and wheeled vehicles), excavation and earth-moving activities (e.g., digging weapon or tank emplacements), or rutting and erosion near wetlands or streams. Under Alternative 1, the location, frequency, and intensity of maneuver training would remain the same (1,810,000 miles annually, of which 370,000 are off-road miles). Some archaeological sites on YTC that are protected by Seibert stakes have been disturbed by vehicle encroachment of the site boundary; other disturbances may have been present before the installation of Seibert stakes. It is probable that impacts to archaeological sites from vehicle disturbance would continue under Alternative 1, particularly if Soldiers or contractors are not informed about the location of, or purpose for, protected sites. However, such impacts are expected to be less than significant, as site protection measures and cultural resource awareness training for soldiers improves.

Maneuver training areas on YTC contain places and plant and animal resources that are important to the Yakama and Wanapum tribes for their traditional or ceremonial use. Previous consultation with the tribes has not identified impacts to such resources from vehicle use, habitat degradation, or restricted access associated with maneuver training.

6.6.4 Alternative 2 — GTA Actions

6.6.4.1 *Construction Direct and Indirect Effects*

6.6.4.1.1 *No Effects*

Construction in live-fire ranges proposed under Alternative 2 is not expected to result in impacts to archaeological sites, as these areas can be avoided during the planning process by surveying the area prior to ground disturbance.

No direct impacts from restricted access to places or resources important to the Yakama and Wanapum tribes for traditional or ceremonial use are expected from construction of planned range projects.

6.6.4.2 *Live-fire Training Direct and Indirect Effects*

6.6.4.2.1 *No Effects*

Because increased numbers of Soldiers would access live-fire training areas on established roads and paths under Alternative 2, no impacts to known or unknown archaeological resources from vehicle disturbance are expected. Impacts from ordinance explosions are not expected.

Alternative 2 would likely increase the duration and frequency of noise levels from large-caliber weapons due to intensified use of live-fire training areas. All training complexes on YTC contain habitat that supports culturally important places and resources; however, as discussed under Alternative 1, consultation to date with the Yakama and Wanapum tribes has not identified impacts to tribal traditional resources from incompatible noise levels or restricted access associated with live-fire training.

6.6.4.3 *Maneuver Training Direct and Indirect Effects*

6.6.4.3.1 *Less than Significant Effects*

The probability of impacts to archaeological sites from vehicle disturbance due to increased off-road vehicle miles traveled under Alternative 2 would likely increase as the use of training areas is intensified to accommodate more Soldiers, particularly if Soldiers or contractors are not informed about the location of, and purpose for, Seibert-staked sites. These impacts cannot be identified in advance because the use of specific training areas that may also contain archaeological sites is not known at this time. However, as discussed under Alternative 1, impacts are expected to be less than significant. Maneuver training areas contain places and plant or animal resources that are important to the Yakama and Wanapum tribes for their traditional or ceremonial use. Intensified use of training areas under Alternative 2 could impact such resources through vehicle use, habitat degradation, or restricted access at certain times of the year. Previous consultation with the tribes has not identified impacts to such resources.

6.6.5 Alternative 3 — GTA Actions + CSS Soldiers

6.6.5.1 *Construction Direct and Indirect Effects*

6.6.5.1.1 *No Effects*

No additional construction projects would occur under Alternative 3. The two range projects discussed under Alternative 2 would be constructed under Alternative 3 with no expected impacts to archaeological or tribal cultural resources.

6.6.5.2 *Live-fire Training Direct and Indirect Effects*

6.6.5.2.1 *No Effects*

Because Soldiers would access live-fire training areas on established roads and paths, impacts to known or unknown archaeological resources from vehicle disturbance are not expected under Alternative 3.

Use of training ranges and areas would likely intensify under Alternative 3 with the need to accommodate more Soldiers completing their training, and therefore, noise levels are likely to increase. However, as noted previously, tribal consultation to date has not identified impacts from noise to the use of places or resources that are important to the tribes.

6.6.5.3 *Maneuver Training Direct and Indirect Effects*

6.6.5.3.1 *Less than Significant Effects*

As with Alternative 2, while the probability of impacts to known or unknown archaeological sites from increased off-road miles traveled would likely increase under Alternative 3, these impacts cannot be identified in advance because the use of specific training areas that may also contain archaeological sites is not known at this time. However, as noted previously, such impacts are expected to be less than significant.

6.6.6 Alternative 4 — GTA Actions + CSS Soldiers + Medium CAB

6.6.6.1 *Construction Direct and Indirect Effects*

6.6.6.1.1 *No Effects*

No new range projects would be constructed under Alternative 4. The two range projects discussed under Alternative 2 would be constructed with no expected impacts to archaeological or tribal cultural resources.

6.6.6.2 *Live-fire Training Direct and Indirect Effects*

6.6.6.2.1 *No Effects*

As with Alternatives 2 and 3, live-fire training impacts to archaeological sites are not expected. Tribal consultation to date has not identified impacts to the use of places or resources that are important for their traditional or ceremonial use from incompatible noise levels or restricted access.

6.6.6.3 *Maneuver Training Direct and Indirect Effects*

6.6.6.3.1 *Less than Significant Effects*

As with Alternatives 2 and 3, the probability of impacts to archaeological sites from increased off-road vehicle miles would likely increase under Alternative 4. As previously noted, these impacts cannot be identified in advance because the use of specific training areas that also contain archaeological sites is not known at this time, but are expected to be less than significant.

No new flight training routes at YTC for the medium CAB have been identified for Alternative 4. Intensified use of established training flight routes for Low-level, Terrain or Contour, and NOE aviation training with fixed-wing and rotary-blade aircraft is not expected to result in significant increased noise levels along flight routes or entry and exit points. Consultation to date with the Yakama and Wanapum tribes has not identified impacts to traditional cultural places or resources from incompatible noise levels or restricted access associated with aviation-based training on YTC.

6.6.7 Cumulative Effects

6.6.7.1 *Less than Significant Effects*

Potential impacts to archaeological sites under all alternatives from the failure of site protection measures could result in the eventual loss of important archaeological data. Such a cumulative loss

may eventually become significant, but the conditions under which site protection measures fail, or the specific sites that may be impacted when they do, means that the significance of cumulative effects from data loss cannot be determined in advance. It appears that site protection measures in place at YTC are effective and ongoing impacts are relatively minimal. Efforts to increase awareness of the need to protect archaeological sites on YTC among troops is likely to result in no significant future loss of archaeological data. This analysis of impacts includes potential cumulative effects from an expected increase in troop levels when the HIMARS training program is implemented.

Consultation with the Yakama and Wanapum tribes to date has not identified noise impacts to the use of places or resources that are important to the tribes, thus cumulative effects from increased noise to levels seems unlikely. The anticipated annual HIMARS rocket launches would occur at specific intervals, which could be coordinated with the use of important tribal resources, and is therefore unlikely to lead to significant impacts from increased noise levels. YTC has been able to coordinate acceptable access to important tribal cultural resources with the tribes to date; because no adverse impacts from restricted access have been identified, the potential for significant impacts (i.e., long-term or permanent interruption) to traditional tribal practices is unlikely.

6.6.8 Mitigation

Potential impacts to archaeological sites on YTC from ground disturbance under all alternatives would be avoided, minimized, or mitigated through compliance with the PA and SOPs (**Appendix D**). Areas that have not been surveyed for archaeological resources would be restricted for training purposes until cleared by the YTC CRM.

The PA and SOPs in **Appendix D** stipulate the procedures by which the Army would consult with the Yakama and Wanapum tribes to identify and resolve impacts that may be identified from future GTA actions. Coordination between the tribes and the YTC ENRD would ensure that potential impacts to the traditional use of YTC lands are avoided or minimized. The results of consultation to identify potential impacts and/or mitigation measures that the tribes wish to keep confidential may not be documented as provided for by federal authorities.

6.7 AIR QUALITY

The potential for impacts to air quality, and resulting effects on human health and climate change, from proposed construction/demolition activities and long-term operations associated with GTA actions was identified as an issue of concern during scoping. In addition, the potential for increased fire danger resulting from increased live-fire training use of YTC was of concern. Increased fire incidence would lead to increased smoke production and potential human and animal health issues.

The activity that is most likely to affect air quality on and near YTC is training, as it would generate smoke, fugitive dust, and exhaust emissions. Construction activities would have a minor impact on air quality.

6.7.1 Resource-specific Significance Criteria

Impacts to air quality would be considered significant if the proposed activities were to:

- Increase ambient air pollutant concentrations above any NAAQS at the installation boundary;
- Contribute to an existing violation of any NAAQS;
- Interfere with or delay timely attainment of NAAQS;

- Impair visibility within any federally mandated PSD Class I area; or
- Produce emissions of hazardous air pollutants exceeding state or federal emission levels at the installation boundary.

6.7.2 Overview of Impacts to Air Quality by Alternative

Table 6-14 summarizes the impacts associated with air quality that would occur under each of the alternatives.

Table 6-14 Summary of Potential Effects to Air Quality at YTC

Activity Group	Alt 1	Alt 2	Alt 3	Alt 4
Construction Direct and Indirect Effects	•	€	€	€
Live-fire Training Direct and Indirect Effects	€	€	€	€
Maneuver Training Direct and Indirect Effects	€	€	€	€
Cumulative Effects	€	€	€	€

U = Significant Effects

W = Significant but Mitigable to less than Significant Effects

€ = Less than Significant Effects

+ = Beneficial Effect

N/A = Not Applicable

• = No Effects

6.7.3 Emission Sources

The major pollutants in the Yakima region and on YTC are vehicular emissions (primarily CO, NO_x, and VOCs). In addition, particulate emissions (PM₁₀ and PM_{2.5}) are generated by military vehicles traveling on unpaved roads and off road, and by military aircraft. The number of vehicles and aircraft used during training would vary among alternatives, as would the number of miles traveled by vehicles and aircraft. Thus, air emissions associated with vehicle and aircraft use and mileage are estimated and analyzed in this EIS. Emissions from portable generators used during training exercises are also estimated.

Impacts to air quality from Army activities also include emissions from training-related fires; stationary sources, such as heating plants; dust and exhaust emissions from mobile sources, such as construction equipment and personal vehicles; and hazardous emissions from building demolition, maintenance and repair shops, and other activities. However, emissions associated with these sources were not evaluated in the EIS because they are not regulated, would not be changing under the alternatives, or are negligible. The number of personnel training and working at YTC is expected to remain near current levels under all alternatives. Thus, personal vehicle emissions would not differ much from current levels.

Current construction plans do not include the installation of any new or modified air emission sources. Emissions associated with training support activities, including fuel storage and transfer, painting operations, and generator usage (which were evaluated in the 1994 Stationing EIS), would not change significantly from levels in 1994 under any of the alternatives. YTC has decommissioned three natural gas boilers as of June 2009, which will help to reduce emissions on the installation. If YTC were to install a new or modified air emission source in the future, the impacts would be evaluated in a Notice of Construction application submitted to the YRCAA or Washington Department of Ecology. If applicable, new air emission sources would comply with all federally established new source performance standards, national emission standards for hazardous air pollutants, and NAAQS. In addition, the emission sources would comply with all state and local emission standards and ambient air quality standards.

6.7.4 General Conformity Determination

The “general conformity” rule (40 CFR Subpart W, 51.850) requires a review of proposed federal actions that may affect air quality in nonattainment and maintenance areas. A conformity analysis must demonstrate that the project would not:

- Cause or contribute to a new violation of any standard;
- Interfere with the provisions in the applicable State Implementation Plan (SIP) for maintenance of any standard;
- Increase the frequency or severity of any existing violation of any standard; or
- Delay timely attainment of any standard.

Additional thresholds are pollutant-specific for nonattainment and maintenance areas. Air quality on YTC is generally considered good, although it can degrade rather quickly when particulate matter is generated by rangeland fires and maneuver training activities. However, particulate matter commonly dissipates quickly as a result of the predominant winds from the west-southwest. A very small strip of YTC’s western cantonment area (less than 100 acres; 40 ha) lies within a maintenance area for PM₁₀. Therefore, this small portion of the cantonment area is subject to a general conformity threshold of 100 tons (91 metric tons) per year for PM₁₀. A portion of Yakima County is also a maintenance area for CO; therefore, impacts of CO are also addressed in this EIS. A conformity analysis for the proposed Army actions is presented under each alternative.

6.7.5 Description of Methodology to Evaluate Air Emissions

6.7.5.1 Emissions Calculations

Emissions for all criteria pollutants were calculated for each alternative and compared to the conformity thresholds where applicable.

Emissions for all criteria pollutants were calculated for each alternative and compared to the conformity thresholds where applicable. **Table 6-15** summarizes the emissions sources calculated and the method used to perform the calculation. If total project emissions are lower than the conformity threshold, then air quality impacts would not be significant. In cases where total project emissions exceeded conformity thresholds, dispersion modeling of these pollutants for short-term and annual periods was completed to determine whether NAAQS would be exceeded or impacted by the proposed activities, resulting in significant impacts to air quality.

Table 6-15 Emissions Sources and Calculation Methods

Emission Category	Calculation Method
Training Activities	AP-42 Section 13.2.1 (Paved Roads) and Section 13.2.2 (Unpaved Roads) equations to calculate PM ₁₀ and PM _{2.5} . These equations consider the silt and moisture content of the soil, precipitation, and vehicle weight when determining the amount of dust generated by a military vehicle.
Generators	EPA Tier 2 Engine emission factors calculate vehicle exhaust emissions.
Aircraft	AP-42 Section 3.3 – Gasoline and Diesel Industrial Engines Table 3.3-1 Emissions and Dispersion Modeling System (EDMS Version 5.1) calculates aircraft exhaust based on number of landing and takeoff cycles.

6.7.5.2 Dispersion Modeling Analysis

Air pollution models are used to make future projections of air pollution levels or to estimate current pollution levels at locations where monitors are not deployed. Air pollution models are most frequently used to verify that a new source of air pollution will not exceed federal health-based (NAAQS) standards. The models are generally designed to provide overestimates of air pollution concentrations in order to be protective of air quality, and must be approved by the EPA. In general, all air quality models require information about the pollutant source being modeled, including pollutant emission rate, and information about the dispersing characteristics of the meteorology, such as wind speed and direction.

Impacts from criteria pollutants CO and PM₁₀ were modeled for short-term periods and annual periods using AERMOD. Meteorological data used in the modeling were obtained from the National Weather Service stations at the Yakima Airport and Spokane Airport for the years 2002 through 2006. To ensure that pollutants associated with military vehicles would not adversely affect the health of people off Post, one set of densely spaced modeling receptors was placed along the installation boundary bordering the maintenance area, and another set was placed 1,640 feet (500 m) outside the boundary. Additional receptors were placed out to 3 miles (5 km) from the facility boundary for further assessment of off-site impacts in the maintenance area.

6.7.5.3 Source Characterization

An emission rate was calculated for each maneuver area in grams/second per m². To simulate the emissions from exhaust and airborne dust correctly, the total height of the emission exhaust and the initial Sigma Z (initial vertical dimension of the area source plume) was set to 1.5 times the actual height of the Stryker vehicle. This height represents the dust wake created by Stryker vehicles. Emissions from generators and helicopters were also factored into the area source emission rates.

6.7.5.4 PSD Applicability

The PSD baseline date for YTC is December 14, 1977. In June 1979, the Department of the Army submitted an EIS that summarized the emissions at both facilities. At YTC, particulate emissions were estimated at approximately 49,500 tons (44,900 metric tons) per year. The EIS stated that most of the 49,500 tons per year was due to tracked vehicles' emissions on unimproved (unpaved) roads.

For future maneuvers at YTC, emissions were estimated as follows:

- Strykers travel 625 miles (1,000 km) per day for a company-level event. Conservatively, if 174 of these maneuvers were performed each year, the total particulate emissions would be 1,000 (907 metric tons) tons per year, well under the baseline emission rate of 49,500 tons (44,900 metric tons) per year.

Given that the emissions from the future planned activities would be lower than the baseline emissions at both facilities; this modeling analysis did not consider PSD increment consumption and visibility impacts.

6.7.6 Alternative 1 — No Action Alternative

6.7.6.1 Construction Direct and Indirect Effects

6.7.6.1.1 No Effects

No construction is proposed at YTC under Alternative 1; therefore, no impacts on air quality from construction would occur. Minor building maintenance and repair projects would continue to occur; however, there are no plans to install any new or modified air emission sources on YTC.

6.7.6.2 Live-Fire Training Direct and Indirect Effects

6.7.6.2.1 Less than Significant Effects

The risk of fire associated with live-fire training would not increase under this alternative, and wildland fires would be expected to affect roughly the same average acreage annually (several thousand acres) as at present, with occasional large fires. Fires would have short-term effects on air quality by emitting CO₂, CO, PM₁₀, PM_{2.5}, and VOCs as plant materials are consumed, but would be recurrent. Air quality in the area of the fire would be temporarily affected, but effects would be less than significant. Fire management programs would continue to be in place to minimize the risk of fire.

The Army would conduct prescribed burns to minimize the risks associated with training-induced fires. When managed properly, prescribed fires can be conducted to remove fuel while minimizing impacts to air quality by controlling the extent and intensity of the burn. Prescribed burning activities would be coordinated with local and regional air agencies to ensure that air quality is not adversely affected.

6.7.6.3 Maneuver Training Direct and Indirect Effects

6.7.6.3.1 Less than Significant Effects

The potential impacts to air quality from training activities under Alternative 1 were analyzed in the EAs prepared for the two SBCTs and other units stationed at Fort Lewis, but that train at YTC (Army 2001b, 2004b). These EAs predicted no significant impacts to air quality under the existing management policies and with additional mitigation measures in place. Types of equipment with the most potential to affect air quality during training on YTC include Stryker vehicles, fog oil/graphite smoke generators, and smoke munitions. The impacts of smoke generators and smoke munitions on air quality on YTC were analyzed by the Army (1999, 2001d). Smoke use is currently much lower than amounts assessed in these earlier EAs, and effects are negligible. Impacts to air quality from use of Stryker vehicles during training activities are discussed in the following section.

Under the current levels of training, military vehicles would continue to have moderate short-term impacts on ambient air quality at YTC. Modeling showed that current Stryker vehicle activity would not cause or contribute to an NAAQS violation (Army 2001b). Emissions of criteria pollutants associated with training increases were determined to be less than significant based on projected MIL-CLASS 4 and 5 and off-road miles (148,800 miles [239,420 km]) traveled by Strykers annually during training. Pollutants generated by Stryker and other military vehicles during training would not cause an air quality violation at YTC and would not adversely affect the health of humans off the installation. The modeling results are conservative, with all Stryker vehicles assumed to be concentrated in a very small area and operated at peak engine output constantly for periods up to 24 hours, and at 90 percent of capacity for periods greater than 24 hours.

The Army would be required to comply with federal, state, and local air quality regulations. Compliance with these regulations would continue to be the responsibility of the YTC Air Quality Program. The Army would continue to manage resources to reduce erosion and revegetate degraded areas to reduce the amount of dust produced during training exercises.

6.7.7 Alternative 2 — GTA Actions

Projected annual emissions under Alternative 2 are presented in **Table 6-16** (see **Appendix E** for calculations).

Table 6-16 Sources and Estimated New Emissions at YTC under Alternative 2

Source	Estimated New Annual Emissions (tpy)					
	CO	NO ₂	VOCs	SO ₂	PM ₁₀	PM _{2.5}
Stryker vehicle training	85.81	74.64	74.64	3.40	2,893.49	299.22
Other wheeled vehicle training	1.20	0.84	0.84	0.04	26.27	2.71
Generators	5.05	23.44	1.87	1.55	1.66	1.66
Military vehicle fuel station usage	0	0	0.92	0	0	0
Total emissions	92.06	98.92	78.27	4.99	2,921.42	303.59
Conformity Threshold	100	N/A ¹	N/A	N/A	100	N/A

Note:

1. N/A = Not applicable because the area is in attainment for this pollutant.

See **Appendix E** for calculations of emissions.

6.7.7.1 Construction Direct and Indirect Effects

6.7.7.1.1 Less than Significant Effects

Current construction plans do not include the installation of any new or modified air emission sources on YTC. Under Alternative 2, two range construction projects would occur at YTC outside of the cantonment area (**Figure 2–5**). Over the short-term, minor air quality impacts would result from operation of heavy-duty construction equipment, installation of temporary heaters, demolition, and increased vehicular traffic attributed to construction personnel. The Army will submit all required plans, applications and fees to the appropriate regulatory agencies prior to commencement of project activities. Based on a description of the project, the following will likely be required: (1) a New Source Review Order of Approval may be required based on the equipment to be installed; (2) Prior to demolishing any structures an asbestos survey must be done by a certified asbestos building inspector; (3) Any asbestos found must be removed by a licensed asbestos abatement contractor prior to demolition; (4) A Notification of Demolition and Renovation application must be filed with the Yakima Regional Clean Air Agency (YRCAA) and the appropriate fee should be paid; and (5) Contractors doing demolition, excavation, clearing, construction, or landscaping work must file a Dust Control Plan with YRCAA, prior to the start of any of the work.

Since the number of personnel at YTC, would remain at or near current levels, air emissions associated with personal vehicles would remain much the same as under Alternative 1.

6.7.7.2 Life-Fire Training Direct and Indirect Effects

6.7.7.2.1 Less than Significant Effects

Under Alternative 2, the increase in frequency of live-fire training would likely result in an increase in wildland fires. Impact areas on YTC, and particularly the CIA, are subject to repeated low-fuel fires and therefore have a low buildup of heavy fuels. Most fires in the impact areas are low-intensity burns in fire-adapted systems that would not be expected to have significant or lasting effects on the human environment.

Pollutants associated with smoke from fire include CO₂, CO, PM₁₀, PM_{2.5}, VOCs, and water vapor, with CO₂ and water vapor comprising about 90 percent of the emissions (Prescribed Fire and Fire Effects Working Team 1985). CO₂ and water vapor do not have direct health or visibility effects, but both are greenhouse gases that can contribute to climate change. CO accounts for nearly 6 percent of the total mass emitted during burning, PM accounts for approximately 2 percent, and VOCs account for nearly 1 percent. The total amount of these pollutants emitted annually would depend on the number and size of the fires and the amount of fuel consumed. The additional fires resulting from this alternative would most likely be small fires in impact areas, which would contribute relatively small amounts of air pollutants to the atmosphere. It is possible, however, that the additional training

could result in a large fire with more fuel and therefore greater levels of pollutants. These fires would be infrequent, and their impacts to air quality would occur only for a short period of time. Therefore, impacts would not be significant.

YTC's wildland fire management program, as described in **Section 6.5**, would continue to be implemented to minimize the risk of fire, although it is expected that the incidence of fire, as well as associated air effects, would still be greater under this alternative than under Alternative 1.

Given that the closest PSD Class I Area is located approximately 60 miles (97 km) from YTC, additional fires under this alternative are not expected to impair visibility in any Class I Areas.

6.7.7.3 Maneuver Training Direct and Indirect Effects

6.7.7.3.1 Less than Significant Effects

Under Alternative 2, there would be an increase in training activities on YTC, which could result in an increase in the amount of fugitive dust, exhaust pollutants, and smoke produced relative to Alternative 1.

Table 6-16 summarizes the predicted emissions generated by Strykers and support vehicles on YTC under Alternative 2. Combustion of diesel fuel by Strykers would generate approximately 85.81 tons of CO, 74.64 tons of NO₂, 3.40 tons of SO₂, and 74.64 tons of VOCs from exhaust, while 2,893.49 tons of dust would be generated annually during training exercises (**Appendix E**). Combustion of diesel fuel by support vehicles and trucks would generate 1.20 tons of CO, 0.84 ton of NO₂, 0.04 ton of SO₂, and 0.84 ton of VOCs from exhaust, and 26.27 tons of dust annually during training exercises (**Appendix E**).

Increased fuel storage and transfer for military vehicles would generate approximately 1 ton of VOCs annually. Increases in fuel storage and transfer would result from the need to provide fuel to new vehicles. These VOCs are emitted from vents on storage tanks and during the transfer of fuel from the storage tank to the vehicle.

Increased generator usage in the field would generate approximately 5 tons of CO, 23 tons of NO_x, 2 tons of SO₂, 2 tons of VOCs, and 2 tons of PM₁₀ and PM_{2.5} annually (**Table 6-16**). These emissions would be associated with exhaust from generators used during field exercises.

Under Alternative 2, there would be an increased potential for hazardous air pollutants to be released on YTC relative to Alternative 1, due to increased fuel usage and vehicle maintenance activities. All fuel storage and transfer activities and vehicle maintenance activities would follow air quality compliance procedures that meet NESHAPs. Therefore, significant effects to air quality associated with hazardous air pollutants would not be expected to occur.

Criteria and toxic air pollutants would be generated during smoke training. Air emissions associated with different levels of smoke training on YTC were evaluated in the *Final Environmental Assessment for the Fielding of M56 and M58 Smoke Generators at Fort Lewis and Yakima Training Center* (Army 1999), and in the *Final Environmental Assessment for Training with Smoke Munitions at Fort Lewis and Yakima Training Center, Washington* (Army 2001d). To ensure the smoke training would not violate air quality standards, use of smoke munitions and generators would not exceed the limits identified in these two EAs. Smoke use is currently much lower than amounts assessed in these earlier EAs, and would not increase under Alternative 2; effects would remain negligible.

6.7.7.4 Conformity Analysis

Less than 100 acres (40 ha) of the YTC cantonment area are within a PM₁₀ maintenance area, for which the increase threshold for a conformity analysis is 100 tons (91 metric tons) per year. Based

on total predicted new emissions occurring under Alternative 2, a conformity determination would be triggered for PM₁₀. Only a small portion of the proposed training would occur within this portion of the YTC cantonment area, as dust can be generated by vehicles driving on paved roads.

To determine whether the actions under Alternative 2 would cause a violation of the NAAQS, dispersion modeling was performed for emissions of PM₁₀. The results of this modeling are presented in **Table 6-17**.

Table 6-17 Air Pollutant Concentrations Modeled at the YTC Installation Boundary (Including Monitored Background¹) under Alternative 2

Training Area	Pollutant Concentrations (µg/m ³) ¹	
	24-hr PM ₁₀	Annual PM ₁₀
TA1	2.06	N/A
TA2	0.85	N/A
TA3	1.08	N/A
TA4	0.57	N/A
TA5	1.63	N/A
TA6	2.52	N/A
TA7	1.80	N/A
TA8	2.04	N/A
TA9	2.50	N/A
TA10	5.12	N/A
TA11	4.32	N/A
TA12	4.62	N/A
TA13	46.43	N/A
TA14	12.50	N/A
TA15	2.99	N/A
TA16	1.37	N/A
AA1	41.89	N/A
AA2	41.21	N/A
AA3	17.97	N/A
SDZ	5.61	N/A
MPRC	1.68	N/A
MPTR	2.66	N/A
All Training Areas	N/A	0.57
Maximum Modeled Concentration	46.43	0.57
Monitored Background	59.0	23.0
Total Impact	105.43	23.57
NAAQS	150	50

Note:

1. Includes Monitored Background, which refers to background concentrations of pollutants from natural sources, nearby sources, and unidentified sources. Source of background air data is EPA 2007.

These results indicate that emissions of PM₁₀ would be less than the NAAQS. Therefore, YTC would prepare a FONSI to the General Conformity Rule under this alternative.

Training at YTC would not cause or contribute to an air quality violation at the installation boundary under Alternative 2, and would not adversely affect the health of humans off the installation. Therefore, air quality impacts associated with training would be less than significant.

6.7.8 Alternative 3 — GTA Actions + CSS Soldiers

Projected annual emissions under Alternative 3 are presented in **Table 6-18** (see **Appendix E** for calculations).

Table 6-18 Sources and Estimated New Annual Emissions at YTC under Alternative 3

Source	Estimated New Annual Emissions (tpy)					
	CO	NO ₂	VOCs	SO ₂	PM ₁₀	PM _{2.5}
Stryker vehicle training	85.81	74.64	74.64	3.40	2,893.49	299.22
Other wheeled vehicle training	1.20	0.84	0.84	0.04	26.27	2.71
CSS wheeled vehicle training	2.55	2.16	2.16	0.18	29.78	4.03
Generators	5.37	24.92	1.99	1.65	1.81	1.81
Military vehicle fuel station usage	0	0	1.02	0	0	0
Total emissions	94.93	102.56	80.65	5.27	2,951.35	307.77
Conformity Threshold	100	N/A ¹	N/A	N/A	100	N/A

Note:

1. N/A = Not applicable because the area is in attainment for this pollutant.

See **Appendix E** for calculations of emissions.

6.7.8.1 Construction Direct and Indirect Effects

6.7.8.1.1 Less than Significant Effects

No additional construction projects above those described for Alternative 2 would occur under this alternative, and the number of personnel at YTC would remain at or near current levels. Therefore, associated air quality impacts would be the same as those described for Alternative 2.

6.7.8.2 Live-Fire Training Direct and Indirect Effects

6.7.8.2.1 Less than Significant Effects

Under Alternative 3, there would only be a slightly greater amount of live-fire training than under Alternative 2. Therefore, the associated risk of fire and resultant air quality impacts would be similar to those described under Alternative 2 and would be less than significant.

6.7.8.3 Maneuver Training Direct and Indirect Effects

6.7.8.3.1 Less than Significant Effects

Under Alternative 3, the amount of fugitive dust, vehicle exhaust pollutants, and other emissions associated with maneuver training would be greater than under Alternatives 1 and 2, because of the added training by CSS vehicles. **Table 6-18** summarizes the amount of pollutants generated by SBCT vehicles and CSS support vehicles at YTC. These emissions would include approximately 89.56 tons of CO, 77.64 tons of NO₂, 3.62 tons of SO₂, and 77.64 tons of VOCs from exhaust, and 2,949.54 tons of dust annually during training exercises (See **Appendix E** for more information). These estimates amount to only 1 to 3 percent greater emissions than under Alternative 2.

Increased fuel storage and transfer associated with military vehicles would generate approximately 1.02 tons of VOCs annually (**Table 6-18**), which is a negligible increase over Alternative 2. Emissions associated with generator usage would be slightly greater than those under Alternative 2, at approximately 5.32 tons of CO, 24.92 tons of NO₂, 1.99 tons of VOCs, 1.66 tons of SO₂, 1.76 tons of PM₁₀, and 1.76 tons of PM_{2.5} annually. These emissions are 5 to 6 percent greater than those under Alternative 2.

Under Alternative 3, there would be a slightly greater potential for hazardous air pollutants to be released on YTC than under Alternative 2. All fuel storage and transfer activities and vehicle maintenance activities would follow air quality compliance procedures that meet NESHAPs, and significant effects to air quality would not be expected to occur.

6.7.8.4 Conformity Analysis

Based on total predicted new emissions occurring under Alternative 3, a conformity determination would be triggered for PM₁₀. To determine whether the proposed actions under Alternative 3 would cause a violation of the NAAQS, dispersion modeling was performed for PM₁₀. The results of this modeling are presented in **Table 6-19**. These results indicate that the emissions would be less than the NAAQS. Therefore, training at YTC would not cause or contribute to an air quality violation at the installation boundary under Alternative 3. YTC would prepare a FONSI to the General Conformity Rule under this alternative. The projected increase in PM of 2,951 tons per year, most of which would originate outside the PM maintenance area, would not constitute a significant adverse effect to air quality under Alternative 3.

Table 6-19 Air Pollutant Concentrations Modeled at the YTC Installation Boundary (Including Monitored Background) under Alternative 3

Training Area	Pollutant Concentrations (µg/m ³) ¹	
	24-hr PM ₁₀	Annual PM ₁₀
TA1	2.09	N/A
TA2	0.87	N/A
TA3	1.11	N/A
TA4	0.58	N/A
TA5	1.66	N/A
TA6	2.58	N/A
TA7	1.84	N/A
TA8	2.08	N/A
TA9	2.56	N/A
TA10	5.22	N/A
TA11	4.40	N/A
TA12	4.72	N/A
TA13	47.39	N/A
TA14	12.76	N/A
TA15	3.05	N/A
TA16	1.39	N/A
AA1	42.76	N/A
AA2	42.09	N/A
AA3	18.36	N/A
SDZ	5.73	N/A
MPRC	1.72	N/A
MPTR	2.73	N/A
All Training Areas	N/A	0.59
Maximum Modeled Concentration	47.39	0.59
Monitored Background	52	22
Total Impact	99.39	22.59
NAAQS	150	50

Note:

1. Includes Monitored Background, which refers to background concentrations of pollutants from natural sources, nearby sources, and unidentified sources. Source of background air data is EPA 2007.

6.7.9 Alternative 4 — GTA Actions + CSS Soldiers + Medium CAB

Projected annual emissions under this alternative are presented in **Table 6-20** (see **Appendix E** for calculations).

6.7.9.1 Construction Direct and Indirect Effects

6.7.9.1.1 Less than Significant Effects

No additional construction projects beyond those described for Alternative 2 would occur under this alternative, and the number of personnel would remain at or near current levels. Therefore, associated air quality impacts would be the same as those under Alternatives 2 and 3 and would be less than significant.

Table 6-20 Sources and Estimated New Annual Emissions at YTC under Alternative 4

Source	Estimated New Annual Emissions (tpy)					
	CO	NO ₂	VOCs	SO ₂	PM ₁₀	PM _{2.5}
Stryker vehicle training	85.81	74.64	74.64	3.40	2,893.49	299.22
Other wheeled vehicle training	1.20	0.84	0.84	0.04	26.27	2.71
CSS wheeled vehicle training	2.55	2.16	2.16	0.18	29.78	4.03
CAB wheeled vehicle training	2.33	1.95	1.95	0.16	71.17	7.32
Helicopters	8.52	0.71	7.01	0.25	0.26	0.26
Generators	10.50	48.72	3.88	3.22	3.46	3.46
Military vehicle fuel station usage	0	0	1.58	0	0	0
Total emissions	110.91	129.02	92.06	7.25	3,024.43	317
Conformity Threshold	100	N/A ¹	N/A	N/A	100	N/A

Note:

1. N/A = Not applicable because the area is in attainment for this pollutant.
See **Appendix E** for calculations of emissions.

6.7.9.2 Live-Fire Training Direct and Indirect Effects

6.7.9.2.1 Less than Significant Effects

Under Alternative 4, the amount of live-fire training, and therefore the risk of fire, would be greater than under the other alternatives. The total amounts of pollutants emitted annually in smoke from fire would depend on the number and size of the fires, and the amount of fuel consumed. It is expected that most of the additional fires under this alternative would be low-fuel fires that would contribute relatively small quantities of pollutants into the air. However, larger, more polluting fires in less fire-adapted habitats would also be a risk with the additional live-fire training. In all cases, impacts would last only a short amount of time. Additionally, existing fire management actions would continue to minimize the risk of larger fires, as discussed under Alternative 2. Effects to air quality would be less than significant.

Given that the closest PSD Class I Area is located approximately 60 miles (97 km) from YTC, additional fires under this alternative are not expected to impair visibility in any Class I Areas.

6.7.9.3 Maneuver Training Direct and Indirect Effects

6.7.9.3.1 Less than Significant Effects

Under Alternative 4, the amount of fugitive dust, vehicle exhaust, and other emissions associated with maneuver training would be greater than under the other alternatives, because of added training

by CAB vehicles and helicopters. **Table 6-20** summarizes the total estimated emissions associated with maneuver training under Alternative 4. These emissions would include 97.38 tons of CO, 84.21 tons of NO₂, 3.78 tons of SO₂, and 84.21 tons of VOCs from exhaust, and 3,201.67 tons of dust annually during training exercises (**Appendix E**). Combustion of diesel fuel by helicopters would generate 8.52 tons of CO, 0.71 ton of NO₂, 7.01 tons of VOC, and 0.25 ton of SO₂ from exhaust, and 3.46 tons of PM₁₀/PM_{2.5} annually during training exercises. The numbers and types of helicopters used by the medium CAB, annual training hours, landing and takeoff cycles, and emissions estimates are given in **Appendix E**. Annual emissions of most pollutants associated with vehicle and helicopter training combined are approximately 9 percent greater than under Alternative 3, and 10 to 13 percent greater than under Alternative 2. In the case of CO, emissions under Alternative 4 are 18 percent greater than those under Alternative 3 and 22 percent greater than those under Alternative 2.

Increased fuel storage and transfer associated with military vehicles would generate approximately 1.58 tons of VOCs annually, which would be greater than the amount under the other alternatives, but still minor. Emissions associated with generator usage would be about double those under Alternative 3, at approximately 10.50 tons of CO, 48.72 tons of NO₂, 3.88 tons of VOCs, 3.22 tons of SO₂, 3.46 tons of PM₁₀, and 3.46 tons of PM_{2.5} annually.

Under Alternative 4, there would be a greater potential for hazardous air pollutants to be released on YTC than under the other alternatives. All fuel storage and transfer activities and vehicle maintenance activities would follow air quality compliance procedures that meet NESHAPs, and significant effects to air quality would not be expected to occur.

6.7.9.4 *Conformity Analysis*

Based on total new emissions occurring under Alternative 4, emissions of CO and PM₁₀ would exceed the conformity threshold and trigger a conformity determination. To determine whether the proposed actions under Alternative 4 would cause a violation of the NAAQS, dispersion modeling was performed for emissions of CO and PM₁₀. The results of this modeling are presented in **Table 6-21**. These results indicate that the predicted emissions of CO and PM₁₀ are less than the NAAQS, and the proposed actions under Alternative 4 would not cause a violation of the NAAQS. YTC would prepare a FONSI to the General Conformity Rule under this alternative. The projected increase in PM of 3,204 tons per year, most of which would originate outside the PM maintenance area, would not constitute a significant adverse effect to air quality. Additionally, the projected increase in CO of 110.9 tons per year, originating outside of the CO maintenance area, would not constitute a significant adverse effect to air quality.

6.7.10 Cumulative Effects

6.7.10.1 *Less than Significant Effects*

Cumulative effects would be less than significant. Cumulative impacts to air quality would be associated with ongoing Army activities (including continued and increased training), as well as other emission sources in the region, such as car emissions and wood burning. Various regional efforts to reduce air emissions and improve air quality would continue to help offset cumulative impacts and protect air quality.

Table 6-21 Air Pollutant Concentrations Modeled at the YTC Installation Boundary (Including Monitored Background) under Alternative 4

Training Area	Pollutant Concentrations ($\mu\text{g}/\text{m}^3$) ¹			
	1-hr CO	8-hr CO	24-hr PM ₁₀	Annual PM ₁₀
TA1	5.11	0.89	2.15	N/A
TA2	1.90	0.35	0.89	N/A
TA3	3.05	0.56	1.13	N/A
TA4	1.28	0.24	0.59	N/A
TA5	4.24	0.83	1.70	N/A
TA6	5.98	0.96	2.64	N/A
TA7	5.73	0.92	1.89	N/A
TA8	5.54	0.93	2.13	N/A
TA9	6.99	10.76	2.62	N/A
TA10	9.93	2.00	5.35	N/A
TA11	7.86	1.61	4.51	N/A
TA12	6.40	1.74	4.84	N/A
TA13	85.17	21.08	48.66	N/A
TA14	18.77	5.40	13.08	N/A
TA15	6.09	1.30	3.13	N/A
TA16	2.96	0.54	1.43	N/A
AA1	43.63	13.76	43.76	N/A
AA2	70.68	16.86	43.11	N/A
AA3	35.53	8.59	18.84	N/A
SDZ	11.63	2.43	5.85	N/A
MPRC	4.59	1.08	1.77	N/A
MPTR	7.29	1.36	2.79	N/A
All Training Areas	N/A	N/A	N/A	0.60
Maximum Modeled Concentration	85.17	21.08	48.66	0.60
Monitored Background	5,057.47	3,563.22	52	22
Total Impact	5,142.64	3,584.30	100.66	22.60
NAAQS	40,000	10,000	150	50

Note:

1. Includes Monitored Background, which refers to background concentrations of pollutants from natural sources, nearby sources, and unidentified sources. Source of background air data is EPA 2007.

In the Columbia Basin, development, population increases, and agriculture have contributed to air quality emissions. As a result of the cumulative emissions from numerous activities, particulate matter and CO have become pollutants of concern in the region. Wood stoves, wind erosion, off-road vehicles (including military training at YTC), and agricultural activities have all contributed to particulate matter in the air, with smoke from wood burning during winter the biggest contributor. Car emissions and winter wood smoke have been the primary regional source of CO emissions.

The proposed action and other actions and activities in the area of YTC would result in increases in air pollutant emissions within the region. Current, proposed, and future training would result in an increase in the number of Army vehicles utilized at YTC. There would be increased exhaust emissions from aircraft and ground vehicles, and in the case of vehicles used for maneuver training, increased dust emissions. Training on YTC takes place in remote areas, where winds predominantly transport air emissions away from more polluted areas in the Yakima Valley. On a regional scale, the population in the YTC ROI has increased over time and will likely continue to do so. Development in the region also continues to increase. As a result, emissions associated with personal vehicles,

residences, and industry continue to increase. Army actions would be expected to contribute to cumulative impacts to air quality in the region. Continuing to follow fire management programs would help to minimize the amount of PM₁₀ generated by Army activities on YTC. Additionally, YTC's Master Dust Control Plan helps to minimize emissions in the form of dust.

Off-Post, continued improvements in vehicle fuel efficiency and pollution control, upgrading of construction standards for housing and industrial development to reduce energy use, better pollution control equipment and technology, and enforcement of pollution control regulations for industry should help to reduce air emissions regionally. Population growth in the Yakima Valley and portions of the Interior Columbia River Basin has lagged behind growth rates in other parts of Washington, helping to keep the amount of new air emissions low relative to other portions of the state. Control measures instituted by the YRCAA (such as burn permits, burn bans, and compliance patrols) have helped improve air quality in the region and maintain air quality standards.

Based on current scientific research, there is growing concern about the potential effects of primary greenhouse gases (CO₂, methane, NO_x, ozone, water vapor, and chlorofluorocarbons) on global climate. Through many complex interactions on regional and global scales, the lower layers of the atmosphere experience a net warming effect. These trends could be caused by greenhouse warming or natural fluctuations in the climate. Information relevant to the specific impacts of Army projects, including the proposed actions, on the global climate is not known. The state of science pertaining to GHG is developing and it is not currently possible to predict at what levels emissions impact climate change. Consequently, conclusive scientific findings that would aide decision-makers are not possible at this time (40 CFR 1502.22).

Activities on YTC and regionally would produce some of the listed greenhouse gases, primarily as a result of power requirements and fuel consumption (activities that produce CO). The incremental contribution of greenhouse gases from ongoing training, however, would be negligible when compared to total greenhouse gas contributions. Efforts by YTC and regionally to reduce fossil fuel use and reduce emissions would help to ensure that cumulative impacts to air quality and global warming from activities on YTC and in the region be less than significant.

6.7.11 Mitigation

Currently, YTC implements a variety of BMPs to mitigate the effects of the Army's activities on air quality. These BMPs include implementing the limits on air emissions and quantities of smoke producing devices identified in previous environmental impact analyses, revegetating degraded areas to reduce dust production, implementing dust control plans during demolition and construction activities, and reviewing air operating permit prior to any new construction (**Table 6-33**). In addition to the BMPs, YTC proposes to implement appropriate site rehabilitation following all construction related projects to provide the appropriate vegetative community or landscaping to protect air resources (**Table 6-34**).

6.7.12 Conclusions

Air emissions would be generated by personnel at YTC, by construction activities, and from military training activities. As these increase, the amount of pollutants generated increases. As shown above, total projected CO and PM₁₀ emissions from activities that would occur under the alternatives would exceed levels that trigger a conformity analysis. Dispersion modeling was conducted to determine the air quality impacts in the maintenance area. The proposed activities under all of the alternatives would not cause a violation of the NAAQS and do not violate the General Conformity Rule.

6.8.3.2 *Live-fire Training Direct and Indirect Effects*

6.8.3.2.1 *Less than Significant Effects*

Training ranges and facilities necessary to support SBCTs are detailed in **Chapter 2**. Both small and large caliber weapons would be operated. Under Alternative 1, three SBCTs would be stationed at Fort Lewis, but only two SBCTs would likely train at YTC at any one time because of deployments.

Impacts from small caliber weapons are shown on **Figure 5–9**. Baseline impacts to Zone II exceed the southwestern boundary and impact a small portion of YTC. The Zone II (PK15[met] 87 dB) contour extends less than 3,937 feet (1,200 m) beyond the installation boundary and, because the software cannot account for any reflection or absorption as a result of the terrain, the actual levels extending beyond the installation boundary may be less than 87 dB PK15(met). Because the contours are based on peak levels rather than a cumulative or average level, the size of the contours would not change if the number of rounds fired increases. This impact would be less than significant. Baseline impacts from large caliber weapons are shown on **Figure 5–7**. There is no impact to the cantonment area. The LUPZ extends west of the boundary by 5,300 meters, and Zone II extends 4,265 feet (1,300 m). The LUPZ also extends beyond the southwestern boundary. These off-boundary areas are sparsely populated or unpopulated and have compatible land uses. The LUPZ extends beyond the southern boundary by 3,281 feet (1,000 m), Zone II extends approximately 1,640 feet (500 m), and Zone III extends 160 feet (50 m). This off-boundary area is zoned agricultural, is sparsely populated, and is compatible with the land use. Because this does not create a land use compatibility problem, this impact would continue to be less than significant.

Baseline impacts from VAH are shown in **Figure 5–8**. The LUPZ and Zone II noise contours do not extend beyond the boundary or near existing structures. The low number of operations does not produce a Zone III noise contour. The impact from the VAH would continue to be less than significant.

Complaint risk impacts are described in **Section 5.8**. Baseline and forecast impacts are the same because the size of the contours does not change if the number of rounds increases. The moderate (115 dB PK15 [met]) and high (130 dB PK15 [met]) complaint risk noise contours do not extend into the YTC cantonment area. The probability of receiving noise complaints in the cantonment area would be low.

The moderate and high complaint risk noise contours do extend beyond the facility boundary. However, the actual risk of complaints may be low, as these areas are primarily mountainous or agricultural and either sparsely populated or unpopulated. Additionally, in the past 9 years, there have been noise-related inquiries, but there have been no recorded noise complaints at YTC (USACHPPM 2008b). Baseline noise contours at YTC show there are currently few residences exposed to high noise levels (USACHPPM 2008a). The lack of impact is primarily due to YTC's remote location and mountainous terrain surrounding YTC. The significance criteria would not be exceeded for live-fire training; therefore, under Alternative 1, overall impacts to noise from the live-fire training would be less than significant.

6.8.3.3 *Maneuver Training Direct and Indirect Effects*

6.8.3.3.1 *Less than Significant Effects*

Larger unit training at the battalion and brigade levels would typically occur at YTC, and this training often incorporates company-level training. One or two SBCTs have been training at YTC since the Army fielded the first SBCT at Fort Lewis. Maneuver training can sometimes involve firing while some maneuver training just involves driving. Other maneuver training, such as convoy

live-fire, involves firing while on the move. Strykers are quieter than tracked vehicles. Therefore, impacts from maneuver training would be less than impacts from live-fire training. The significance criteria would not be exceeded for maneuver training; therefore, under Alternative 1, impacts to noise from maneuver training would be less than significant.

6.8.4 Alternative 2 — GTA Actions

6.8.4.1 Construction Direct and Indirect Effects

6.8.4.1.1 Less than Significant Effects

Two range construction projects are planned at YTC under Alternative 2. Impacts from construction would be short-term and less than significant because the significance criteria would not be exceeded.

6.8.4.2 Live-fire Training Direct and Indirect Effects

6.8.4.2.1 Less than Significant Effects

Training ranges and facilities necessary to support a SBCT are detailed in **Table 2-7**. Both small and large caliber weapons would be operated. Under Alternative 2, three SBCTs would train at YTC annually. As noted above, noise impacts from Alternative 2 were not specifically modeled, but instead are compared to the modeled results for Alternative 4, discussed below. Impacts to noise from Alternative 2 would be similar to impacts described under Alternative 4, and would be less than significant. However, because Alternative 2 does not include a medium CAB, the noise impacts would be less than impacts from Alternative 4.

6.8.4.3 Maneuver Training Direct and Indirect Effects

6.8.4.3.1 Less than Significant Effects

Larger unit training at the battalion and brigade levels would typically occur at YTC, and this training often incorporates company-level training. One or two SBCTs have been training at YTC since the Army fielded the first SBCT at Fort Lewis. Some maneuver training involves firing, some involves only driving, and some (such as convoy live-fire) involves firing while on the move. Strykers are quieter than tracked vehicles. Therefore, impacts from maneuver training would be less than impacts from live-fire training. The significance criteria would not be exceeded for maneuver training; therefore, under Alternative 2, impacts to noise from maneuver training would be less than significant.

6.8.5 Alternative 3 — GTA Actions + CSS Soldiers

6.8.5.1 Construction Direct and Indirect Effects

6.8.5.1.1 Less than Significant Effects

Under Alternative 3, both of the range projects identified for Alternative 2 would be constructed; no additional construction would occur. As described for Alternative 2, effects from the construction would be less than significant because the significance criteria would not be exceeded.

6.8.5.2 Live-fire Training Direct and Indirect Effects

6.8.5.2.1 Less than Significant Effects

Because the addition of CSS Soldiers does not significantly impact noise from live-fire training, impacts to noise from Alternative 3 would be similar to those described for Alternative 2, and would be less than significant.

6.8.5.3 *Maneuver Training Direct and Indirect Effects*

6.8.5.3.1 *Less than Significant Effects*

Because the addition of CSS Soldiers does not significantly impact noise from maneuver training, impacts to noise from Alternative 3 would be similar to those described for Alternative 2, and would be less than significant.

6.8.6 **Alternative 4 — GTA Actions + CSS Soldiers + Medium CAB**

6.8.6.1 *Construction Direct and Indirect Effects*

6.8.6.1.1 *Less than Significant Effects*

Under Alternative 4, both of the range projects identified for Alternative 2 would be constructed; no additional construction would occur. As described for Alternative 2, effects from construction would be less than significant because the significance criteria would not be exceeded.

6.8.6.2 *Live-fire Training Direct and Indirect Effects*

6.8.6.2.1 *Less than Significant Effects*

6.8.6.2.1.1 Demolition and Large Caliber Weapons

Figure 6-3 contains the forecast contours for demolition and large caliber weapons. The forecast contours represent the existing operations and the proposed activity. Due to the small increase in activity, the forecast contours are almost identical to the baseline condition noise contours. The exception is well inside of the installation boundary, near the air-to-ground range and CIA. Because this does not create a land use compatibility problem, this impact would be less than significant.

6.8.6.2.1.1 Small Caliber Weapons Noise Contour Modeling Results

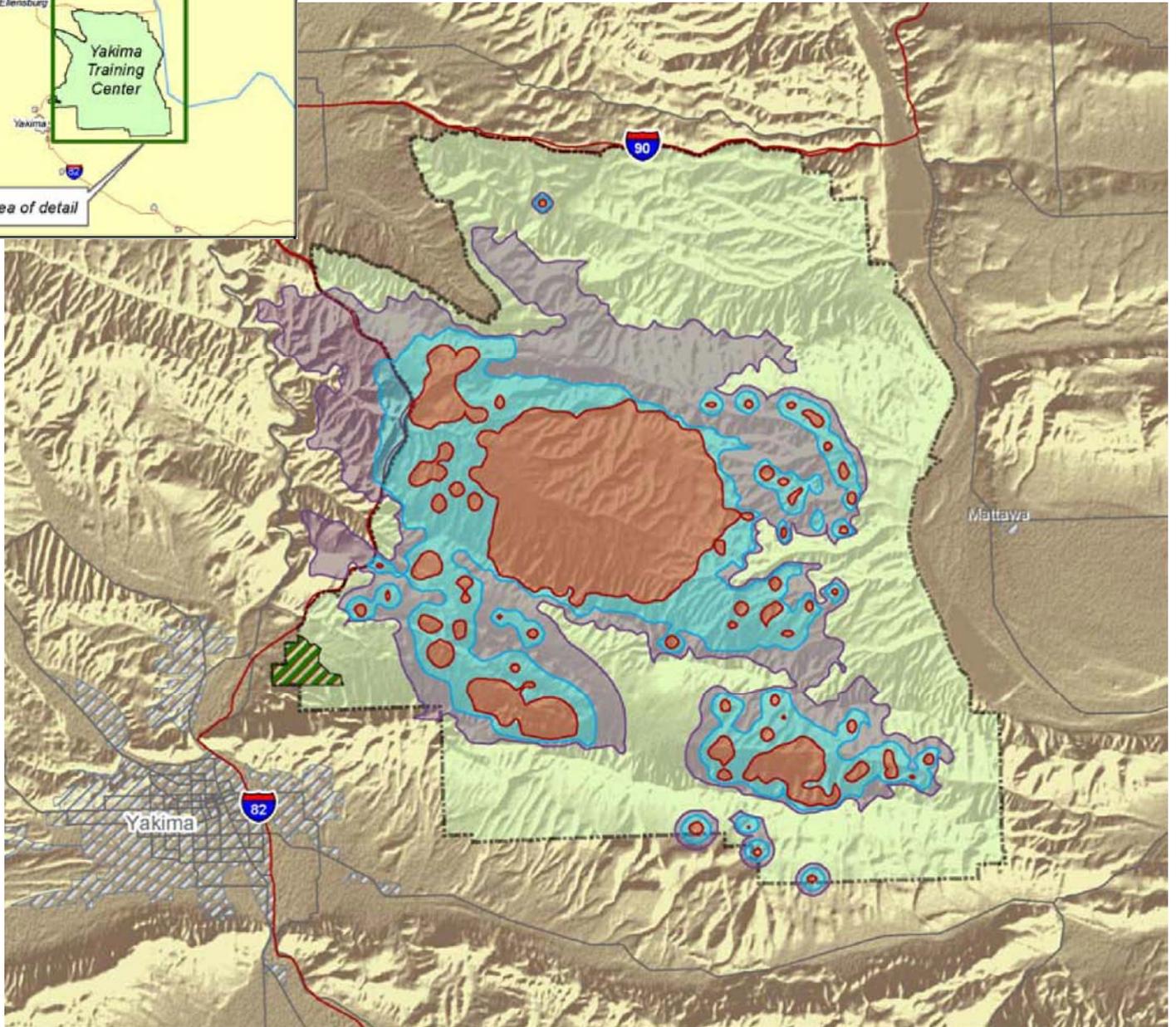
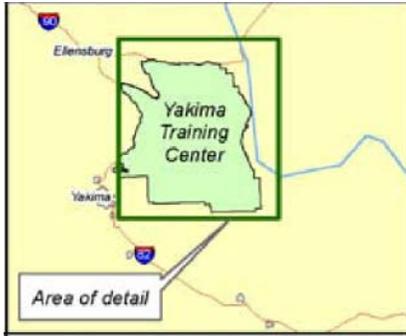
The contours for small arms operations at YTC were created using PK15(met) as prescribed in AR 200-1. The contours show the predicted peak levels for individual rounds (metric term is PK15[met]). Because the contours are based on peak levels rather than a cumulative or average level, the size of the contours would not change if the number of rounds fired increases. The results for forecast contours are the same as the baseline shown in **Figure 5-7**. This impact would be less than significant.

6.8.6.2.1.2 Vagabond Army Heliport

The noise contours for the forecasted operations are shown in **Figure 6-4**. The additional airfield activity reflects the possibility of fielding a medium CAB. The LUPZ (60 ADNL) extends beyond the western boundary approximately 2 miles (3 km). The land is zoned agricultural and/or remote with limited development potential and, as such, the land use is compatible. However, there is the potential for aircraft to cause annoyance while entering/existing the airspace, as this area is sparsely populated. The Zone II (65 ADNL) and Zone III (75 ADNL) noise contours do not extend beyond the installation boundary. This impact would be less than significant.

6.8.6.2.1.1 Flight Corridors

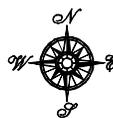
Based on modeling results, a buffer area of one-third mile was added to each side of the corridor. This gives an adequate buffer to reduce possible annoyance. The YTC flight corridor generally follows the installation boundary, avoiding areas that are off-limits to aviation or that have altitude restrictions. The majority of the flight track centerline is approximately 700 feet (200 m) from the boundary. The aircraft utilizing the flight corridor are the AH-64, CH-47, OH-58D, and the UH-60.



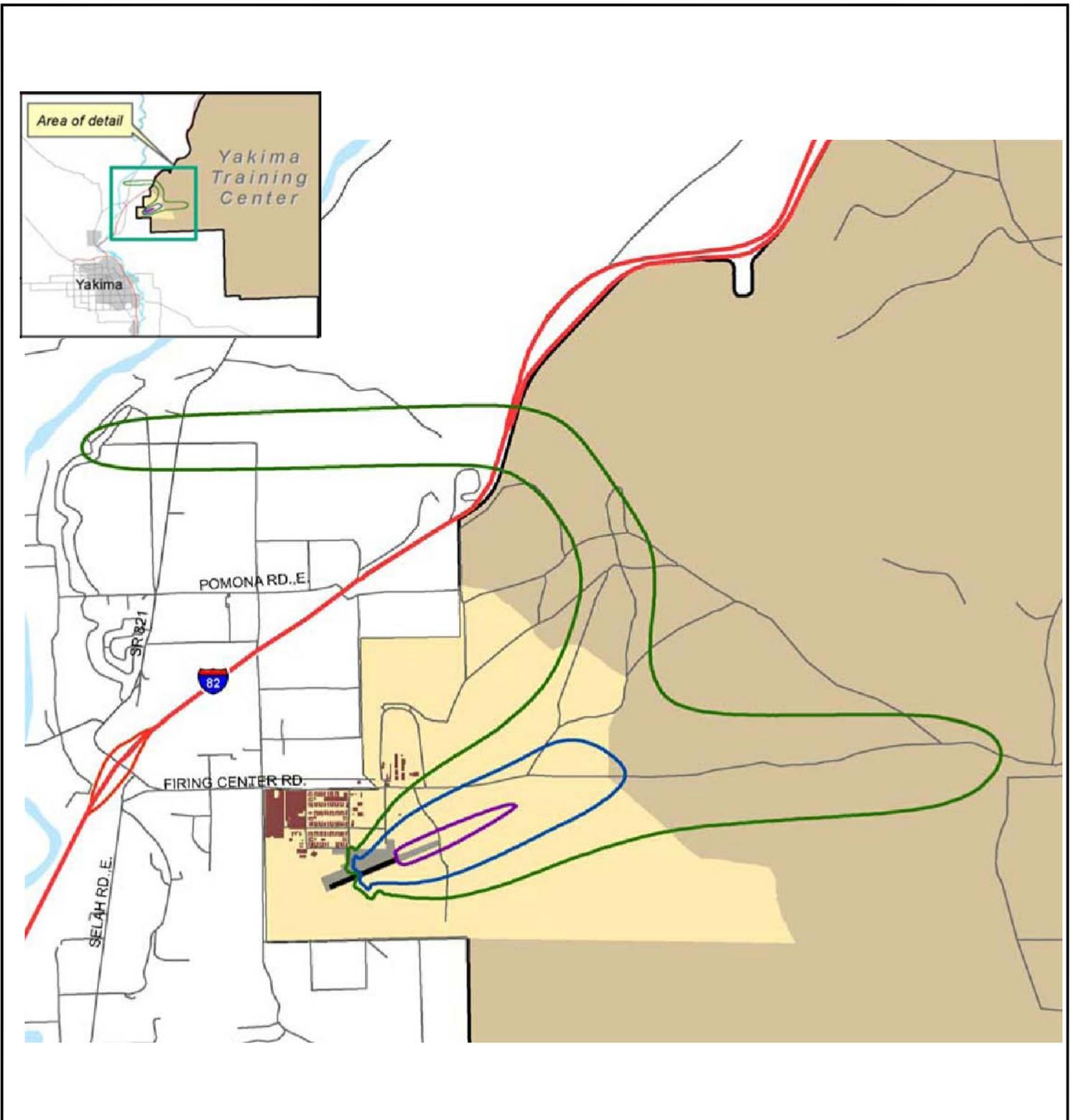
Source: USACHPPM 2008a

Legend

-  115 dB PK15
-  130 dB PK15
-  Cantonment Area
-  Yakima Training Center
-  Interstate Highway



FORT LEWIS GTA EIS	
<i>Figure 6-3 Yakima Training Center Forecast Conditions Demolition and Large Caliber Operational Noise Contours</i>	
ANALYSIS AREA: Thurston & Pierce Counties, Washington	
Date: 7/14/2009	File: Ft. Lewis Figures.dwg
Prepared By: ETC	Layout: 018

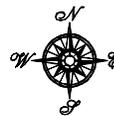


Source: USACHPPM 2008a

Legend

- Existing Structures
- Vagabond Army Heliport
- Cantonment Area
- Yakima Training Center
- LUPZ (60 dB ADNL)
- Zone II (65 dB ADNL)
- Zone III (75 dB ADNL)

* Forecast condition noise contours include the baseline activity and the proposed Heavy Combat Aviation Brigade.



FORT LEWIS GTA EIS

*Figure 6-4
Yakima Training Center Forecast Conditions
Vagabond Army Heliport Operational
Noise Contours*

ANALYSIS AREA: Thurston & Pierce Counties, Washington	
Date: 7/14/2009	File: Ft. Lewis Figures.dwg
Prepared By: ETC	Layout: 019

There may be multiple aircraft or multiple types of aircraft in the corridor at one time. Because the buffers are based on maximum levels, the number of aircraft in the corridor at one time does not affect the size of the annoyance potential buffer.

The supplemental buffer width is based upon achieving maximum values of 70 dBA and/or a 5 percent complaint risk or more at the receiver. One-third mile is added to the flight corridor width for the loudest aircraft (AH-64 and CH-47) using the flight corridor to account for annoyance created by activity taking place at the edge of the flight corridors. The supplemental buffers cannot account for any terrain features. The supplemental annoyance buffer would extend slightly beyond the western installation boundary and beyond the eastern boundary (**Figure 6-5**). The majority of the area is unpopulated; therefore, the risk of annoyance is low. This impact would be less than significant.

6.8.6.2.1.1 Complaint Risk

To predict the risk of complaints for demolition and large caliber weapon operations, PK15(met) contours were developed. The baseline and forecast complaint risk contours are identical because the type of weapon and ranges utilized are the same. The complaint risk contours are based on peak levels rather than a cumulative or average level. Therefore, the size of the contours would not change if the number of rounds fired increases. The large caliber weapons complaint risk noise contours are shown in **Figure 5-10**.

The moderate and high complaint risk noise contours do not extend into the YTC cantonment area. Consequently, the probability of receiving noise complaints in the cantonment area would be low.

The moderate and high risk of complaint contours extend beyond the western and southern boundaries, and the moderate risk of complaint contour extends beyond the southwestern boundary. The complaint risk guidelines would indicate a moderate to high probability of receiving noise complaints from demolition and large caliber activity at YTC. However, the actual risk of complaints may be low, as these areas are primarily mountainous or agricultural, and are either sparsely populated or unpopulated. In the past 9 years, there have been noise-related inquiries beyond the southern boundary, but there have been no recorded noise complaints at YTC (USACHPPM 2008b).

Forecast noise contours at YTC suggest that few residences are currently exposed to high noise levels (USACHPPM 2008a). The lack of impact is primarily due to YTC's remote location and the surrounding mountainous terrain. The significance criteria would not be exceeded for live-fire training; therefore, overall impacts to noise from live-fire training would be less than significant under Alternative 4.

6.8.6.3 *Maneuver Training Direct and Indirect Effects*

6.8.6.3.1 *Less than Significant Effects*

Some maneuver training involves firing, some involves only driving, and some (such as convoy live-fire) involves firing while on the move. Strykers are quieter than tracked vehicles. Therefore, impacts from maneuver training would be less than impacts from live-fire training. The significance criteria would not be exceeded for maneuver training; therefore, maneuver training noise impacts would be less than significant.

6.8.7 Cumulative Effects

6.8.7.1 *Less than Significant Effects*

While there would be additive noise impacts from the alternatives in conjunction with other noise-generating activities and actions at YTC and in the region, cumulatively, these effects would be less than significant. The principle activities within the region that contribute to noise are those mission activities occurring at YTC, including training by visiting units. Other sources contributing to noise are Yakima Municipal Airport; Bowers Field; and traffic noise from I-82, I-90, SR 2, SR 12, and SR 97. Projects considered in the cumulative impacts analysis are continued HIMARS launching and one project (DIGITAL MPRC, listed in **Appendix B**), that has already been analyzed under NEPA. The DIGITAL MPRC would contribute to cumulative construction-related noise impacts.

Under the HIMARS program, up to 432 rockets are fired annually with 54 rockets launched during each battalion exercise. An exercise lasts 1 to 5 days. Impacts to noise from HIMARS would be expected to be similar to those associated with larger arms and demolitions where the 115 PK15(met) contour does not impact the cantonment area and extends beyond the western, southwestern, and southern boundaries. While HIMARS would add to noise impacts, cumulative noise impacts would be less than significant.

6.8.8 Mitigation

Currently, YTC implements a variety of BMPs to mitigate the noise effects of the Army's activities. These BMPs include implanting the noise control plan from the EPP required for construction projects 1 or more acres in size and implementing the Installation Operational Noise Management Plan (**Table 6-33**). The analysis of the direct, indirect, and cumulative effects for the four alternatives concludes that the effects are less than significant. Therefore, no new or additional mitigation is necessary to avoid, limit, repair, reduce, or compensate for the adverse effects.

6.9 LAND USE CONFLICT/COMPATIBILITY

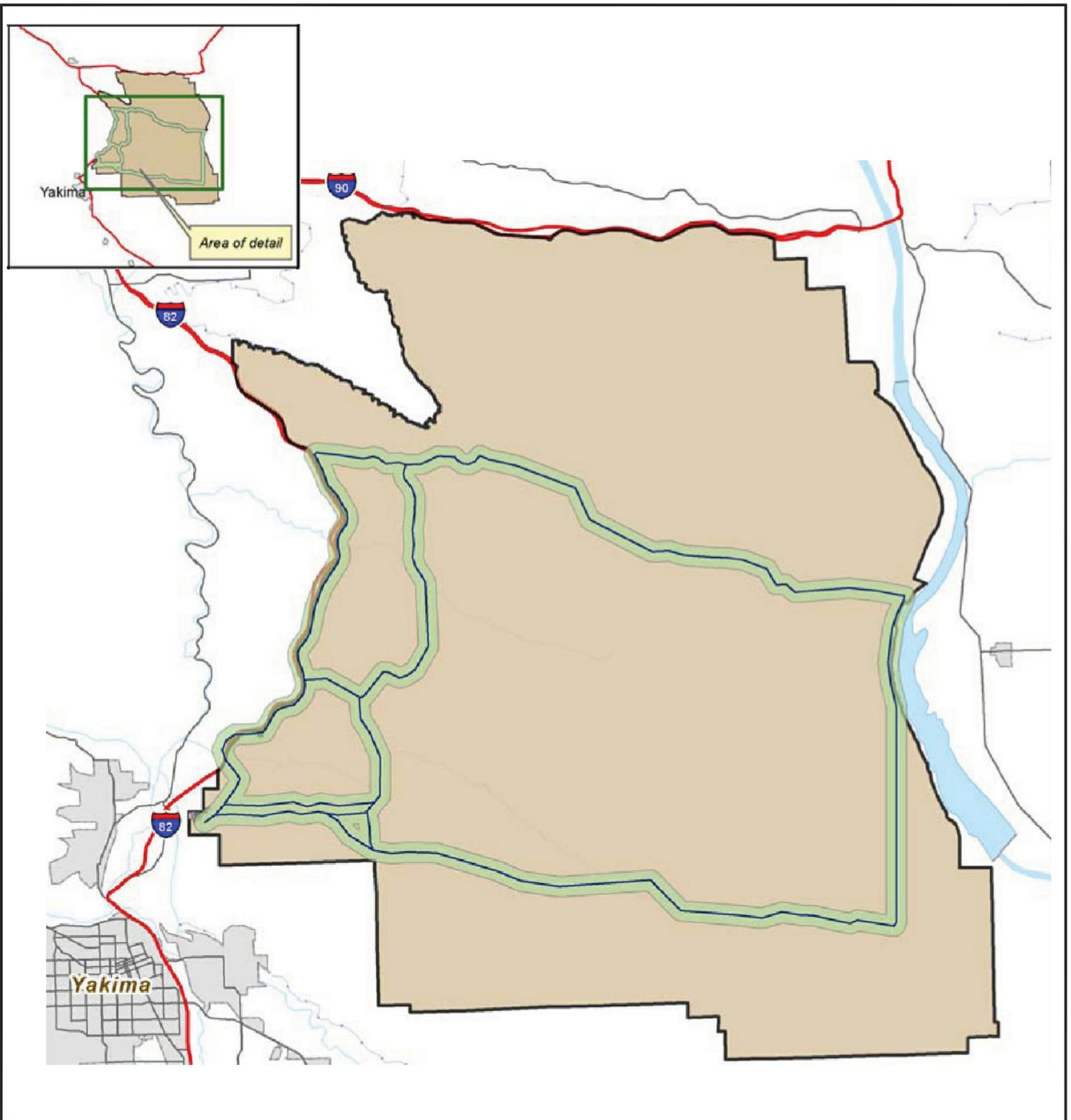
Impacts to land uses and recreation resources were assessed based on whether the proposed project activities would be compatible with existing or planned land uses in the ROI for each project alternative. Impacts on recreation resources were assessed by determining the types of land and recreational uses in and around the project activities and then evaluating their sensitivity to the short- and long-term project effects. Localized and temporary impacts on land use during construction are also evaluated, as well as training changes to land that is currently used for training. Also considered was the consistency of the proposed project activities with the objectives and policies of the pertinent federal, state, and local land use and recreation plans.

Direct impacts to land uses occur from changes to existing land use designations or conflicts with existing or planned land uses. Indirect impacts to land uses occur from encroachment issues to neighboring land uses from proposed activities. Indirect impacts would include effects from noise, dust, and construction-related traffic.

The following issues related to land use conflict/compatibility at YTC were identified through public scoping. These issues are addressed in the following sections for each alternative.

- Temporary and permanent land use effects from implementing GTA actions.

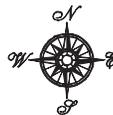
The effects of increased military usage of YTC on deer and elk hunting.



Source: USACHPPM 2008a

Legend

-  Flight Corridor Centerline
-  Supplemental Annoyance Buffer (1/3 Mile)
-  Yakima Training Center
-  Interstate Highway



FORT LEWIS GTA EIS

*Figure 6-5
Yakima Training Center Corridor
Annoyance Buffer*

ANALYSIS AREA: Thurston & Pierce Counties, Washington	
Date: 7/14/2009	File: Ft. Lewis Figures.dwg
Prepared By: ETC	Layout: 020

6.9.1 Resource-specific Significance Criteria

Impacts on land use in general and on training areas in particular at YTC resulting from implementation of the proposed action and its alternatives would be considered significant if the action is:

- Incompatible with existing military land uses/land use designation on the installation, or conflicts with Army land use plans, policies, or regulations (specifically including AR 350-19, The Army Sustainable Range Program); or
- Incompatible with non-military land uses on the installation, including recreational use or tribal access, or the action would conflict with non-military land use plans or policies.

6.9.2 Overview of Impacts to Land Use Conflict/Compatibility by Alternative

Table 6-23 summarizes the potential impacts to land use, including military and non-military uses, such as recreation, to YTC resources that would occur under each of the alternatives.

Table 6-23 Summary of Potential Effects to Land Use at YTC

Activity Group	Alt 1	Alt 2	Alt 3	Alt 4
Construction Direct and Indirect Effects	•	€	€	€
Live-fire Training Direct and Indirect Effects	€	€	€	€
Maneuver Training Direct and Indirect Effects	€	€	€	€
Cumulative Effects	€	€	€	€

U = Significant Effects

W = Significant but Mitigable to less than Significant Effects

€ = Less than Significant Effects

+ = Beneficial Effect

N/A = Not Applicable

• = No Effects

6.9.3 Alternative 1 — No Action Alternative

6.9.3.1 Construction Direct and Indirect Effects

6.9.3.1.1 No Effects

While no construction projects are proposed, current range maintenance would continue as needed. This would include berm, trail, and targetry maintenance and would temporarily restrict access to certain range sites. Maintenance of range areas could potentially limit access to those areas during maintenance activities. There would be no direct and indirect impacts from construction activities to existing and planned land uses, including non-military uses, at YTC under Alternative 1.

6.9.3.2 Live-fire Training Direct and Indirect Effects

6.9.3.2.1 Less than Significant Effects

Direct and indirect effects from live-fire training, which is one of the primary factors contributing to indirect effects on surrounding land uses, would continue under current levels of use. Under current levels of use, there are no changes to land uses or conflicts with existing land use, as live-fire training is the primary existing land use of live-fire ranges and impact areas. Indirect impacts from continued live-fire activities would include effects from noise, dust, and training-related traffic. These indirect effects to land use activities in neighboring areas would continue at current levels because the number of required live-fire user days per year at YTC would be near current levels under Alternative 1. Implementation of YTC's administrative management programs and associated

land management practices would continue. Consequently, there would be no additional direct and indirect impacts to military and non-military land uses from Alternative 1, and impacts would remain less than significant.

6.9.3.3 *Maneuver Training Direct and Indirect Effects*

6.9.3.3.1 *Less than Significant Effects*

Direct and indirect effects from maneuver training intensity and frequency at YTC would remain at current levels. Implementation of YTC's administrative management programs and associated land management practices would continue. Continuing noise, dust, or other indirect effects outside the installation boundaries could preclude locating residences or other sensitive receptors in these areas in the future. These effects would continue under Alternative 1; however, no additional impacts are anticipated, and impacts would remain less than significant.

6.9.4 Alternative 2 — GTA Actions

6.9.4.1 *Construction Direct and Indirect Effects*

6.9.4.1.1 *Less than Significant Effects*

No projects involving construction, or any other activity with the potential to affect existing land uses in the cantonment area, are proposed under Alternative 2. Therefore, no impacts to existing land use designations within the cantonment area are anticipated, and Alternative 2 would not conflict with the YTC Master Plan update.

The two range/training infrastructure projects proposed under Alternative 2 would be located within existing range/training areas at YTC and would support live-fire training. Construction of range projects would indirectly affect nearby land uses because of increased noise, dust, odors, construction-related traffic, adverse effects on views from public areas, and human presence and activity in the construction sites. The SFF would be a new live-fire range in TAA 1. Live fire would be a new military use of TAA 1; however, the primary objective of meeting military mission goals would be met. Effects to current military and non-military land uses are anticipated to be less than significant. The MPMG would be located in Range 5. This range project would not constitute a change in the land use or conflict with existing land uses, as the current military training use of Range 5 includes live-fire training.

During construction on Range 5, UXO could be encountered. Potential impacts associated with the presence of UXO and mitigation by implementation of Army SOPs are evaluated in greater detail in **Section 5.12**. UXO cleanup and the evacuation of structures, if necessary, would be a temporary disruption of training activities and other land uses, such as recreation and tribal uses of resources. Live-fire activities do not currently take place on TAA 1; therefore, UXO would likely not be encountered during construction.

Direct and indirect impacts to military and non-military land uses from range construction under Alternative 2 would be less than significant. There would be no change to existing land uses, and disruptions of existing military and non-military land uses from construction activities would be temporary.

6.9.4.2 Live-fire Training Direct and Indirect Effects

6.9.4.2.1 Less than Significant Effects

Under Alternative 2, training would increase at all ranges on YTC, and would increase both the number of rounds fired and vehicular traffic to and from training areas. Increased noise, dust, or other indirect effects associated with this alternative are not expected to affect off-Post land uses. The areas surrounding live-fire training areas are uninhabited lands within the installation. No residential areas, schools, hospitals, or businesses are expected to be affected. These impacts would be localized to the vicinity around the ranges. The nearest inhabited area is the cantonment area to the southwest of TAA 1.

Recreational and tribal access to authorized activities related to cultural and natural resources in Range 5 would not be affected by Alternative 2, as access to this impact area is currently and would continue to be restricted. The SFF would be a new live-fire range in TAA 1, and this area is not currently used for live-fire training. Under Alternative 2, use of this area for live-fire training would close the range to recreational and tribal uses. While this would be a change in the land use, it is not considered a significant change because the primary land use is military training, and this area is located within an existing range on YTC. In addition, sufficient dispersed recreation opportunities exist on other YTC training areas. No developed recreation areas occur in TAA 1, and none would be affected from this change in use.

Outdoor recreation activities in impact areas contaminated with UXO are prohibited. Therefore, no change to current opportunities and levels of recreational uses are expected from UXO from increased training within the training areas.

Training areas adjoining live-fire training areas would be affected by increased live-fire training. Increased use of live-fire ranges would increase the frequency of activation of SDZs, which could cause an adjoining maneuver area to be unavailable for training. Implementation of Alternative 2 would increase the potential for training conflicts. There would also be decreased recreation opportunities and tribal access for those adjoining maneuver areas affected by the activation of SDZs; however, these opportunities exist on other training areas at YTC. Impacts to adjoining training areas from increased use of SDZs would be less than significant because of the continued implementation of scheduling, regulatory, and administrative measures as described in the CNRMP/INRMP. Strict adherence to applicable regulations and procedures would continue to reduce or remove potential hazards to recreation uses and tribal access. Effects to these non-military uses would be less than significant.

6.9.4.3 Maneuver Training Direct and Indirect Effects

6.9.4.3.1 Less than Significant Effects

Existing maneuver training areas at YTC are expected to accommodate the 50 percent increase in the amount of maneuver training under Alternative 2. YTC is anticipated to support most large maneuver training at the company and battalion levels and above. There would be no change to existing land uses from this increased training; however, there would be an increased frequency and intensity of use, which could conflict with desired land conditions in training areas. These effects could include the degradation of soils and vegetation cover, which would physically degrade land conditions over time and make conditions unsafe and less desirable for training, thus impeding the ability to support the primary land use of supporting military mission goals.

Current management and monitoring objectives focus on rehabilitating training damage and support ITAM's goals to revegetate disturbed areas and stabilize soils that have been impacted through training activities. Continued implementation of these objectives would minimize conflicts with land use management plans or policies and reduce impacts to less than significant. An increase in the frequency of maneuver training would affect non-military land uses of recreation and access by tribes to cultural and natural resources. Currently, training areas are open to recreational and tribal uses when there is no scheduled maneuver training. However, an increase in the number of Soldiers training would increase the number of operating hours for maneuver training. The opportunities for access to training areas would be reduced for dispersed recreational uses, such as hunting. Land uses are managed through multiple programs. Regulatory and administrative measures are described in the CNRMP/INRMP, which incorporates information and guidance presented in numerous planning documents and programs. On YTC, those land uses that do not meet the military mission either are prohibited in specific areas or must be scheduled for time periods that will not conflict with military training activities. Continued implementation of these scheduling and administrative measures with ongoing training would reduce impacts to recreation and tribal uses to less than significant.

Under Alternative 2, military activities, training, and restriction areas would be confined within the YTC maneuver training area boundaries and would not affect off-Post land uses. To accommodate expanded missions, and concurrently minimize encroachment from or upon the installation, YTC should continue to update management prescriptions in various land use planning and management programs to address greater levels of training uses. Adverse effects to military and non-military land uses from changes in land uses or from increased frequency and intensity of training are mitigated by specific requirements to protect soils, vegetation, riparian areas, and wetland resources that are presented in the appropriate resource sections of this analysis. The continued development of the GIS program and incorporation of the program into existing land management programs would increase the effectiveness of efforts to implement specific resource mitigation and monitoring requirements by reducing conflicts and redundancy among various programs.

6.9.5 Alternative 3 — GTA Actions + CSS Soldiers

6.9.5.1 Construction Direct and Indirect Effects

6.9.5.1.1 Less than Significant Effects

There would be no construction projects implemented under Alternative 3 in addition to those that would occur under Alternative 2. Impacts on land uses during construction are described under Alternative 2, and would be temporary and less than significant.

6.9.5.2 Live-fire Training Direct and Indirect Effects

6.9.5.2.1 Less than Significant Effects

Under Alternative 3, increased live-fire training would occur because of CSS Soldiers training at YTC in addition to GTA unit changes and a third SBCT under Alternative 2. Impacts on land use at and surrounding YTC would be very similar under Alternative 3 to those described under Alternative 2. The minor increase in live-fire training under Alternative 3 over Alternative 2 levels would not result in additional impacts to land use beyond those described for Alternative 2.

6.9.5.3 Maneuver Training Direct and Indirect Effects

6.9.5.3.1 Less than Significant Effects

The increases in maneuver training from the addition of CSS Soldiers are expected to be small. There would be no change to existing land uses; however, there would be an increased frequency and intensity of use for maneuver training activities, which could conflict with desired land conditions in training areas. The effects include the physical degradation of soils and vegetation cover as described for Alternative 2, but would occur to a greater level under Alternative 3 due to the increase in Soldiers training. Continued implementation of current management and monitoring objectives that focus on rehabilitating training damage would minimize conflicts with land use management plans or policies and reduce impacts to less than significant.

An increase in the frequency of maneuver training would also increase the effects on such non-military land uses as recreation and access by tribes to cultural and natural resources described for Alternative 2. However, this increase would be small. Continued implementation of scheduling and administrative measures with ongoing training would reduce impacts to recreation and tribal uses to less than significant.

Under Alternative 3, military activities, training, and restriction areas would be confined within the YTC maneuver training area boundaries and would not affect off-Post land uses. To accommodate expanded missions, and concurrently minimize encroachment from or upon the installation, YTC should continue to update management prescriptions in various land use planning and management programs to address greater levels of training uses.

6.9.6 Alternative 4 — GTA Actions + CSS Soldiers + Medium CAB

6.9.6.1 Construction Direct and Indirect Effects

6.9.6.1.1 Less than Significant Effects

There would be no construction projects implemented under Alternative 4 in addition to those that would occur under Alternative 2. Impacts on land uses during construction are described under Alternative 2, and would be temporary and less than significant.

6.9.6.2 Live-fire Training Direct and Indirect Effects

6.9.6.2.1 Less than Significant Effects

Under Alternative 4, additional live-fire training would occur associated with the medium CAB. The primary land use for the impact areas is live-fire training; therefore, current land use designations would not change with the additional training of a medium CAB. The effects of increased training on non-military land uses would be the same as those described under Alternative 3, with the exception of additional impacts to non-military uses from the 110 helicopters that accompany a medium CAB. There would be no change to non-military land use opportunities; however, the visual and noise disturbance from helicopters in flight could diminish the recreation experience for some users. This impact would be less than significant because the primary land use of meeting the military mission would not be affected. Tribal access would not be affected.

The increased number of Soldiers training at YTC under Alternative 4 would increase the frequency of live-fire training area use, thus increasing the number of rounds fired, as well as increased vehicular traffic. Increases in the frequency and intensity of training may increase the frequency of activation of SDZs over that which would occur under Alternatives 2 and 3, which could cause an

adjoining maneuver area to be unavailable for training. There would also be decreased recreation opportunities and tribal access for those adjoining maneuver areas affected by the activation of SDZs; however, these opportunities exist on other training areas at YTC. Impacts to adjoining training areas from increased use of SDZs would be less than significant due to the continued implementation of scheduling, regulatory, and administrative measures described in the CNRMP/ INRMP. Effects to non-military uses from increased live-fire training are anticipated to be less than significant.

6.9.6.3 *Maneuver Training Direct and Indirect Effects*

6.9.6.3.1 *Less than Significant Effects*

There would be no direct and indirect changes to existing land uses from increased maneuver training associated with the medium CAB; however, there would be an increased frequency and intensity of use for maneuver training activities, which could conflict with desired land conditions in training areas. The effects include the physical degradation of soils and vegetation cover as described for Alternative 2; however, the increase above levels that would occur under Alternative 2 would be small. Medium CAB activities involve aviation training, which have less than significant effects on soils and vegetation.

Many of the soils at YTC are susceptible to wind erosion, so that rotor downdrafts during flight training and landing/takeoff operations in maneuver areas or other training ranges would increase the potential for soil erosion. Increased levels of soil erosion and the resulting potential adverse effects to vegetation cover could affect the primary mission of the Land Management Program at YTC to support training by rehabilitating and maintaining land resources to provide a realistic training environment. Any additional effects to soils and vegetation cover from medium CAB training that could affect military training or non-military uses (such as recreation and tribal access) would be less than significant because the effects from helicopter training are likely to be small relative to other training activities that occur on the ground. Further, the YTC Land Management Program conducts routine maintenance and long-term repairs of land resources throughout training areas. In addition, current management and monitoring objectives focus on rehabilitating training damage and support ITAM's goals to revegetate disturbed areas and stabilize soils that have been impacted through training activities. Continued implementation of these objectives would minimize conflicts with land use management plans or policies.

An increase in the frequency of training would increase the effects on non-military land uses of recreation and access by tribes to cultural and natural resources above those described for Alternative 3. Continued implementation of scheduling and administrative measures with ongoing training would reduce impacts to recreation and tribal uses to less than significant. In addition, medium CAB maneuver training would result in indirect effects on non-military uses from visual and noise disturbance from helicopters in flight. These disturbances could diminish the recreation experience for some users. This impact would be less than significant because the primary land use of meeting the military mission would not be affected. Tribal access would not be affected.

Hunting in maneuver areas would be affected by noise disturbances to wildlife from flight and gunnery activities by the medium CAB, and from noise and wind disturbances from low-level helicopter flights. The effects from flight and gunnery activities on wildlife species, including game species, would not be significant, as wildlife populations are habituated to current levels of noise. Impact to hunting activities would not be significant because once these disturbances cease, animals would be able to resume normal activities. Potential impacts to wildlife from helicopter flights are evaluated in greater detail in **Section 6.3.3**. Under Alternative 4, military activities, training, and restriction areas would be confined within the YTC maneuver training area boundaries and would

not affect off-Post land uses. To accommodate expanded missions, and concurrently minimize encroachment from or upon the installation, YTC should continue to update management prescriptions in various land use planning and management programs to address greater levels of training uses.

6.9.7 Cumulative Effects

6.9.7.1 *Less than Significant Effects*

Other projects and activities that could contribute to cumulative impacts on land use and recreation include current ongoing and planned Army projects such as maintenance activities and ongoing and visiting unit training activities at YTC. Alternative 1 would not contribute any new impacts to land use and recreation at YTC or regions surrounding the installation beyond those that are already occurring; therefore, cumulative impacts on land use would remain less than significant under Alternative 1.

Alternatives 2, 3, and 4 would not reallocate or change existing land uses on YTC and would not result in significant impacts to land uses with continued implementation of administrative, management, and monitoring programs. In addition, implementation of other Army and non-Army ongoing and reasonably foreseeable future projects is not likely to reallocate or change current land use designations in YTC. Implementation of other Army projects in addition to Alternative 2, 3, or 4 would increase the frequency and intensity of military uses of existing land, including live-fire and maneuver training activities in ranges. The increased military uses under these alternatives could potentially degrade existing land conditions by increasing soil erosion and increasing the likelihood of igniting wildfires, with Alternative 4 having the biggest contribution to cumulative impacts due to having the greatest amount of training. However, as evaluated in the Soils Erosion analysis (**Section 6.1**), cumulative impacts to soil erosion are expected to be less than significant under all of the alternatives with implementation of current management and monitoring objectives that focus on rehabilitating training damage. In light of historic, ongoing, and reasonably foreseeable future actions, the cumulative impacts to land uses at YTC would be less than significant.

6.9.8 Mitigation

Currently, YTC implements a variety of BMPs to mitigate the effects of the Army's activities on land use. These BMPs include updating management prescriptions in various land use planning and management programs to address greater levels of stationing and training uses and incorporating the GIS program into existing land management programs (**Table 6-33**). In addition, to further reduce land use impacts, YTC proposes to implement establish a Tier 2 Installation Range Control organization that would provide Range Inspectors to monitor and enforce land use policies and assist in controlling avoidable training impacts to natural resources by identifying policy violations (**Table 6-34**).

6.10 TRAFFIC AND TRANSPORTATION

Troops and equipment are transported between Fort Lewis and YTC in convoys as directed by Fort Lewis Regulation 55–2. The annual number of convoys between Fort Lewis and YTC is highly variable. Convoys typically consist of 6 or more vehicles organized to operate as a column or the dispatch of 10 or more vehicles per hour to the same destination over the same route. The approved convoy route from Fort Lewis to YTC is I–5 to I–405 to I–90 to I–82. The convoys are timed to avoid the primary rush hours of 0600 to 0900 and 1500 to 1700 on I–5 and I–405 (Brayton 2009).

6.10.1 Resource-specific Significance Criteria

Factors considered when determining whether an alternative would have a significant impact to traffic and transportation include the extent or degree to which its implementation would result in:

- Intersection operations — increase congestion at intersections currently operating at (or anticipated to operate at) capacity;
- Roadway segment operations — increased traffic on public roads that would disrupt or alter local circulation patterns;
- Construction traffic effects — lane closures or impediments that would disrupt or alter local circulation patterns.

6.10.2 Overview of Impacts to Traffic and Transportation by Alternative

Table 6-24 summarizes the potential impacts to traffic and transportation that would occur under each of the alternatives.

Table 6-24 Summary of Potential Effects to Traffic and Transportation at YTC

Activity Group	Alt 1	Alt 2	Alt 3	Alt 4
Construction Direct and Indirect Effects	•	€	€	€
Live-fire Training Direct and Indirect Effects	€	€	€	€
Maneuver Training Direct and Indirect Effects	€	€	€	€
Cumulative Effects	€	€	€	€

U = Significant Effects
 W = Significant but Mitigable to less than Significant Effects
 € = Less than Significant Effects
 + = Beneficial Effect
 N/A = Not Applicable
 • = No Effects

6.10.3 Alternative 1 — No Action Alternative

6.10.3.1 Construction Direct and Indirect Effects

6.10.3.1.1 No Effect

No additional transportation, cantonment area, range, or other facilities are planned for construction at YTC as part of Alternative 1. No construction-related impacts to traffic and transportation are anticipated.

6.10.3.2 Live-Fire Training Direct and Indirect Effects

6.10.3.2.1 Less than Significant Effects

Traffic associated with live-fire training activities at YTC would remain at current levels and frequencies under Alternative 1. There would be no increased traffic or congestion on public roads or at intersections, and no disruptions in local traffic patterns are anticipated. Therefore, impacts on traffic and transportation would remain less than significant.

6.10.3.3 Maneuver Training Direct and Indirect Effects

6.10.3.3.1 Less than Significant Effects

The type and frequency of maneuver training would not change under Alternative 1. The larger unit maneuvers at the company, battalion, and brigade levels would continue to occur at YTC. The

number of troops participating in a training session is expected to remain at or near existing levels under Alternative 1, and no additional impacts to traffic and transportation are anticipated. Traffic impacts on roadway segments and intersections would remain less than significant.

6.10.3.3.1.1 Access Control Points (ACPs) and Operations

Under Alternative 1, the ACPs and operations are anticipated to remain at current levels. The traffic volumes at the gates and using on-Post streets would not measurably increase on a daily basis. The frequency of the training session traffic at YTC is anticipated to slightly increase through 2015 due to standard growth level increases at Fort Lewis and associated training activities occurring at YTC; however, this increase would be negligible.

6.10.4 Alternative 2 — GTA Actions

6.10.4.1 *Construction Direct and Indirect Effects*

6.10.4.1.1 *Less than Significant Effects*

No additional transportation facilities are planned for construction at YTC under Alternative 2. Construction of new range projects at YTC proposed under Alternative 2 would result in an increase in construction-related vehicles at YTC. Construction-related traffic may result in back-ups at access points, and could interfere with on-Post traffic by causing delays. However, these impacts would be temporary and less than significant.

6.10.4.2 *Live-Fire Training Direct and Indirect Effects*

6.10.4.2.1 *Less than Significant Effects*

Although live-fire training activities at YTC would increase under Alternative 2, the increase would involve smaller groups with fewer vehicles than maneuver training, and would not occur at the same time as maneuver training. Any increase in traffic associated with increased live-fire training would not be noticeable to other motorists and would not disrupt or alter local traffic patterns. Therefore, less than significant impacts on traffic and transportation would be anticipated from live-fire training under Alternative 2.

6.10.4.3 *Maneuver Training Direct and Indirect Effects*

6.10.4.3.1 *Less than Significant Effects*

Under Alternative 2, the larger unit maneuvers at the company, battalion, and brigade levels would continue to occur at YTC. While the number of troops participating in each training session is expected to remain at existing levels, the amount of training would increase by 50 percent under Alternative 2. Therefore, the frequency of convoys traveling between Fort Lewis and YTC would increase by 50 percent. These convoys would continue to use the approved convoy route between Fort Lewis and YTC, and would continue to avoid primary rush hours. Impacts from these convoys could be noticeable by other motorists; however, the impacts would be temporary (only during travel between the installations) and would be less than significant. No long-term impacts on roadway segment or intersection operations would occur.

6.10.4.3.1.1 Access Control Points (ACPs) and Operations

Under Alternative 2, the traffic volumes accessing YTC gates and using on-Post streets would not measurably increase on a daily basis. However, the frequency of the training session traffic accessing YTC is anticipated to increase by up to 50 percent under Alternative 2 because of GTA actions and a

third SBCT training at YTC. This increase would result in more frequent back-ups at ACPs during larger training sessions; however, this impact would be temporary (although recurring) and less than significant.

6.10.5 Alternative 3 — GTA Actions + CSS Soldiers

6.10.5.1 Construction Direct and Indirect Effects

6.10.5.1.1 Less than Significant Effects

Impacts on traffic and transportation from construction activities would be the same as those described under Alternative 2. No additional transportation or other facilities are planned for construction at YTC as part of Alternative 3.

6.10.5.2 Live-Fire Training Direct and Indirect Effects

6.10.5.2.1 Less than Significant Effects

The small increase in live-fire training activities under Alternative 3 would only minimally increase associated traffic over levels anticipated under Alternative 2. This increase would not be noticeable to other motorists and would not disrupt or alter local traffic patterns. Therefore, impacts on traffic and transportation would be less than significant.

6.10.5.3 Maneuver Training Direct and Indirect Effects

6.10.5.3.1 Less than Significant Effects

Under Alternative 3, the number of troops participating in each training session is expected to increase by 3.2 percent compared to Alternative 2 due to the addition of CSS Soldiers to training sessions. This increase in Soldiers would have a resulting increase in convoy size accessing YTC. These convoys would continue to use the approved convoy route between Fort Lewis and YTC, and would continue to avoid primary rush hours. The increase in convoy size under Alternative 3 would be small, and would likely not increase impacts to traffic and transportation. As discussed under Alternative 2, the increased frequency of convoys traveling between Fort Lewis and YTC could be noticeable to other motorists; however, the impacts would be temporary (only during travel between the installations) and would be less than significant.

6.10.5.3.1.1 Access Control Points (ACPs) and Operations

The convoy sizes and subsequent traffic volumes at the gates accessing YTC and using the on-Post streets are anticipated to increase by 3.2 percent compared to Alternative 2. These increases in convoy size and frequency would result in more frequent back-ups at ACPs during larger training sessions; however, these impacts would be temporary (although recurring) and less than significant.

6.10.6 Alternative 4 — GTA Actions + CSS Soldiers + Medium CAB

6.10.6.1 Construction Direct and Indirect Effects

6.10.6.1.1 Less than Significant Effects

Impacts on traffic and transportation from construction activities would be the same as those described under Alternative 2. No additional transportation or other facilities are planned for construction at YTC as part of Alternative 4.

6.10.6.2 Live-Fire Training Direct and Indirect Effects

6.10.6.2.1 Less than Significant Effects

The increase in live-fire training activities under Alternative 4 would only minimally increase associated traffic over levels anticipated under Alternative 3. This increase would not be noticeable to other motorists and would not disrupt or alter local traffic patterns. Therefore, impacts on traffic and transportation would be less than significant.

6.10.6.3 Maneuver Training Direct and Indirect Effects

6.10.6.3.1 Less than Significant Effects

Under Alternative 4, the number of troops participating in each training session is expected to increase by 8.7 percent compared to Alternative 3. This increase in Soldiers would result in an increase in convoy size accessing YTC; however, Soldiers conducting helicopter training would access YTC via the air, and would not contribute to impacts on traffic or transportation. Flight routes and airspace impacts are described in **Section 6.13**. All convoys would continue to use the approved convoy route between Fort Lewis and YTC, and would continue to avoid primary rush hours. The increase in convoy size under Alternative 4 would be small, and would likely not increase impacts to traffic and transportation. As discussed under Alternative 2, the increased frequency of convoys traveling between Fort Lewis and YTC could be noticeable by other motorists; however, the impacts would be temporary (only during travel between the installations) and would be less than significant.

6.10.6.3.1.1 Access Control Points (ACPs) and Operations

The convoy sizes and subsequent traffic volumes at the gates accessing YTC and using the on-Post streets are anticipated to increase by up to 8.7 percent compared to Alternative 3. However, medium CAB Soldiers conducting training in helicopters at YTC would fly the helicopters between Fort Lewis and YTC for training, and would not contribute to impacts on traffic or transportation at ACPs. Any increases in convoy size and frequency that would occur under Alternative 4 would result in more frequent backups at ACPs during larger training sessions; however, these impacts would be temporary (although recurring) and less than significant.

6.10.7 Cumulative Effects

6.10.7.1 Less than Significant Effects

Regional growth in population and employment is expected to increase traffic volumes on I-82 by less than 1 percent per year. Negligible operations impacts are expected from this small increase because I-82 has sufficient capacity to accommodate the change in traffic. The increased size and frequency of convoys traveling between Fort Lewis and YTC under Alternatives 2, 3, and 4 would have an additive impact on traffic along I-82. However, because impacts from convoy traffic would be temporary (although recurring), the resulting cumulative impacts on traffic and transportation would be less than significant. In addition, helicopters associated with the medium CAB under Alternative 4 would be flown to YTC for training activities, and would not contribute to cumulative impacts on transportation or traffic.

6.10.8 Mitigation

The Army would continue to time the convoys traveling between Fort Lewis and YTC to avoid primary rush hours on I-5 and I-405 (**Table 6-33**). The analysis of the direct, indirect, and cumulative effects for the four alternatives concludes that the effects on traffic and transportation are

less than significant. Therefore, no new or additional mitigation is necessary to avoid, limit, repair, reduce, or compensate for the adverse effects.

6.11 SOCIOECONOMICS

6.11.1 Resource-specific Impact Analysis Methodology

A number of measures are used to assess the economic effects that a given alternative could have on the regional economy. Attention is focused on the project-induced effects on population, employment, income, and sales volume.

The initial step in estimating socioeconomic effects is to characterize aspects of the construction and operational phases of the alternatives. With the aid of economic impact modeling techniques (described as follows), the economic effects of each aspect of the alternatives are translated into measures such as jobs and income.

The primary catalyst for changes to socioeconomic resources is a change in economic activity, represented by components such as industrial output (value of goods and services), employment, and income. Changes in employment have the potential to affect population, housing, and associated community services and infrastructure.

The following distinction is made between direct effects and secondary effects, the latter comprising both indirect and induced effects:

- Direct effects are defined as changes in expenditures on goods and services directly related to construction and operation. For example, an increase of \$25 million in the final demand for construction inputs (such as concrete block and brick) will cause that manufacturing sector to increase output by \$25 million worth of concrete block and brick.
- Indirect effects are defined as backward linkages through expenditures on intermediate goods or services required by the direct industry in order to increase output. These include construction or operation labor and other inputs. For example, \$25 million worth of additional concrete block and brick would require increased output by the cement-producing industry (to produce an additional \$2.5 million worth of cement) and aggregate industry (to produce \$0.5 million worth of sand/gravel).
- Induced effects are defined as forward linkages derived from employees (both direct and indirect) spending wages within a region. For example, if additional employees were hired to work in the industries supporting and providing inputs to the construction sector, their personal consumption expenditures will induce employment.

The differentiation among direct, indirect, and induced effects contributes to the concept of the “economic multiplier.” The larger and more highly urbanized the area, the more complex and integrated the economy is likely to be. Thus, more of the additional economic activity would likely occur within the area and increase the size of the multiplier. Conversely, the smaller and more rural an area, the less complex the economy is likely to be, and thus a larger portion of the additional economic activity spurred by the Proposed Action would occur outside the area and decrease the size of the multiplier.

The Army’s EIFS model is used to assess the economic effects of GTA alternatives. Results are compared to RTVs to evaluate the significance of these effects in relation to the regional economy.

RTVs are based on an evaluation of the historical trends for the defined region and measures of local historical fluctuations in the variables of sales volume, income, employment, and population. These evaluations identify the positive and negative changes within which a project can affect the local economy without creating a significant impact. The greatest historical changes define the boundaries that provide a basis for comparing an action's impact on the historical fluctuation in a particular area. Specifically, EIFS sets the upper (positive) boundary by multiplying the maximum historical deviation of the variables by 100 percent; the lower (negative) boundary is set by multiplying the maximum historical deviation of the variables by 75, 67, 67, and 50 percent, respectively. These boundaries determine the amount of change that will affect an area. The percentage allowances are arbitrary, but sensible. The maximum positive historical fluctuation is allowed with expansion because economic growth is beneficial. While cases of damaging economic growth have been cited, and although the zero-growth concept is being accepted by many local planning groups, military base reductions and closures generally are more harmful to local economics than are expansion.

Therefore, if the change in a given variable resulting from a proposed action, such as sales volume, income, employment, or population, is more than the maximum positive historical deviation, i.e., more than 100 percent of the maximum positive historical deviation, it is considered a significant positive impact. However, if the change in a given variable caused by the proposed action is more than 75 percent of the maximum negative historical deviation of sales, it will be considered a significant negative impact.

The potential for disproportionate adverse impacts to minority and low-income populations from implementation of the project was identified during the public scoping process. This issue is addressed in the following sections for each alternative.

Socioeconomic impacts resulting from implementation of any alternative at YTC would be significantly less than those impacts projected for Fort Lewis. This is due to several factors:

1. There would be no additional military personnel or civilian employees assigned to or hired at YTC under any of the alternatives.
2. While the frequency of training and the number of Soldiers trained per year would increase, the economic impact of the increased number of Soldiers visiting YTC would be limited because Soldiers do not generally have an opportunity to leave YTC during training.
3. New construction activity at YTC would be limited under any of the alternatives.

6.11.2 Resource-specific Significance Criteria

Factors considered in determining whether an alternative would have a significant impact on the socioeconomic structure of the ROI would include the extent or degree to which its implementation would:

- Change the local housing market or vacancy rates, particularly when compared to the availability of affordable housing;
- Increase student enrollment beyond the capacity of the local schools;
- Change any social, economic, physical, environmental, or health conditions so as to disproportionately affect low-income or minority populations; or
- Disproportionately endanger children in areas on or near the proposed project activities or installations.

6.11.3 Overview of Socioeconomic Impacts by Alternative

Table 6-25 provides a summary of the socioeconomics-related impacts associated with each of the alternatives.

Table 6-25 Summary of Potential Socioeconomic Impacts at YTC

Construction and Population Change (Economic Effects)	Alt 1	Alt 2	Alt 3	Alt 4
Construction Direct and Indirect Effects	•	€+	€+	€+
Live-fire Training Direct and Indirect Effects	€+	€+	€+	€+
Maneuver Training Direct and Indirect Effects	€+	€+	€+	€+
Cumulative Effects	€+	€+	€+	€+
Housing				
Construction Direct and Indirect Effects	•	•	•	•
Live-fire Training Direct and Indirect Effects	N/A	N/A	N/A	N/A
Maneuver Training Direct and Indirect Effects	N/A	N/A	N/A	N/A
Cumulative Impacts	•	•	•	•
Quality of Life				
Construction Direct and Indirect Effects	•	•	•	•
Live-fire Training Direct and Indirect Effects	•	€	€	€
Maneuver Training Direct and Indirect Effects	•	€	€	€
Cumulative Effects	•	€	€	€
Environmental Justice				
Construction Direct and Indirect Effects	•	•	•	•
Live-fire Training Direct and Indirect Effects	€	€	€	€
Maneuver Training Direct and Indirect Effects	€	€	€	€
Cumulative Effects	€	€	€	€
Protection of Children				
Construction Direct and Indirect Effects	•	€	€	€
Live-fire Training Direct and Indirect Effects	•	•	•	•
Maneuver Training Direct and Indirect Effects	•	•	•	•
Cumulative Effects	•	•	•	•
U = Significant Effects	+ = Beneficial Effect			
W = Significant but Mitigable to less than Significant Effects	N/A = Not Applicable			
€ = Less than Significant Effects	• = No Effects			

6.11.4 Alternative 1 — No Action

Alternative 1 serves as the baseline condition for analysis and includes those stationing decisions that have already been made by Headquarters, Department of the Army to include stationing actions recommended by the BRAC Commission (Army 2007e) as well as Army Global Defense Posture Realignment actions that took place prior to 2009.

6.11.4.1 Construction and Population Change: Economic Effects

6.11.4.1.1 No Effects

Because there would be no new construction at YTC under Alternative 1, there would be no economic impact in the YTC ROI from construction under Alternative 1.

6.11.4.1.1.1 On- and Off-Post Population

Implementation of Alternative 1 would not result in changes to the population in the ROI. There would be no increased labor demand associated with Alternative 1, and thus there would be no immigration of construction workers. There are no new stationing actions contained in Alternative 1, and there would be no increase in active duty military or civilian employment (**Table 6-26**).

Table 6-26 YTC Projected Population Under Alternative 1

	Current	Alternative 1 (FY 2013)	Total Population Increase
Military Personnel	124	124	0
Civilian Employees/Contractors	320	320	0
Military Family Members	188	188	0
Total	632	632	0

6.11.4.2 Live-Fire and Maneuver Training: Economic Effects

6.11.4.2.1 Less than Significant Effects

Soldiers training at YTC are largely confined to YTC during training exercises, and thus the opportunity to interact with the local populace or provide customers to local merchants is limited; as a result, the economic impact generated by the off-Post spending of the Soldiers would be less than significant, although positive.

6.11.4.3 Construction, Live-Fire and Maneuver Training: Housing Effects

6.11.4.3.1 No Effects

There is no on-Post housing at YTC for permanently stationed military personnel or civilian employees (Larson 2009c), and there is no provision under Alternative 1 to construct on-Post housing. There are no increases projected in either the stationed military personnel or civilian employee populations at YTC under Alternative 1. As a result, there would be no impacts to on-Post housing or the off-Post housing market in the ROI.

6.11.4.4 Construction, Live-Fire and Maneuver Training: Quality of Life Effects

6.11.4.4.1 No Effects

Service-related impacts are usually the result of increased populations of military personnel or civilian employees. Alternative 1 would not result in an increase in either the on-Post or off-Post population. As a result, there would be no increase in the demand for on- or off-Post schools or child care facilities, family support, retirement, public safety, and other services. In addition, no increases in demand for on- or off-Post shops or recreation are anticipated.

6.11.4.5 *Construction, Live-Fire and Maneuver Training: Environmental Justice*

6.11.4.5.1 *Less than Significant Effects*

Construction impacts are temporary in nature, but they can range from annoying to detrimental for those living near a construction site. Because no construction activity is proposed under Alternative 1, no construction-related adverse impacts to low-income and minority communities would be realized.

During training activities at YTC, minority and low-income populations living near YTC would be expected to continue to experience noise disturbance under Alternative 1. Because weapons noise contours extend off the installation boundary, and because the percentage of minority and low-income individuals residing in the ROI is higher than the percentage in Washington State as a whole, disproportionate effects to these populations from noise may occur. However, given that the areas where noise contours extend beyond the installation boundary are sparsely populated or unpopulated and zoned for agricultural uses (USACHPPM 2008a), that there would not be an increase in the frequency of loud noises, and that weapons noise would remain intermittent and infrequent, these effects would not be significant. Therefore, no disproportionately high and adverse effects on minority and low-income populations are anticipated under Alternative 1.

6.11.4.6 *Construction, Live-Fire and Maneuver Training: Protection of Children*

6.11.4.6.1 *No Effect*

There are no construction activities contained under Alternative 1; as a result, there is no potential for adverse impacts to children during construction. There are no children currently residing or regularly present at YTC, so there would be no effects on children during training exercises.

6.11.5 Alternative 2 — GTA Actions

6.11.5.1 *Construction and Population Change: Economic Effects*

6.11.5.1.1 *Less than Significant Effects*

Implementation of Alternative 2 at YTC would involve more frequent training activities. In order to meet the needs of Alternative 2, YTC must construct the necessary ranges required to meet training readiness standards of units it receives as part of the growth and realignment of the Army. The currently scheduled range/training infrastructure construction projects for FY 10 through FY 15 are shown in **Table 6-27**.

Table 6-27 Proposed Construction Projects at YTC Under Alternative 2

Range	Expected Start of Construction	Estimated Cost
Sniper Field Fire	FY 2011	\$3.75 million
Multi-purpose Machine Gun Range	FY 2014	\$1.9 million

Construction of the ranges at YTC under Alternative 2 would result in a small positive economic benefit in the YTC ROI as shown in **Table 6-28**.

The changes in specific economic parameters would fall well within historical fluctuations, as represented by the RTVs shown in **Table 6-28**, and would thus be considered minor and less than significant.

6.11.5.1.1.1 On- and Off-Post Population

Due to the small size of the construction projects at YTC under Alternative 2, no temporary movement of workers from outside the ROI to fill the supply of construction job opportunities is expected. No new military personnel or civilian employees would be stationed at YTC under Alternative 2; the population at YTC would remain as shown in **Table 6-26**.

Table 6-28 Economic Impacts from Construction and Population Change at YTC under Alternative 2

Fiscal Year	Indicator	Projected Change	Change (Percentage)	Rational Threshold Values Range (Percentage)
2011	Direct Sales Volume	\$3,750,000		
	Total Sales Volume	\$9,487,500	0.15	-6.69 to 10.05
	Direct Income	\$635,774		
	Total Income	\$1,608,507	0.03	-8.61 to 9.88
	Direct Employment	18		
	Total Employment	45	0.034	-3.1 to 6.49
	Local Population	0		-0.9 to 1.49
	Local Off-Post Population	0		
2014	Direct Sales Volume	\$1,900,000		
	Total Sales Volume	\$4,807,000	0.07	-6.69 to 10.05
	Direct Income	\$322,125		
	Total Income	\$814,977	0.02	-8.61 to 9.88
	Direct Employment	9		
	Total Employment	23	0.02	-3.1 to 6.49
	Local Population	0		-0.9 to 1.49
	Local Off-Post Population	0		

6.11.5.2 Live-Fire and Maneuver Training: Economic Effects

6.11.5.2.1 Less than Significant Effects

Increased live-fire and maneuver training at YTC may result in some less than significant, beneficial economic impacts. Additional maneuver training would increase the demand for liquid fuels at YTC. Some portion of this additional demand may be met by local commercial establishments. The direct and indirect impacts of these purchases would be positive, but would be less than significant.

Soldiers training at YTC are largely confined to YTC during training exercises, and thus the opportunity to interact with the local populace or provide customers to local merchants is limited. As a result, the economic impact generated by the off-Post spending of the Soldiers would be less than significant. Increased on-Post spending by the additional Soldiers undergoing training at YTC may generate indirect effects as replacement stock is purchased from local providers; this impact, however, is projected to be less than significant.

The increase in frequency of gunnery training under Alternative 2 could provide additional ignition sources for range fires on the installation, which could cause economic damage if a large fire were to burn off the installation and damage private property. However, the risk of such a fire would continue to be more dependent on weather conditions and the success of YTC’s fire management program rather than on the frequency of training activities. In addition, while an escaped fire could

have a significant economic effect on adjacent private landowners, the overall economic impact to the region would be insignificant (Army 2004b).

In summary, the direct and indirect economic impacts from increased live-fire and maneuver training at YTC are projected to be less than significant.

6.11.5.3 Construction, Live-Fire and Maneuver Training: Housing Effects

6.11.5.3.1 No Effects

There is no on-Post housing at YTC for permanently stationed military personnel or civilians, and there is no provision under Alternative 2 to construct on-Post housing. There are no increases projected in stationed military or civilian populations at YTC because of actions under Alternative 2. Soldiers visiting YTC for training reside at YTC in barracks or in the field as part of their training. As a result, there would be no impacts to on- or off-Post housing under this alternative.

6.11.5.4 Construction, Live-Fire and Maneuver Training: Quality of Life Effects

6.11.5.4.1 Less than Significant Effects

Alternative 2 would not result in an increase in either the on-Post or off-Post populations; as a result, there would be no increase in demand for schools or on- or off-Post child care facilities, public safety, and other services. However, increased live-fire and maneuver training under Alternative 2 would result in less than significant quality of life impacts, as described below.

6.11.5.4.1.1 Family Support and Retirement Services

Because YTC is a training center, it offers very limited services to families of active duty Soldiers or retirees. Family support and retirement services would continue to be provided to residents and retirees by the Army Community Support Center, the Family Connection, Family Readiness Groups, and the Retirement Services Office located at Fort Lewis.

No immediate increase in the retiree population is anticipated. No new active duty personnel would be assigned to YTC under Alternative 2. Although some of the older active duty personnel may possibly choose to retire or settle in this area after discharge or retirement, the small number of active duty personnel suggests that it is unlikely that Alternative 2 would have an impact on the retiree population.

6.11.5.4.1.2 Shops and Services, On-Post

The limited number and variety of on-Post shops and services at YTC may be impacted under Alternative 2 as a result of increased training activities at YTC. For instance, there may be additional demands placed on these limited retail facilities at YTC by visiting Soldiers. However, these impacts are projected to be less than significant. The development of any infrastructure to house additional shops and services would undergo separate NEPA review before implementation in accordance with regulations and current practice.

6.11.5.4.1.3 Shops and Services, Off-Post

There are projected to be no impacts to off-Post shops and services in the YTC ROI because of actions under Alternative 2. Although the frequency of training activities at YTC would increase, Soldiers are generally confined to YTC during training activities, thus restricting their ability to partake of off-Post services and shopping.

6.11.5.4.1.4 Recreation

Demand for recreational facilities could increase with the additional training activities at YTC considered under Alternative 2. The increase in demand for on-Post recreational facilities from Soldiers training at YTC could result in assigned personnel increasing the demand for off-Post recreational facilities (assigned personnel can choose to utilize off-Post facilities, whereas Soldiers training at YTC cannot). The services provided through the private sector can be expected to respond to the increased demand by increasing supply.

6.11.5.5 Construction, Live-Fire and Maneuver Training: Environmental Justice

6.11.5.5.1 Less than Significant Effects

Construction impacts are temporary in nature, but they can range from annoying to detrimental for those living near a construction site. Because any construction activity would be carried out within the boundaries of YTC, and because there are no permanent housing facilities at YTC, no adverse impacts to low-income and minority communities from construction are expected. Impacts from noise, dust, and traffic generated by construction would be minimized by careful construction planning. Fugitive dust emissions would be minimized throughout the construction period by use of conventional dust suppression, BMPs, and mitigation techniques, such as soil erosion and sedimentation control, restrictions on where vehicles can travel on site, speed controls for construction vehicles and equipment, and watering of exposed soil and demolition debris to control dust. Noise from construction equipment would be controlled by use of appropriate sound mitigation techniques and BMPs. Construction traffic during peak hours would be reduced by the use of centralized construction staging areas.

During training activities at YTC, minority and low-income populations living near YTC would be expected to experience greater amounts of noise disturbance under Alternative 2 than under Alternative 1 as a result of the increased frequency of training. Because weapons noise contours extend off the installation boundary, and because the percentage of minority and low-income individuals residing in the ROI is higher than the percentage in Washington State as whole, disproportionate effects to these populations from noise may occur. However, given that the areas where noise contours extend beyond the installation boundary are sparsely populated or unpopulated and zoned for agricultural uses (USACHPPM 2008a), that there would be an increase in the frequency of loud noises rather than in the noise levels themselves, and that weapons noise, even with the additional training, would remain intermittent and infrequent, these effects would not be significant. Therefore, no disproportionately high and adverse effects on minority and low-income populations are anticipated during training activities under Alternative 2.

6.11.5.6 Construction, Live-Fire and Maneuver Training: Protection of Children

6.11.5.6.1 Less than Significant Effects

There is a potential for minor, short-term, adverse impacts to children during construction. Because construction sites can be appealing to children, construction activity and vehicle traffic could pose an increased safety risk. None of the construction projects contained in Alternative 2 would be located within the cantonment area of YTC, where children may occasionally be present. There is no housing at YTC in which children could be found. Range areas, in which the construction and training under Alternative 2 would be located, are off-limits to all but authorized personnel; children are not authorized personnel.

Despite the fact that children are highly unlikely to ever be found on a training range, barriers and “no trespassing” signs would be placed around construction sites to deter children from playing in these areas, as well as to keep out other trespassers. All construction vehicles, equipment, and materials would be stored in fenced areas and secured when not in use. During construction, safety

measures stated in 29 CFR Part 1926, “Safety and Health Regulations for Construction,” and other applicable regulations and guidance would be followed to protect the health and safety of all personnel and employees at YTC, as well as construction workers. Therefore, less than significant impacts on children are anticipated.

6.11.6 Alternative 3 — GTA Actions + CSS Soldiers

6.11.6.1 Construction and Population Change: Economic Effects

6.11.6.1.1 Less than Significant Effects

No additional construction of infrastructure or training facilities is projected at YTC under Alternative 3 in excess of that described for Alternative 2. Accordingly, the economic impacts of construction under Alternative 3 would be identical to those of Alternative 2.

6.11.6.1.1.1 On- and Off-Post Population

Due to the small size of the construction projects at YTC under Alternative 3, no temporary movement of workers from outside the ROI to fill the supply of construction job opportunities is expected. No new military personnel or civilian employees would be stationed at YTC under Alternative 3; the population at YTC would remain as shown in **Table 6-26**.

6.11.6.2 Live-Fire Training and Maneuver Training: Economic Effects

6.11.6.2.1 Less than Significant Effects

The increase in live-fire and maneuver training at YTC under Alternative 3 may result in some less than significant, beneficial economic impacts. These impacts would be the same as those described for Alternative 2 above, and would not noticeably increase with the additional increase in training under Alternative 3.

6.11.6.3 Construction, Live-Fire Training, and Maneuver Training: Housing Effects

6.11.6.3.1 No Effect

There is no on-Post housing at YTC for permanently stationed military personnel or civilians, and there is no provision under Alternative 3 to construct such housing. There are no increases projected in either the stationed military or civilian populations at YTC because of actions under Alternative 3. Soldiers visiting YTC for training reside at YTC in barracks or in the field as part of their training. As a result, there would be no impacts to on- or off-Post housing under this alternative.

6.11.6.4 Construction, Live-Fire Training, and Maneuver Training: Quality of Life Effects

6.11.6.4.1 Less than Significant Effects

Alternative 3 would not result in an increase in either the on-Post or off-Post population; as a result, there would be no increase in demand for schools or on- or off-Post child care facilities, public safety, or other services. Impacts on family support and retirement services, on- and off-Post shops, and recreation opportunities from increased live-fire and maneuver training under Alternative 3 would be the same as those described under Alternative 2 and would be less than significant.

6.11.6.5 Construction, Live-Fire Training, and Maneuver Training: Environmental Justice

6.11.6.5.1 Less than Significant Effects

Construction impacts are temporary in nature, but they can range from annoying to detrimental for those living near a construction site. Because any construction activity would be carried out within the boundaries of YTC, and because there are no permanent housing facilities at YTC, no adverse

impacts to low-income and minority communities from construction are expected. All construction-related mitigation measures and BMPs to reduce impacts from noise, dust, and traffic that are described under Alternative 2 would also be implemented under Alternative 3. During training activities at YTC, minority and low-income populations living near YTC would be expected to experience greater amounts of noise disturbance under Alternative 3 than under Alternative 2 because of the increased frequency of training. Because weapons noise contours extend off the installation boundary, and because the percentage of minority and low-income individuals residing in the ROI is higher than the percentage in Washington State as a whole, disproportionate effects to these populations from noise may occur. However, given that the areas where noise contours extend beyond the installation boundary are sparsely populated or unpopulated and zoned for agricultural uses (USACHPPM 2008a), that there would be an increase in the frequency of loud noises rather than in the noise levels themselves, and that weapons noise, even with the additional training, would remain intermittent and infrequent, these effects would not be significant. Therefore, no disproportionately high and adverse effects on minority and low-income populations are anticipated because of increased training under Alternative 3.

6.11.6.6 Construction, Live-Fire Training, and Maneuver Training: Protection of Children

6.11.6.6.1 Less than Significant Effects

Potential impacts on children from implementation of Alternative 3 would be the same as those described for Alternative 2. No additional construction activities beyond those described for Alternative 2 would occur under Alternative 3, and all construction-related safety measures and BMPs described above would also be implemented under Alternative 3.

6.11.7 Alternative 4 — GTA Actions + CSS Soldiers + Medium CAB

6.11.7.1 Construction and Population Change: Economic Effects

6.11.7.1.1 Less than Significant Effects

No additional construction of infrastructure or training facilities is proposed at YTC under Alternative 4 in excess of those detailed for Alternative 2. Accordingly, the economic impacts of construction under Alternative 4 would be identical to those of Alternative 2.

6.11.7.1.1.1 On- and Off-Post Population

Due to the small size of the construction projects at YTC under Alternative 4, no temporary movement of workers from outside the ROI to fill the supply of construction job opportunities is expected. No new military personnel or civilian employees would be stationed at YTC under Alternative 4; the population at YTC would remain as shown in **Table 6-26**.

6.11.7.2 Live-Fire Training and Maneuver Training: Economic Effects

6.11.7.2.1 Less than Significant Effects

Increased live-fire and maneuver training at YTC may result in some less than significant, beneficial economic impacts. These impacts would be the same as those described for Alternative 2 above, and would not noticeably increase with the additional increase in training under Alternative 4.

6.11.7.3 Construction, Live-Fire Training, and Maneuver Training: Housing Effects

6.11.7.3.1 No Effect

There is no on-Post housing at YTC for permanently assigned military personnel or civilian employees. There are no increases projected in either the stationed military or civilian populations at

YTC as a result of actions under Alternative 4. Soldiers visiting YTC for training reside at YTC in barracks or in the field as part of their training. As a result, there would be no impacts to on- or off-Post housing under this alternative.

6.11.7.4 Construction, Live-Fire Training, and Maneuver Training: Quality of Life Effects

6.11.7.4.1 Less than Significant Effects

No increase in the assigned population at YTC would occur under Alternative 4; as a result, there would be no increase in demand for schools or on- or off-Post child care facilities, public safety, or similar services. Impacts on family support and retirement services, on- and off-Post shops, and recreation opportunities from increased live-fire and maneuver training under Alternative 4 would be the same as those described under Alternative 2 and would be less than significant.

6.11.7.5 Construction, Live-Fire Training, and Maneuver Training: Environmental Justice

6.11.7.5.1 Less than Significant Effects

Construction impacts are temporary in nature, but they can range from annoying to detrimental for those living near a construction site. Because any construction activity would be carried out within the boundaries of YTC, and because there are no permanent housing facilities at YTC, few or no adverse impacts to low-income and minority communities from construction are expected. All construction-related mitigation measures and BMPs to reduce impacts from noise, dust, and traffic that are described under Alternative 2 would also be implemented under Alternative 4.

Minority and low-income populations living near YTC would be expected to experience greater amounts of noise disturbance under Alternative 4 than under the other alternatives as a result of the increase in gunnery and aviation training. Because both aircraft and weapons noise contours extend off the installation boundary, and because the percentage of minority and low-income individuals residing in the ROI is higher than the percentage in Washington State as a whole, disproportionate effects to these populations from noise may occur. However, given that the areas where noise contours extend beyond the installation boundary are sparsely populated or unpopulated and zoned for agricultural uses (USACHPPM 2008a), that there would be an increase in the frequency of loud noises rather than in the noise levels themselves, and that weapons noise, even with the additional training, would remain intermittent and infrequent, these effects would not be significant.

Therefore, no disproportionately high and adverse effects on minority and low-income populations are anticipated during construction or operations under Alternative 4.

6.11.7.6 Construction, Live-Fire Training, and Maneuver Training: Protection of Children

6.11.7.6.1 Less than Significant Effects

Potential impacts on children from implementation of Alternative 4 would be the same as those described for Alternative 2. No additional construction activities beyond those described for Alternative 2 would occur under Alternative 4, and all construction-related safety measures and BMPs described above would also be implemented under Alternative 4.

6.11.8 Cumulative Effects

6.11.8.1 *Less than Significant Effects*

Less than significant, beneficial, cumulative economic effects would occur under all of the alternatives due to the direct and indirect economic impacts generated by continued and increased live-fire and maneuver training actions, in combination with ongoing military training activities occurring at YTC. Because Alternative 1 would not result in any direct or indirect impacts on housing, quality of life, environmental justice, or protection of children, this alternative would not contribute to cumulative impacts on these resources. Less than significant cumulative impacts on low-income and minority populations would occur under the action alternatives due to a cumulative increase in training and associated increases in noise and disruptions in conjunction with other ongoing and visiting unit training. In addition, less than significant, cumulative quality of life impacts are anticipated from the action alternatives due to the potential for a cumulative increase in demand on on- and off-Post retail/shopping facilities and recreation opportunities due to an increase in the number of Soldiers training, in conjunction with ongoing training by other visiting units. However, the action alternatives would not contribute to cumulative impacts on housing since they would not result in any direct or indirect impacts on this resource.

6.11.9 Mitigation

The analysis of the direct, indirect, and cumulative socioeconomic effects for the four alternatives concludes that the effects are less than significant. Therefore, no new or additional mitigation is necessary to avoid, limit, repair, reduce, or compensate for the adverse effects.

6.12 HAZARDOUS MATERIALS AND WASTES

Numerous federal, state, and local laws regulate the storage, use, recycling, disposal, and transportation of hazardous materials and waste. The methods for assessing potential hazards associated with hazardous materials and wastes for each project alternative generally include the following:

- Reviewing and evaluating each of the alternatives to identify the action's potential to use hazardous materials or to generate hazardous waste based on the activities proposed;
- Comparing the location of each proposed project activity with baseline data on known or potentially contaminated areas including land containing UXO;
- Assessing the compliance of each proposed project activity with applicable site-specific hazardous materials and waste management plans;
- Assessing the compliance of each proposed project activity with applicable site-specific Army SOPs and health and safety plans in order to avoid potential hazards; and
- Determination of known or suspected contamination potentially affected by each proposed project activity, including ongoing Army IRP remediation activities.

The overall methodology, including data sources and assumptions, used to conduct the human health and safety hazard impact evaluation is consistent with the Army NEPA Manual for Installation Operations and Training. This manual describes the various types of materials and waste that should be considered to identify potential impacts of the proposed project activities.

The following issue relating to hazardous materials and wastes at YTC was identified during public scoping. This issue is addressed in the following sections for each alternative.

- The effects on the environment from a potential release of hazardous/toxic chemicals during operations or because of an accident.

6.12.1 Resource-specific Significance Criteria

Factors considered in determining whether hazardous material and waste associated with each project alternative would result in a significant impact include the extent or degree to which the alternative's implementation would:

- Endanger the public or environment during the storage, transport, or use of ammunition;
- Expose military personnel or the public to areas potentially containing UXO without protocols for protection;
- Cause a spill or release of a hazardous substance (as defined by Title 40, CFR Part 302 [CERCLA], or Parts 110, 112, 116 and 117 [CWA]);
- Expose the environment or public to any hazardous condition through release or disposal (for example, exposure to toxic substances including pesticides/ herbicides or open burn/open detonation disposal of unused ordnance);
- Adversely affect contaminated sites or the progress of IRP remediation activities;
- Cause the accidental release of friable (easily crumbled by hand pressure) asbestos or LBP during the demolition or renovation of a structure; or
- Generate either hazardous or acutely hazardous waste, resulting in increased regulatory requirements over the long term.

All of the action alternatives would result in an increase in the use of hazardous materials and subsequent generation, handling, storage, and disposal of larger quantities of wastes, including hazardous wastes. The Army follows strict SOPs for storing and using hazardous materials; therefore, no new procedures would need to be implemented to store or use the construction-related or operation-related hazardous materials. The regulatory and administrative requirements that would be implemented to minimize impacts to the environment or human health and safety are summarized in the following subsections.

6.12.2 Overview of Impacts to Hazardous Materials and Wastes by Alternative

Table 6-29 summarizes the potential impacts associated with hazardous materials and hazardous wastes that would occur under each of the alternatives.

Table 6-29 Summary of Effects to Hazardous Materials and Wastes at YTC

Activity Group	Alt 1	Alt 2	Alt 3	Alt 4
Construction Direct and Indirect Effects	€	€	€	€
Live-fire Training Direct and Indirect Effects	€	€	€	€
Maneuver Training Direct and Indirect Effects	€	€	€	€
Cumulative Effects	€	€	€	€

U = Significant Effects
 W = Significant but Mitigable to less than Significant Effects
 € = Less than Significant Effects
 + = Beneficial Effect
 N/A = Not Applicable
 • = No Effects

6.12.3 Alternative 1 — No Action Alternative

6.12.3.1 Construction Direct and Indirect Effects

6.12.3.1.1 Less than Significant Effects

No cantonment area or range construction is proposed under Alternative 1. Therefore, no construction-related impacts associated with hazardous materials and wastes would occur.

Hazardous materials used or hazardous wastes generated at YTC would continue to include fuels, paints, solvents, lubricants, coolants, sealers, adhesives, refrigerants, compressed gases, batteries, cleaners, sanitation chemicals, munitions and UXO, biohazardous waste, pesticides and herbicides, asbestos- and lead-contaminated materials, PCBs, low-level radioactive wastes, and POLs. The Army would continue to manage hazardous materials and wastes similar to current conditions as described in **Section 5.12**.

Pesticides and herbicides would continue to be used within both the cantonment area and the training areas. With continued pest management in accordance with the IPMP, impacts would be less than significant because pesticide and herbicide use would be controlled to minimize the potential for human exposure or endangerment of the environment.

6.12.3.2 Live-fire Training Direct and Indirect Effects

6.12.3.2.1 Less than Significant Effects

Under Alternative 1, the number of live-fire training days per year and the quantity of munitions used would remain similar to those under current conditions. Ammunition handling and storage methods, disposal protocols, and safety procedures would continue to be conducted in accordance with existing regulations. YTC would continue to implement the existing Ammunition Supply Point SOP for storage and transportation of additional munitions. Compliance with existing Army protocols would minimize the amounts of hazardous materials used and the quantities of wastes generated during training at YTC. With continued implementation of existing federal, state, and Army protocols, impacts are expected to be less than significant because current Army protocols for protection of Army personnel and the public would minimize the safety risks associated with ammunition and live-fire training.

The use of munitions during training would continue to generate UXO and spread lead within the live-fire impact zones similar to current rates, and the Army would continue to implement regulatory and administrative measures for range maintenance and repair. UXO would only be within the impact areas, which are fenced and posted as restricted to public access. The expanded EOD Company would continue to respond to discoveries of UXO for safe open detonation in place or at a designated range location. Impact zones would be temporarily closed and remediated as needed. Impacts would be less than significant because current Army protocols for the protection of Army personnel and the public would reduce the safety risks associated with UXO and would minimize the potential for human or environmental exposure to UXO or lead.

When Soldiers train at the ranges, safety protocols must be followed in order to protect the public from injury or accidents. SDZs are established in accordance with Army Pamphlet 385-64, Ammunition and Explosive Safety Standards. In addition, in order to prevent conflict with recreational activities in areas near the training ranges, land use restrictions are set up to limit access to the areas during range training times. SDZs are included in the design configuration for the proposed ranges at YTC.

Additionally, similar safety protocols must be implemented to protect Army personnel during range training. Soldiers are given safety manuals with a complete discussion of safety procedures while training. In addition, before training, Soldiers are briefed on range-specific safety measures that may be necessary during the special exercise. Finally, Soldiers and officers are provided with field manuals for each specific operation and exercise that give more detailed procedures and protocols to be followed in order to prevent accidents. All government personnel or government contractors accessing impact areas would continue to follow OSHA and Army standards and guidelines to minimize health and safety impacts from exposure to any contaminants or ordnance. With continued implementation of existing federal, state, and Army protocols, impacts are expected to be less than significant because current Army protocols for protection of Army personnel and the public would minimize the safety risks associated with live-fire training.

6.12.3.3 Maneuver Training Direct and Indirect Effects

6.12.3.3.1 Less than Significant Effects

Under Alternative 1, the use of munitions during maneuver training would continue to generate UXO and spread lead within the live-fire impact zones similar to the current generation rates. Impacts associated with the generation of UXO and lead, as well as range degradation, would be similar to those described for live-fire training. Impact zones would be temporarily closed and remediated as needed. Impacts would be less than significant because current Army protocols for the protection of Army personnel and the public would reduce the safety risks associated with UXO and would also minimize the potential for human or environmental exposure to UXO or lead.

Maneuver training also includes convoying the vehicles and equipment to the training areas. Under Alternative 1, the number of vehicles and equipment used for maneuver training would remain similar to current conditions. Maneuver training would continue to require the transport, storage, and use of POLs. With continued implementation of standard Army regulatory and administrative requirements, impacts would be less than significant because the likelihood of POL spills would be minimized and inadvertent spills would be quickly identified and remediated to avoid exposure of military personnel or the public and to prevent endangerment of the public or environment.

6.12.4 Alternative 2 — GTA Actions

6.12.4.1 Construction Direct and Indirect Effects

6.12.4.1.1 Less than Significant Effects

Construction-related activities would require the short-term use of hazardous materials and POLs in excess of existing quantities; however, contract specifications control the purchase amounts and use of hazardous materials and require compliance with federal, state, and local requirements and with installation policy on hazardous materials. Impacts would be less than significant because continued implementation of standard Army regulatory and administrative measures would minimize the potential for inadvertent spills or exposure of Army personnel, the public, or the environment to hazardous materials during construction. Construction of the new ranges, along with a large increase in utilization of the facilities at all of the training areas under Alternative 2, may require additional on-site waste storage and more frequent waste pickup.

Because the new ranges would be constructed within lands previously used as ranges, the presence of UXO and lead may be encountered. With continued implementation of regulatory and administrative mitigation measures as described in **Section 5.12**, impacts would be less than significant because current Army protocols would minimize the risk for exposure of construction

personnel to UXO and lead and there would be minimal potential for exposure of Army personnel, the public, or the environment to hazardous wastes generated during construction.

In order to maintain the two new ranges, Alternative 2 would result in the use of slightly increased amounts of pesticides and herbicides compared to current usage. With continued pest management in accordance with the IPMP, impacts would be less than significant because pesticide and herbicide use would be controlled to minimize the potential for human exposure or endangerment of the environment.

6.12.4.2 Live-fire Training Direct and Indirect Effects

6.12.4.2.1 Less than Significant Effects

Although the use of large caliber munitions would increase compared to Alternative 1, ammunition handling and storage methods, disposal protocols, and safety procedures would continue to be conducted in accordance with existing regulations. Impacts would be less than significant because current Army protocols for the protection of Army personnel and the public would reduce the safety risks associated with the use of ammunition and live-fire training.

Compared to Alternative 1, this alternative would result in increased quantities of POLs transported, stored, and used on Post over the long-term due to a greater number of vehicles used for training at YTC. Transportation, storage, and use of additional quantities of POLs would slightly increase the risk of inadvertent spills or releases of hazardous materials. YTC would continue to use aboveground storage tanks for storage of fuels and other petroleum products. Secondary containment would also be used at the vehicle maintenance and repair locations. The continued use of these containment systems would minimize the risk of area contamination from inadvertent POL spills. With continued implementation of standard Army regulatory and administrative requirements, impacts would be less than significant because the likelihood of POL spills would be minimized and inadvertent spills would be quickly identified and remediated to avoid exposure of military personnel or the public and to prevent endangerment of the public or environment.

As a result of increased training and greater quantities of munitions used during training under this alternative, additional quantities of UXO and lead would be generated within the live-fire impact zones and range degradation would occur at an accelerated rate compared to Alternative 1. Impact zones would be temporarily closed and remediated as needed. The frequency of range maintenance and remediation would be adjusted for the rate of range degradation associated with the intensity of training under Alternative 2. Impacts would be less than significant because current Army protocols for the protection of Army personnel and the public would reduce the safety risks associated with UXO and would minimize the potential for human or environmental exposure to UXO or lead.

6.12.4.3 Maneuver Training Direct and Indirect Effects

6.12.4.3.1 Less than Significant Effects

Because of additional quantities of munitions used for this alternative due to increased training, UXO and lead would be generated at a greater rate compared to Alternative 1. Impacts associated with generation of UXO and lead and range degradation would be similar to those described for live-fire training. Impact zones would be temporarily closed and remediated as needed. The frequency of range maintenance and remediation would be adjusted for the rate of range degradation associated with the intensity of training under Alternative 2. Impacts would be less than significant because continued implementation of standard Army protocols for the protection of Army personnel and the public would minimize the potential for human or environmental exposure to UXO or lead.

Compared to Alternative 1, additional quantities of POLs would be transported, stored, and used with a subsequent slightly increased risk of inadvertent spills or releases of hazardous materials. With continued implementation of standard Army regulatory and administrative requirements, impacts would be less than significant because the likelihood of POL spills would be minimized and inadvertent spills would be quickly identified and remediated to avoid exposure of Army personnel or the public and to prevent endangerment of the public or environment.

6.12.5 Alternative 3 — GTA Actions + CSS Soldiers

6.12.5.1 Construction Direct and Indirect Effects

6.12.5.1.1 Less than Significant Effects

Under Alternative 3, the only construction proposed at YTC would be the two new ranges described for Alternative 2. Impacts would be the same as those described under Alternative 2, and would be less than significant.

6.12.5.2 Live-fire Training Direct and Indirect Effects

6.12.5.2.1 Less than Significant Effects

Although the use of large caliber munitions would increase under Alternative 3 compared to Alternative 2, ammunition handling and storage methods, disposal protocols, and safety procedures would continue to be conducted in accordance with existing regulations. Impacts would be less than significant because continued implementation of standard Army protocols for munitions and for the protection of Army personnel and the public would reduce the safety risks associated with the use of ammunition and live-fire training.

Impacts of live-fire training would be similar to those described for Alternative 2; however, larger quantities of UXO and lead would be generated within the live-fire impact zones and range degradation would occur at an accelerated rate as a result of increased quantities of munitions used. Impact zones would be temporarily closed and remediated as needed. The frequency of range maintenance and remediation would be adjusted for the rate of range degradation associated with the intensity of training under Alternative 3. Impacts would be less than significant because continued implementation of standard Army protocols for the protection of Army personnel and the public would minimize the potential for human or environmental exposure to UXO or lead.

6.12.5.3 Maneuver Training Direct and Indirect Effects

6.12.5.3.1 Less than Significant Effects

Impacts associated with generation of UXO and lead and range degradation would be similar to those described for live-fire training for Alternative 3. While the intensity of maneuver training would increase compared to Alternative 2, impacts would be less than significant because continued implementation of standard Army protocols for the protection of Army personnel and the public would minimize the potential for human or environmental exposure to UXO or lead.

Compared to Alternative 2, the number of vehicles, equipment, and personnel involved in maneuver training would increase under Alternative 3, with a proportionate increase in the quantities of POLs transported, stored, and used, and a slightly increased risk of inadvertent spills or releases of hazardous materials. With continued implementation of standard Army regulatory and administrative requirements, impacts would be less than significant because the likelihood of POL spills would be

minimized and inadvertent spills would be quickly identified and remediated to avoid exposure of military personnel or the public and to prevent endangerment of the public or environment.

6.12.6 Alternative 4 — GTA Actions + CSS Soldiers + Medium CAB

6.12.6.1 Construction Direct and Indirect Effects

6.12.6.1.1 Less than Significant Effects

Under Alternative 4, the only construction proposed at YTC would be the two new ranges described for Alternative 2. Construction-related impacts associated with hazardous materials and wastes would be similar to those for Alternative 2 and would be less than significant.

6.12.6.2 Live-fire Training Direct and Indirect Effects

6.12.6.2.1 Less than Significant Effects

In addition to weapons qualifications, the medium CAB would conduct aerial gunnery training that would increase live-fire training at YTC. Ammunition handling and storage methods, disposal protocols, and safety procedures would be conducted in accordance with existing regulations. Impacts would be less than significant because continued implementation of standard Army protocols for munitions and for the protection of Army personnel and the public would reduce the safety risks associated with the use of ammunition and live-fire training.

Impacts of live-fire training would be similar to those described for Alternatives 2 and 3; however, UXO and lead would be generated within the live-fire impact zones and range degradation would occur at accelerated rates proportionate to the additional quantities of munitions used for training under this alternative. Impact zones would be temporarily closed and remediated as needed. The frequency of range maintenance and remediation would be adjusted for the rate of range degradation associated with the intensity of training under Alternative 4. Impacts would be less than significant because continued implementation of standard Army protocols for the protection of Army personnel and the public would minimize the potential for human or environmental exposure to UXO or lead.

6.12.6.3 Maneuver Training Direct and Indirect Effects

6.12.6.3.1 Less than Significant Effects

Maneuver training impacts would be similar to those described for Alternatives 2 and 3; however, the medium CAB unit would contribute additional Soldiers, vehicles, and equipment, including helicopters. Impacts associated with generation of UXO and lead and range degradation would be similar to those described for live-fire training. Impacts would be less than significant because continued implementation of standard Army protocols for the protection of Army personnel and the public would minimize the potential for human or environmental exposure to UXO or lead.

Because the number of vehicles and personnel involved in maneuver training would increase, greater quantities of POLs would be transported, stored, and used compared to Alternative 3. Therefore, the risk of inadvertent spills or releases of hazardous materials would slightly increase. YTC would continue to implement the appropriate management plans to minimize potential adverse effects from accidental leaks or spills resulting from the storage of additional petroleum products. With continued implementation of standard Army regulatory and administrative requirements, impacts would be less than significant because the likelihood of POL spills would be minimized and inadvertent spills would be quickly identified and remediated to avoid exposure of Army personnel or the public and to prevent endangerment of the public or environment.

6.12.7 Cumulative Effects

6.12.7.1 *Less than Significant Effects*

Military and nonmilitary actions that would contribute to cumulative effects on hazardous materials and wastes include ongoing military training activities at YTC, including HIMARS launching and training by visiting units, expanded capabilities of the existing SBCTs, a new ESC, and a Battlefield Surveillance Brigade, as well as anticipated regional population growth and development and changes in management practices in the Interior Columbia River Basin. There has been an increase in the use and handling of hazardous materials, releases of toxic materials, and generation of solid and hazardous wastes. Ongoing training activities at YTC would contribute slightly to this cumulative increase. Increased training under Alternatives 2, 3, and 4 would add slightly to the quantity of potential hazardous waste that would need to be managed at YTC. Each increase in training at YTC increases the amount of waste materials generated and the risk of release of hazardous substances. Regional anticipated population growth would continue to contribute cumulatively to the generation of hazardous and solid wastes. However, regional efforts to use non-toxic and recyclable materials and to recycle waste materials help to offset the regional increase. Efforts to achieve zero net waste at YTC would help to minimize the Army's contribution to this regional increase. With continued implementation of regulatory and administrative measures, including the Army's protocols and SOPs for transport, storage, handling, and disposal of hazardous materials and wastes, cumulative impacts associated with hazardous materials and wastes would be less than significant.

6.12.8 Mitigation

Currently, YTC implements a variety of BMPs to mitigate the hazardous materials and hazardous waste related effects of the Army's activities. These BMPs include following all federal, state, Army, and Fort Lewis regulations for managing, storing, using, and disposing of hazardous materials and wastes; implementing the Integrated Solid Waste Management Plan at the installation; and maintaining adequate hazardous waste management capabilities to support current and increased requirements based on training load (**Table 6-33**). The analysis of the direct, indirect, and cumulative effects for the four alternatives concludes that the hazardous materials and waste related effects are less than significant. Therefore, no new or additional mitigation is necessary to avoid, limit, repair, reduce, or compensate for the adverse effects.

6.13 AIRSPACE

Impacts on airspace were assessed by evaluating the potential effects of both project construction and operations activities on the principal attributes of airspace, namely controlled and uncontrolled or navigable airspace, special use airspace, en-route airways and jet routes, and airports/airfields. Impacts on controlled and uncontrolled airspace were assessed by determining if the project would reduce the amount of navigable airspace by creating new or expanding existing special use airspace by introducing temporary flight restrictions or by constituting an obstruction to air navigation. Impacts on special use airspace were assessed by determining the project's requirement for modifications to existing special use airspace. Impacts on en-route airways were assessed by determining if the project would lead to a change in a regular flight course or altitude or instrument procedures. Impacts on airports and airfields were assessed by determining if the project restricts access to or affects the use of airports or airfields available for public use, or if it affects airfield or airport arrival and departure traffic flows.

6.13.1 Resource-specific Significance Criteria

Factors considered in determining whether an alternative would have a significant impact on airspace, based in part on FAA Order 7400.2G, Procedures for Handling Airspace Matters (FAA 2008), include the extent or degree to which its implementation would result in the following:

- Reduce the amount of navigable airspace;
- Lead to the assignment of new special use airspace (including prohibited areas, restricted areas, warning areas, and military operations areas) or require the modification of special use airspace;
- Change an existing or planned IFR minimum flight altitude, a published or special instrument procedure, or an IFR departure procedure, or require a visual flight rules operation change from a regular flight course or altitude;
- Restrict access to or affect the use of airports or airfields available for public use, or if it would affect commercial or private airfield or airport arrival and departure traffic flows; or
- Create an obstruction to air navigation.

6.13.2 Overview of Impacts to Airspace by Alternative

Table 6-30 summarizes the potential impacts associated with airspace resources that would occur under each of the alternatives.

Table 6-30 Summary of Potential Effects to Airspace at YTC

Activity Group	Alt 1	Alt 2	Alt 3	Alt 4
Construction Direct and Indirect Effects	•	•	•	•
Live-fire Training Direct and Indirect Effects	€	€	€	€
Maneuver Training Direct and Indirect Effects	€	€	€	€
Cumulative Effects	€	€	€	€

U = Significant Effects

W = Significant but Mitigable to less than Significant Effects

€ = Less than Significant Effects

+ = Beneficial Effect

N/A = Not Applicable

• = No Effects

6.13.3 Alternative 1 — No Action Alternative

6.13.3.1 Construction Direct and Indirect Effects

6.13.3.1.1 No Effects

No construction projects are proposed under Alternative 1; therefore, no construction-related impacts to airspace would occur.

6.13.3.2 Live-fire Training Direct and Indirect Effects

6.13.3.2.1 Less than Significant Effects

Implementation of this alternative would continue the less than significant impacts that currently affect airspace resources at YTC. This alternative would not require modifications to existing controlled or special use airspace, and no new special use airspace would be needed. The Special Use Airspace (Restricted Area R-6714) that already exists over YTC excludes non-participating and incompatible aircraft from flying below 55,000 feet above MSL without YTC or ATC's permission. Helicopters, fixed-wing aircraft, and UASs would continue to operate in restricted airspace over

YTC. Current operations, which could include artillery firing, aerial gunnery and bombardment, and high-speed and high-density aerial operations, would continue to occur.

6.13.3.3 Maneuver Training Direct and Indirect Effects

6.13.3.3.1 Less than Significant Effects

Maneuver training conducted under this alternative would continue the less than significant impacts that currently affect airspace resources at YTC. This alternative would not require modifications to existing controlled or special use airspace, and no new special use airspace would be needed. The restriction on airspace would allow all current flight operations to continue safely throughout the maneuver training areas without potential interference. Helicopters, fixed-wing aircraft, and UASs would continue to operate in the restricted airspace over YTC unimpeded by non-participating or incompatible aircraft. The daily training flights of the USAAAD's seven-helicopter Medevac unit would continue to occur. Other maneuver operations would continue to occur with the same limited effects on airspace that YTC experiences (aircraft participating in maneuver training alone or with other units and avoidance of active live-fire ranges).

6.13.4 Alternative 2 — GTA Actions

6.13.4.1 Construction Direct and Indirect Effects

6.13.4.1.1 No Effects

Construction of the two range projects at YTC would temporarily increase human presence and activity at the construction sites. It would not, however, create obstructions to air navigation, affect flight operations at VAH, Selah airstrip, or any other airfield, or otherwise affect the use of airspace over YTC. Finally, the proposed construction would not require the FAA to modify existing controlled or special use airspace or create new special use airspace.

6.13.4.2 Live-fire Training Direct and Indirect Effects

6.13.4.2.1 Less than Significant Effects

The increase in live-fire training associated with Alternative 2 would result in less than significant impacts to airspace resources at YTC. The overall increase in live-fire training would not create obstructions to air navigation, affect flight operations at VAH, Selah airstrip, or any other airfield, or require the FAA to modify existing controlled or special use airspace or create new special use airspace.

Although activity on the live-fire ranges would increase, Army helicopters, fixed-wing aircraft, and UASs would continue to conduct training in the restricted airspace over YTC. Additional coordination and scheduling would be required to balance increased training requirements with the availability of airspace. This coordination would prevent non-participating flight operations from occurring over active live-fire ranges where artillery firing, aerial gunnery and bombardment, or other active training may be present. Finally, training of the additional Soldiers would not require modifications to existing controlled or special use airspace, and no new special use airspace would be needed.

6.13.4.3 Maneuver Training Direct and Indirect Effects

6.13.4.3.1 Less than Significant Effects

The increase in maneuver training associated with Alternative 2 would result in less than significant impacts to airspace resources at YTC. The overall increase in maneuver training would not create

obstructions to air navigation, affect flight operations at VAH, Selah airstrip, or any other airfield, or require the FAA to modify existing controlled or special use airspace or create new special use airspace.

Although maneuver training conducted under this alternative would increase in frequency and intensity, it would result in less than significant effects to airspace resources at YTC. Army helicopters, fixed-wing aircraft, and UASs would continue to operate over training areas in support of maneuver training. The restriction on airspace would allow flight operations to continue safely throughout the maneuver training areas without potential interference from non-participating or incompatible aircraft. Consequently, this alternative would not require modifications to existing controlled or special use airspace, and no new special use airspace would be needed.

6.13.5 Alternative 3 — GTA Actions + CSS Soldiers

6.13.5.1 Construction Direct and Indirect Effects

6.13.5.1.1 No Effects

No additional construction is proposed under Alternative 3 above that which would occur under Alternative 2. There would be no effects to airspace from construction.

6.13.5.2 Live-fire Training Direct and Indirect Effects

6.13.5.2.1 Less than Significant Effects

Impacts on airspace from increased live-fire training under Alternative 3 would be the same as those described under Alternative 2 and would be less than significant. No additional impacts on airspace are anticipated from CSS training under Alternative 3.

6.13.5.3 Maneuver Training Direct and Indirect Effects

6.13.5.3.1 Less than Significant Effects

Impacts on airspace from increased maneuver training under Alternative 3 would be the same as those described under Alternative 2 and would be less than significant. No additional impacts on airspace are anticipated from CSS training under Alternative 3.

6.13.6 Alternative 4 — GTA Actions + CSS Soldiers + Medium CAB

6.13.6.1 Construction Direct and Indirect Effects

6.13.6.1.1 No Effects

No additional construction is proposed under Alternative 4 above that which would occur under Alternative 2. There would be no effects to airspace from construction.

6.13.6.2 Live-fire Training Direct and Indirect Effects

6.13.6.2.1 Less than Significant Effects

The increase in live-fire training associated with Alternative 4 would result in less than significant impacts to airspace resources at YTC. The overall increase in live-fire training would not create obstructions to air navigation, affect flight operations at VAH, Selah airstrip, or any other airfield, or require the FAA to modify existing controlled or special use airspace or create new special use airspace.

Activity on the live-fire ranges would increase more under this alternative than under any of the other alternatives. This increase primarily would be the result of the medium CAB's live-fire training. The amount of aerial gunnery on live-fire ranges would increase. Army helicopters, fixed-wing aircraft, and UASs would continue to conduct training in the restricted airspace over YTC. Additional coordination and scheduling would be required to balance increased training requirements with the availability of airspace. This coordination would prevent non-participating flight operations from occurring over active live-fire ranges where artillery firing, aerial gunnery and bombardment, or other active training may be present. Finally, training of the additional Soldiers associated with the medium CAB would not require modifications to existing controlled or special use airspace, and no new special use airspace would be needed.

6.13.6.3 Maneuver Training Direct and Indirect Effects

6.13.6.3.1 Less than Significant Effects

The increase in maneuver training would be greatest under this alternative. In addition to the annual training requirements of the three SBCTs, the additional GTA Soldiers, and CSS Soldiers, this alternative would involve a substantial increase in helicopter maneuver training. Approximately 1,450 flight hours would be flown in training at YTC (Clayton 2009a). The addition of these hours would substantially increase the current flight training hours conducted at YTC (Rodriguez 2009). The addition of the medium CAB also would double the overall number of takeoffs and landings at VAH from approximately 2,600 to 5,500 (Clayton 2009a).

Although the increase in the number of flight hours and landings and takeoffs appears substantial when compared to the current environment, the direct and indirect effects would be less than significant. Even with the units currently training at VAH, the restricted airspace is readily available and can easily accommodate the increase in flight training hours, landings, and takeoffs (Rodriguez 2009). Thus, the increase in maneuver training associated with the medium CAB would not create obstructions to air navigation, affect flight operations at VAH, Selah airstrip, or any other airfield, or require the FAA to modify existing controlled or special use airspace or create new special use airspace. The restriction on airspace and MOAs would allow flight operations to occur safely throughout the maneuver training areas without potential interference from non-participating or incompatible aircraft. Consequently, this alternative would not require modifications to existing controlled or special use airspace, and no new special use airspace would be needed.

6.13.7 Cumulative Effects

6.13.7.1 Less than Significant Effects

Cumulative effects would be less than significant under all of the alternatives. All of the action alternatives would generate new less than significant impacts to airspace resources (despite the addition of a medium CAB under Alternative 4). These effects would overlap the direct and indirect effects of the HIMARS rocket training. The potential launching of a maximum of 432 HIMARS rockets annually at YTC (216 for certification and 216 for collective training) would affect the use of airspace over YTC during the launches. Two HIMARS battalions would launch up to 108 rockets during each of four HIMARS certification and four collective training exercises that would occur each year. The cumulative effects of ongoing training and the HIMARS training would be less than significant. The crews would launch the rockets from two general firing areas in TA 16 and in the MPRC SDZ into the CIA. Air traffic would be restricted from the airspace when these training launches occur. Because air traffic in the YTC airspace would be limited only for a short period, the cumulative effects would be less than significant.

6.13.8 Mitigation

The analysis of the direct, indirect, and cumulative effects on airspace for the four alternatives concludes that the effects are less than significant. Therefore, no new or additional mitigation is necessary to avoid, limit, repair, reduce, or compensate for the adverse effects.

6.14 FACILITIES

The evaluation of potential impacts to real estate, installation facilities, infrastructure, and telecommunications is based on the project's potential to affect these facilities. Potential infrastructure shortfalls, inconsistencies, inadequacies, or deficiencies identified between the existing infrastructure and the requirements of a project alternative are identified. Where the existing facilities and infrastructure do not meet the mission requirements, the additional facilities and infrastructure would be acquired through construction by the Army or through community or private sector mechanisms. The effects of acquiring the additional facilities and infrastructure are assessed in this section.

Population changes projected for the proposed project were used for forecasting utility and public services demands. These utility forecasts were compared to existing levels of use and infrastructure capacities to determine if capacities would be exceeded.

The facilities impact analysis identifies the potential environmental consequences to Army real property, including lands, facilities, and infrastructure, within the ROIs for each project alternative. The environmental consequences to facilities, such as buildings, structures, and other improvements and utilities infrastructure are assessed for each alternative. This analysis included identification and evaluation of the mission requirements for facilities and infrastructure and the extent to which each installation already meets these requirements. The analysis also evaluates the need for upgrades to existing facilities or infrastructure and any secondary impacts associated with those upgrades.

This analysis includes potential impacts on infrastructure for potable water and wastewater systems and storm water management. Existing telecommunications systems are adequate for the planned activities for any of the alternatives. No impact analysis was required for this utility. Potential impacts to housing and educational facilities, land use compatibility, transportation infrastructure, energy infrastructure (electricity and natural gas), and waste management are analyzed in other sections of this document.

There is currently no shortage of land at YTC. No real estate or land acquisitions would occur under any of the alternatives. The proposed activities for all of the alternatives would occur within the current Army installation. Existing land ownership, rights-of-way (ROWs), easements, and leases on YTC would continue with no changes or additions. No impacts analysis was required for these components.

6.14.1 Resource-specific Significance Criteria

Factors considered in determining whether an alternative would have a significant impact on real estate, facilities, or infrastructure would include the extent or degree to which its implementation would result in the following:

- Result in potential shortfalls, inconsistencies, inadequacies, or deficiencies between the existing facilities or utility infrastructure and the requirements of a project alternative;

- Interrupt or disrupt public services or utilities, as a result of physical displacement and subsequent relocation of public utility infrastructure, to the extent that the result would be a direct, long-term service interruption or permanent disruption of essential public utilities; or
- Result in an increase in demand for public services or utilities beyond the capacity of the utility provider to the point that substantial expansion, additional facilities, or increased staffing levels would be necessary.

6.14.2 Overview of Impacts to Facilities by Alternative

Table 6-31 summarizes the potential impacts on facilities and utility infrastructure that would occur under each of the alternatives.

Table 6-31 Summary of Potential Effects on Facilities and Utility Infrastructure at YTC

Activity Group	Alt 1	Alt 2	Alt 3	Alt 4
Construction Direct and Indirect Effects	•	€/+	€/+	€/+
Live-fire Training Direct and Indirect Effects	€	€	€	€
Maneuver Training Direct and Indirect Effects	€	€	€	€
Cumulative Effects	€	€	€	€

U = Significant Effects
 W = Significant but Mitigable to less than Significant Effects
 € = Less than Significant Effects

+ = Beneficial Effect
 N/A = Not Applicable
 • = No Effects

6.14.3 Alternative 1 — No Action Alternative

6.14.3.1 Construction Direct and Indirect Effects

6.14.3.1.1 No Effects

6.14.3.1.1.1 Facilities

Implementation of Alternative 1 would result in no new cantonment facilities or range improvements. Many of the buildings at YTC are aging and in need of renovation or replacement; however, the existing cantonment facilities and ranges at YTC are anticipated to be adequate to support the projected training under Alternative 1. If the need for new facilities were identified, construction of these facilities would be analyzed under separate NEPA studies.

The existing ranges would continue to be used and maintained similar to current conditions. Regulatory and administrative management programs, such as ITAM, natural resource management, ecosystem management, and AR 350–19, The Army Sustainable Range Program, would continue to be implemented at all training areas. There would be no construction-related impacts to facilities for this alternative.

6.14.3.1.1.2 Utility Infrastructure

Under Alternative 1, no additional utility infrastructure would be constructed, and demand on utilities and infrastructure would be similar to current conditions. The capacities of the existing potable water, wastewater treatment, and storm water management systems are well above current and anticipated peak demands (Army 2007e). There would be no construction-related impacts to utility infrastructure for this alternative.

6.14.3.2 Live-fire Training Direct and Indirect Effects

6.14.3.2.1 Less than Significant Effects

6.14.3.2.1.1 Facilities

Existing live-fire training facilities are expected to be adequate to support training as proposed for this alternative. Live-fire training would continue to result in range degradation at current rates and the Army would continue to implement administrative management programs, such as ITAM, natural resource management, ecosystem management, and AR 350–19, The Army Sustainable Range Program, to manage range degradation. In addition, the Army would continue to implement SOPs for range sustainability and water and energy conservation. While there would be no new impacts to live-fire training facilities under this alternative, less than significant impacts on facilities would continue from the continuation of weapons qualifications at current training levels.

6.14.3.2.1.2 Utility Infrastructure

The amount of live-fire training projected for this alternative would not result in increased demand for utilities compared to current conditions; existing demands would continue. The capacities of the existing potable water, wastewater treatment, and storm water management systems are well above current and anticipated peak demands for live-fire training as projected under this alternative (Army 2007e). Therefore, impacts on utility infrastructure from live-fire training under this alternative would continue to be less than significant.

6.14.3.3 Maneuver Training Direct and Indirect Effects

6.14.3.3.1 Less than Significant Effects

6.14.3.3.1.1 Facilities

Under Alternative 1, maneuver training would be conducted in the same locations as are presently used and would continue to cause range and training area degradation at current rates. Existing facilities would be adequate to support training as projected under Alternative 1. The use of munitions during training would continue to generate UXO and lead within the live-fire impact zones. The Army would continue to implement administrative management programs, such as ITAM, natural resources management, ecosystem management, and AR 350–19, The Army Sustainable Range Program, at all training areas. In addition, the Army would continue to implement SOPs for range sustainability and water and energy conservation. Therefore, impacts on facilities from maneuver training under this alternative would continue to be less than significant.

6.14.3.3.1.2 Utility Infrastructure

The amount of maneuver training projected for this alternative would not result in increased demand for utilities compared to current conditions. The capacities of the existing potable water, wastewater treatment, and storm water management systems are well above current and anticipated peak demands for maneuver training as projected under this alternative (Army 2007e). Therefore, impacts on utility infrastructure from maneuver training under this alternative would continue to be less than significant.

6.14.4 Alternative 2 — GTA Actions

6.14.4.1 Construction Direct and Indirect Effects

6.14.4.1.1 Less than Significant Effects

6.14.4.1.1.1 Facilities

Many of the buildings at YTC are aging and in need of renovation or replacement. Under Alternative 2, no additional facilities are proposed within the cantonment area; however, increased training under

this alternative would likely accelerate the need for replacing aging training and mobilization facilities at YTC. YTC has adequate space for construction of new facilities. If the need for new facilities were identified, construction of these facilities would be analyzed under separate NEPA studies.

Under Alternative 2, the two proposed range construction projects planned would enhance available training infrastructure at YTC. The new ranges would be constructed within existing ranges and YTC has adequate space for construction of these new facilities. No impacts to existing facilities are anticipated. Short-term impacts during range improvements would include the potential to encounter UXO and lead; however, implementation of the regulatory and administrative measures for construction described in **Section 4.14** would minimize the risk for exposure of construction personnel to UXO and lead. Over the long term, the proposed range improvements under this alternative would result in beneficial and less than significant impacts to facilities.

6.14.4.1.1.2 Utility Infrastructure

An initial capital investment may be required to extend the energy infrastructure at YTC to the new ranges proposed under this alternative. Impacts would be less than significant because this impact would be limited to the Army installation.

Utility demand for this alternative would be similar to current conditions because the resident population at YTC would not change and both new ranges would be outdoor ranges that would have minimal demands for public utilities. The new ranges and any appurtenant facilities would be designed with water- and energy-saving features to achieve a minimum of Silver LEED rating and would comply with AR 11–27, Army Energy Program; EO 13123, Greening the Government through Efficient Energy Management; EO 13423, Strengthening Federal Environmental, Energy, and Transportation Management; and the requirements under the new Energy Independence and Security Act of 2007. Water- and energy-saving features would likely offset some of the additional demand on public utilities. Impacts on demand for public utilities would be less than significant because the capacities of the existing potable water, wastewater treatment, and storm water management systems are well above current and anticipated peak demands (Army 2007e).

During construction, power, natural gas, and water lines may need to be routed to new planned facilities. Construction activities could result in short-term service interruptions in order to connect new lines and extend service. This impact would be temporary, and the length of disruptions would be minimized to the greatest extent possible during this period. Impacts on public utility infrastructure would be less than significant because these impacts would be limited to the Army installation and service would be returned to normal after construction is completed.

6.14.4.2 *Live-fire Training Direct and Indirect Effects*

6.14.4.2.1 *Less than Significant Effects*

6.14.4.2.1.1 Facilities

Compared to Alternative 1, the frequency of live-fire training at YTC would increase by as much as 50 percent. The frequency of use would increase for all range types, the number of rounds fired would increase significantly for each range, and the use of large caliber munitions would increase. The two ranges projects proposed under Alternative 2 would support additional live-fire training needs, and would offset some of the increased demand on the existing ranges at YTC. Therefore, impacts on facilities from increased live-fire training would be less than significant because live-fire training facilities are expected to be adequate to support live-fire training as projected for this alternative.

As a result of greater quantities of munitions used under this alternative, additional quantities of UXO and lead would be generated in the live-fire impact zones and range degradation would occur at an accelerated rate compared to Alternative 1. With continued implementation of regulatory and administrative management programs for range sustainability, such as ITAM, natural resources and ecosystem management, and AR 350–19, The Army Sustainable Range Program, impacts would be less than significant because the impact zones would be remediated as needed. The frequency of range maintenance efforts would be adjusted for the intensity of use and rate of range degradation under Alternative 2.

6.14.4.2.1.2 Utility Infrastructure

Increases in live-fire training under Alternative 2 would result in an increased demand for utilities compared to Alternative 1; however, the Army would continue to implement water and energy conservation measures to minimize utility demands. Impacts on utility infrastructure would be less than significant because the existing utility infrastructure at YTC would have sufficient excess capacity for the anticipated peak demands for live-fire training as projected under this alternative (Army 2007e).

6.14.4.3 *Maneuver Training Direct and Indirect Effects*

6.14.4.3.1 *Less than Significant Effects*

6.14.4.3.1.1 Facilities

Maneuver training, which requires extensive areas of open land, would be restricted to existing training and maneuver areas at YTC. This alternative would result in an increased number of days of off-road vehicle maneuver within the training areas, including TAs 10, 11, and 12. Additional maneuver land at YTC would also be available if needed. Impacts would be less than significant because maneuver training facilities are expected to be adequate to support the projected maneuver training under this alternative.

Over time, the increased intensity in training under Alternative 2 would degrade the training areas at an accelerated rate compared to Alternative 1. Degradation of the training areas may reduce the types, quality, and quantity of training activities that YTC can support. The use of the training areas could not be rotated at the current frequency and would, therefore, have insufficient periods of time for recovery or restoration of vegetation, as required under the LRAM Program. The training lands would require additional repairs for damages caused by maneuver training and would result in increased demands on administrative management programs for management of the training areas. The frequency of training area maintenance efforts would be adjusted for the intensity of use and rate of degradation under Alternative 2. Maintenance costs for the training areas would increase in proportion to the rate of damage incurred. With continued implementation of administrative management programs, such as ITAM, natural resource management, ecosystem management, and AR 350-19, The Army Sustainable Range Program, impacts would be less than significant because the training areas would be maintained and repaired as needed.

As a result of increased maneuver training under this alternative, UXO and lead would be generated and accumulate at accelerated rates compared to Alternative 1. Impacts associated with UXO and lead would be similar to those described for live-fire training. However, impacts on facilities would be less than significant because the impact zones would be remediated as needed.

6.14.4.3.1.2 Utility Infrastructure

With the increase in maneuver training projected under Alternative 2, the demand for public utilities would increase; however, the Army would continue to implement water and energy conservation

measures to minimize utility demands. Impacts on utility infrastructure would be less than significant because the existing utility infrastructure at YTC would have sufficient excess capacity for the anticipated peak demands for maneuver training as projected under this alternative (Army 2007e).

6.14.5 Alternative 3 — GTA Actions + CSS Soldiers

6.14.5.1 Construction Direct and Indirect Effects

6.14.5.1.1 Less than Significant Effects

6.14.5.1.1.1 Facilities

Construction-related impacts on facilities would be the same as those described for Alternative 2, and would be beneficial and less than significant because the facilities at YTC would be adequate for training as projected for this alternative. No additional construction would occur under Alternative 3.

The addition of the CSS logistics units would create an increase in demand for adequate mobilization facilities at YTC. The facilities at YTC are anticipated to be adequate to support training under Alternative 3; however, the aging training and mobilization facilities at YTC would likely need to be replaced over time. If the need for new energy infrastructure were identified, construction of these facilities would be analyzed under separate NEPA studies.

6.14.5.1.1.2 Utility Infrastructure

Construction-related impacts on utility infrastructure would be the same as those described for Alternative 2.

6.14.5.2 Live-fire Training Direct and Indirect Effects

6.14.5.2.1 Less than Significant Effects

6.14.5.2.1.1 Facilities

Under Alternative 3, the number of live-fire training days per year would increase at YTC compared to Alternative 2; however, this increase would be minor. The two new ranges proposed under this alternative would support additional live-fire training and would offset some of the increased demand on the existing ranges at YTC. Impacts on facilities would be less than significant because live-fire training facilities are anticipated to be adequate to support the increased intensity of live-fire training as projected for Alternative 3. Impacts from the use of greater quantities of munitions under Alternative 3 would be similar to, but slightly greater than, those described under Alternative 2.

6.14.5.2.1.2 Utility Infrastructure

The amount of live-fire training projected for this alternative would result in increased demand for utilities compared to Alternative 2; however, the Army would continue to implement water and energy conservation measures to minimize utility demands. Impacts on utility infrastructure would be less than significant because the existing utility infrastructure at YTC would have sufficient excess capacity for the anticipated peak demands for live-fire training as projected under this alternative (Army 2007e).

6.14.5.3 Maneuver Training Direct and Indirect Effects

6.14.5.3.1 Less than Significant Effects

6.14.5.3.1.1 Facilities

Existing maneuver training facilities at YTC are anticipated to be sufficient to support the increased training requirements under Alternative 3. Additional maneuver land at YTC would also be available

if needed. Impacts would be less than significant because maneuver training facilities at YTC are anticipated to be sufficient to support the training requirements as anticipated for Alternative 3.

The addition of the CSS logistics unit to the SBCT maneuver training under Alternative 3 would increase the number of vehicles involved in training exercises and potentially accelerate the rate of degradation of the training areas. Consequently, Alternative 3 would place increased demands on administrative management programs for sustainability of the training areas. The frequency of training area maintenance efforts would be adjusted for the intensity of use and rate of degradation under Alternative 3. With continued implementation of these programs, such as ITAM, natural resource management, ecosystem management, and AR 350–19, The Army Sustainable Range Program, impacts on facilities would be less than significant because the training areas would be maintained and repaired as needed.

6.14.5.3.1.2 Utility Infrastructure

Training projected for this alternative would result in an increased demand for utilities compared to Alternative 2; however, the Army would continue to implement water and energy conservation measures to minimize utility demands. Impacts on utility infrastructure would be less than significant because the existing utility infrastructure at YTC would have sufficient excess capacity for the anticipated peak demands for maneuver training as projected under this alternative (Army 2007e).

6.14.6 Alternative 4 — GTA Actions + CSS Soldiers + Medium CAB

6.14.6.1 Construction Direct and Indirect Effects

6.14.6.1.1 Less than Significant Effects

6.14.6.1.1.1 Facilities

Construction-related impacts would be the same as those described for Alternative 2, and would be beneficial and less than significant. No additional construction would occur under Alternative 4.

The addition of a medium CAB training at YTC under Alternative 4 would create an increased demand for adequate mobilization facilities at YTC, as well as adequate helicopter hangar and maintenance facilities. Live-fire and maneuver training facilities are anticipated to be sufficient to support training requirements proposed under this alternative; however, the aging training and mobilization facilities at YTC would likely need to be replaced over time. If the need for new facilities were identified, construction of these facilities would be analyzed under separate NEPA studies.

6.14.6.1.1.2 Utility Infrastructure

Construction-related impacts on utility infrastructure would be the same as those described for Alternative 2.

6.14.6.2 Live-fire Training Direct and Indirect Effects

6.14.6.2.1 Less than Significant Effects

6.14.6.2.1.1 Facilities

The medium CAB would increase the use of aerial gunnery ranges for live-fire training. Existing live-fire training facilities are expected to be adequate for the increase in training under Alternative 4. In addition, the two new proposed ranges would support additional live-fire training and would offset some of the increased demand on the existing ranges at YTC. Impacts on facilities would be less than significant because the ranges would be maintained and repaired as needed.

As a result of increased live-fire training under this alternative, UXO and lead waste would be generated and accumulate at accelerated rates. With continued implementation of administrative management programs, such as ITAM, natural resource management, ecosystem management, and AR 350–19, The Army Sustainable Range Program, impacts on facilities would be less than significant because the impact zones would be remediated as needed.

6.14.6.2.1.2 Utility Infrastructure

The amount of live-fire training projected for this alternative would result in an increased demand for utilities compared to Alternative 3; however, the Army would continue to implement water and energy conservation measures to minimize utility demands and the new water- and energy-saving features of the two new ranges would likely offset some of the additional demand on public utilities. Impacts on utility infrastructure would be less than significant because the existing utility infrastructure at YTC would have sufficient excess capacity for the anticipated peak demands for live-fire training as projected for this alternative.

6.14.6.3 *Maneuver Training Direct and Indirect Effects*

6.14.6.3.1 *Less than Significant Effects*

6.14.6.3.1.1 Facilities

Maneuver training with medium CAB support includes large-scale aviation training requiring extensive training areas. The medium CAB would also provide helicopter air support for some maneuvers and may change the scale and extent of some maneuver training. Impacts on facilities would be less than significant because maneuver training facilities would be adequate for training as projected for this alternative. Additional maneuver land would also be available at YTC if needed.

Under Alternative 4, the addition of a medium CAB to maneuver training would increase the number of vehicles and equipment involved in training exercises and potentially increase the rate of degradation of the training areas. Consequently, Alternative 4 would place increased demands on administrative management programs for management of the training areas. The frequency of training area maintenance efforts would be adjusted for the intensity of use and rate of degradation under Alternative 4. With continued implementation of administrative management programs, such as ITAM, natural resource management, ecosystem management, and AR 350–19, The Army Sustainable Range Program, impacts on facilities would be less than significant because the training areas would be maintained and repaired as needed.

6.14.6.3.1.2 Utility Infrastructure

The amount of maneuver training projected for this alternative would result in an increased demand for utilities compared to Alternative 3; however, the Army would continue to implement water and energy conservation measures to minimize utility demands and the new water- and energy-saving features of the two new ranges would likely offset some of the additional demand on public utilities. Impacts on utility infrastructure would be less than significant because the existing utility infrastructure at YTC would have sufficient excess capacity for the anticipated peak demands for maneuver training as projected for this alternative (Army 2007e).

6.14.7 Cumulative Effects

6.14.7.1 *Less than Significant Effects*

Other projects or actions that would contribute to cumulative impacts on facilities and infrastructure at and around YTC primarily include regional population growth; ongoing military activities at YTC; conversion of rural lands near the installation to commercial, industrial, and residential uses; and water developments on the Columbia and Yakima Rivers. In addition to growth at the installation,

continued regional population growth and development in the surrounding region, as well as ongoing construction and training activities at YTC, would continue to increase regional utility demands.

Reasonably foreseeable actions include continuation of those past and present activities including continued training by all units currently stationed at Fort Lewis as well as visiting units and training by HIMARS battalions, and the necessary replacement of aging training and mobilization facilities at YTC. Facilities at YTC are designed to support units from Fort Lewis and other outside units rotating in and out of the installation for training. The addition of a third permanent SBCT training at YTC, in addition to training of GTA and CSS Soldiers and a medium CAB, under the action alternatives would likely accelerate the need for replacing aging training and mobilization facilities, as well as increase demand for adequate training and mobilization facilities and associated utilities at YTC. However, new commercial and residential development on and off Post would incorporate technologies for water and energy conservation, minimizing the impacts of regional utility demands. Long-term effects to facilities and utility demands and infrastructure at YTC would be less than significant.

Activities occurring in the region outside the installation would generally not affect facilities at YTC. Future construction projects, such as the proposed transmission line through the installation, could result in localized restrictions on land available for new facilities.

Under all of the alternatives, but most intense under Alternative 4, the long-term cumulative impacts to facilities would result in range degradation at an accelerated rate proportionate to the intensity of use. However, with continued implementation of administrative management programs, such as ITAM, natural resource management, ecosystem management, and AR 350–19, The Army Sustainable Range Program, cumulative impacts on facilities and utility infrastructure would be less than significant because ranges would be maintained and repaired as needed.

6.14.8 Mitigation

YTC BMPs require that all new buildings and facilities incorporate water and energy conservation measures in facilities designs to comply with AR 11–27, Army Energy Program; EO 13123, Greening the Government through Efficient Energy Management; EO 13423, Strengthening Federal Environmental, Energy, and Transportation Management; EO 13514, Federal Leadership in Environmental, Energy, and Economic Performance; and the requirements under the new Energy Independence and Security Act of 2007 (**Table 6-33**). The analysis of the direct, indirect, and cumulative effects for the four alternatives on facilities concludes that the effects are less than significant. Therefore, no new or additional mitigation is necessary to avoid, limit, repair, reduce, or compensate for the adverse effects.

6.15 ENERGY DEMAND/GENERATION

The evaluation of potential impacts to energy demand or generation, delivery systems, or costs is based on the project's potential to affect energy demand and costs. Population changes, including the numbers of Soldiers training at YTC, as projected for each alternative were used for forecasting energy demands. These energy demand forecasts were compared to existing levels of energy use and generation to determine if regional energy prices are expected to increase significantly or if updates to the regional energy delivery systems are anticipated to be required.

This analysis includes identification and evaluation of the mission requirements for energy and the extent to which each installation component already meets these requirements. The analysis also evaluates whether the proposed project activities for each alternative would expand the specific

installation components’ demand for regional energy, and if any additional demand for energy or price increases for energy would adversely affect the proposed project or ROI. The following sections summarize the estimated proportionate increases in projected consumption of electricity, natural gas, and liquefied petroleum gas based on the proposed increases in training personnel for each alternative.

Steam facilities (boilers) have been decommissioned and, from mid-2009 forward, steam will no longer be used as a heat source at YTC (McDonald 2009f). Steam heating plants are not planned for the future energy needs at YTC; therefore, impacts to steam were not analyzed for any of the alternatives.

6.15.1 Resource-specific Significance Criteria

Factors considered in determining whether an alternative would have a significant impact on energy demand, generation, delivery systems, or costs would include the extent or degree to which its implementation would result in the following:

- Increased demand for energy beyond the current capacity of generation or delivery systems to the point that substantial expansion, additional facilities, or increased staffing levels would be necessary or result in substantial deterioration over current conditions.

6.15.2 Overview of Impacts to Energy Demand and Generation by Alternative

Table 6-32 summarizes the potential impacts on energy demand and generation that would occur under each of the alternatives.

Table 6-32 Summary of Potential Effects on Energy Demand and Generation at YTC

Activity Group	Alt 1	Alt 2	Alt 3	Alt 4
Construction Direct and Indirect Effects	•	€	€	€
Live-fire Training Direct and Indirect Effects	•	€	€	€
Maneuver Training Direct and Indirect Effects	•	€	€	€
Cumulative Effects	€	€	€	€

U = Significant Effects
 W = Significant but Mitigable to less than Significant Effects
 € = Less than Significant Effects
 + = Beneficial Effect
 N/A = Not Applicable
 • = No Effects

6.15.3 Alternative 1 — No Action Alternative

6.15.3.1 Construction Direct and Indirect Effects

6.15.3.1.1 No Effects

No cantonment area or range construction would occur under Alternative 1. Therefore, there would be no effects to energy demand or infrastructure. The existing energy infrastructure would be sufficient to support existing facilities.

6.15.3.2 Live-fire Training Direct and Indirect Effects

6.15.3.2.1 No Effects

Under Alternative 1, live-fire training would continue to be conducted at YTC at current levels. There would be no impact to energy demand for live-fire training and the existing energy infrastructure would be adequate to support the projected live-fire training under Alternative 1.

6.15.3.3 Maneuver Training Direct and Indirect Effects

6.15.3.3.1 No Effects

Under Alternative 1, the intensity and frequency of maneuver training at YTC would be similar to current conditions. During maneuver training, power generation is typically self-contained (generators) and does not tap into the existing power infrastructure. There would be no impact to energy demand for maneuver training as projected under Alternative 1.

6.15.4 Alternative 2 — GTA Actions

6.15.4.1 Construction Direct and Indirect Effects

6.15.4.1.1 Less than Significant Effects

Energy demand for this alternative would be similar to current conditions because the resident population at YTC would not change for this alternative and both proposed new ranges would be outdoor ranges that would have minimal demands for electricity, natural gas, or LPG. New Army facilities would incorporate energy conservation measures in facilities designs and these energy-saving features would likely offset some of the additional energy demand. Short-term energy demand would increase during construction of the new facilities; however, this impact would be temporary and less than significant. Impacts to energy demand and generation would be less than significant because the additional long-term energy demand for operation of the two new ranges would be inconsequential compared to system capacity and the new energy-saving features of the new ranges would likely offset some of the additional energy demand.

Ongoing and planned projects include improvements to the capacity and energy efficiency of the electrical transmission, natural gas systems, and heating at YTC. An initial capital investment may be required to extend the energy infrastructure to the new range facilities; however, it is unlikely that the capacity of the electrical and natural gas distribution systems would be exceeded. Over the long-term, the impacts to energy infrastructure within the ROI would be less than significant because these impacts would be limited to the Army installation.

During construction, power may need to be routed to the new facilities, and additional gas line connections or increased feeder line sizes may be needed to meet demands. Construction activities could result in service interruptions in order to connect new lines and extend service. This impact would be less than significant because service interruptions would be temporary, and the length of services interruptions would be minimized to the greatest extent possible. These impacts would be limited to the Army installation and service would be returned to normal after construction is completed.

6.15.4.2 Live-fire Training Direct and Indirect Effects

6.15.4.2.1 Less than Significant Effects

There would be an increase in energy demand because of increased use of the existing and two new live-fire training ranges; however, the energy demand for live-fire training would be similar to Alternative 1 because both new ranges would be outdoor ranges that would have minimal demands for energy. The new ranges would incorporate energy conservation measures and these energy-saving features would likely offset some of the additional energy demand. In addition, the Army would continue to implement SOPs for energy conservation to minimize energy demand. Impacts would be less than significant because the increased energy demand for live-fire training as projected

for this alternative would be within the capacity of the current generation and distribution systems (Army 2007e).

6.15.4.3 Maneuver Training Direct and Indirect Effects

6.15.4.3.1 Less than Significant Effects

Under Alternative 2, the overall frequency of maneuver training activities would increase by as much as 50 percent compared to Alternative 1. Impacts to energy demand and generation would be less than significant because maneuver training is generally self-contained and has little direct effect on the demand for energy.

6.15.5 Alternative 3 — GTA Actions + CSS Soldiers

6.15.5.1 Construction Direct and Indirect Effects

6.15.5.1.1 Less than Significant Effects

Energy impacts associated with construction would be the same as those described for Alternative 2 and would be less than significant because there would be no change in the resident population at YTC, the additional long-term energy demand for operation of the two new ranges would be inconsequential compared to system capacity, and the new energy-saving features of the two new ranges would likely offset some of the additional energy demand.

6.15.5.2 Live-fire Training Direct and Indirect Effects

6.15.5.2.1 Less than Significant Effects

There would be an increase in energy demand as a result of increased use of the existing and two new live-fire training ranges compared to Alternative 2; however, the energy demand for live-fire training would increase minimally and the new energy-saving features of the two proposed ranges would likely offset some of the additional energy demand. The Army would continue to implement SOPs for energy conservation to minimize energy demand. Impacts would be less than significant because the increased energy demand for live-fire training as projected for this alternative would be within the capacity of the current generation and distribution systems (Army 2007e).

6.15.5.3 Maneuver Training Direct and Indirect Effects

6.15.5.3.1 Less than Significant Effects

The addition of CSS logistics units to maneuver training activities at YTC would result in an increased number of personnel and vehicles involved in some maneuver training and an overall increase in the extent and intensity of maneuver training compared to Alternative 2. Impacts to energy demand and generation would be less than significant because maneuver training is generally self-contained and has little direct effect on the demand for energy.

6.15.6 Alternative 4 — GTA Actions + CSS Soldiers + Medium CAB

6.15.6.1 Construction Direct and Indirect Effects

6.15.6.1.1 Less than Significant Effects

Energy demand associated with construction would be the same as those described for Alternative 2. Energy demand impacts would be less than significant because there would be no change in the

resident population at YTC, the additional long-term energy demand for operation of the two new ranges would be inconsequential compared to system capacity, and the new energy-saving features of the two proposed ranges would likely offset some of the additional energy demand.

6.15.6.2 *Live-fire Training Direct and Indirect Effects*

6.15.6.2.1 *Less than Significant Effects*

There would be an increase in energy demand as a result of increased use of the existing and new live-fire training ranges compared to Alternative 3; however, the energy demand for live-fire training would increase minimally and the new energy-saving features of the two proposed ranges would likely offset some of the additional energy demand. The Army would continue to implement SOPs for energy conservation. Impacts would be less than significant because the increased energy demand for live-fire training as projected for this alternative would be within the capacity of the current generation and distribution systems (Army 2007e).

6.15.6.3 *Maneuver Training Direct and Indirect Effects*

6.15.6.3.1 *Less than Significant Effects*

The addition of a medium CAB to training activities at YTC under Alternative 4 would result in an increased number of personnel and vehicles involved in some maneuver training and an overall increase in the intensity of maneuver training compared to Alternative 3. Impacts to energy demand and generation would be less than significant because maneuver training is generally self-contained and has little direct effect on the demand for energy.

6.15.7 Cumulative Effects

6.15.7.1 *Less than Significant Effects*

Within the YTC regional area, past, present, and reasonably foreseeable increases in population and commercial development have cumulatively resulted in increased energy demand. Cumulative increases in energy demand from ongoing SBCT and other unit training at YTC would be insignificant in the context of increases in energy demand associated with regional population growth. In addition, Army policies and practices for minimizing energy consumption and ongoing renovation and construction that includes more energy-efficient heating systems would help to minimize the Army's contribution to this regional increase in energy demand. The existing energy availability and delivery infrastructure at YTC are more than adequate for the anticipated peak demands and could accommodate large increases in demand, if needed. Within the region, newly constructed housing and other facilities should incorporate technologies that would help reduce energy use and increasingly take advantage of renewable energy sources, resulting in a less than significant impact to energy demand and generation.

The addition of a third SBCT to the training activities at YTC, as well as GTA Soldiers, CSS Soldiers, and a medium CAB under Alternatives 2, 3, and 4, respectively, would increase the frequency of use of the existing facilities at YTC and result in a slight increase in energy demand. In addition, the medium CAB under Alternative 4 would increase the demand for adequate mobilization facilities and helicopter hangar and maintenance facilities at YTC. The training activities that occur at the ranges and training areas contribute little to energy demand. Anticipated increases in energy demand under the action alternatives, in combination with other training at YTC, would be insignificant in the context of increases in energy demand associated with projected regional population growth. In addition, Army policies and practices for minimizing energy consumption and

ongoing renovation and construction that include more energy-efficient heating and cooling systems would help to minimize the Army's contribution to this regional increase in energy demand.

6.15.8 Mitigation

YTC BMPs require that all new facilities be designed with energy-saving features and constructed to comply with AR 11–27, Army Energy Program; EO 13123, Greening the Government through Efficient Energy Management; EO 13423, Strengthening Federal Environmental, Energy, and Transportation Management; and the requirements under the new Energy Independence and Security Act of 2007. In addition, all new facilities would be constructed to achieve a minimum of Silver rating LEED including energy efficiency. The analysis of the direct, indirect, and cumulative effects for the four alternatives concludes that the effects on energy demand and generation are less than significant. Therefore, no new or additional mitigation is necessary to avoid, limit, repair, reduce, or compensate for the adverse effects.

6.16 UNAVOIDABLE ADVERSE EFFECTS

There are unavoidable impacts that could occur as a result of implementing any of the action alternatives. Some of these impacts would be short-term, while others could be long-term. These unavoidable impacts, which have been described in the EIS, could include:

- The generation of fugitive dust and other pollutants during construction and training activities that could impact air quality in the region (short-term).
- Loss of or harm to vegetation, especially on shrub-steppe habitat, as a result of training activities. Proposed resource sustainability management and mitigation measures should reduce the rate of loss of shrub-steppe habitats (short- and long-term).
- Loss of fish habitat as a result of soil erosion and sedimentation from construction and training activities, and from stream crossing activities during training. Efforts by YTC to enhance riparian habitat on the installation should offset these losses (short- and long-term).
- Loss of or harm to wildlife and wildlife habitat from construction and training activities. Shrub-steppe species and habitats are most likely to be affected (short- and long-term).
- Loss of or harm to special status species as a result of training activities. Species that are most likely to be affected include those found in the shrub-steppe habitats such as greater sage-grouse, burrowing owl and other raptors, and several species of migratory birds and small mammals (short- and long-term).
- Increased noise levels and disturbance from construction and training that could affect human aesthetics and wildlife use of the installation and nearby areas (short-term).
- Increased on-road and off-road traffic on YTC as a result of higher levels of activity by vehicles (short-term).
- Increased production of hazardous wastes as a result of construction and training. It is anticipated that higher levels of Stryker vehicle miles would result in a greater likelihood of petroleum and related spills from vehicles.

6.17 RELATIONSHIP BETWEEN SHORT-TERM USES AND LONG-TERM PRODUCTIVITY

Short-term uses are those that generally occur on a year-to-year basis. Examples are wildlife use of forage, rangeland management, recreation, and uses of water resources. Long-term productivity is the capability of the land to provide resources, both market and non-market, for future generations.

YTC has been used as a military installation since 1942. The military mission at YTC is to train, mobilize, and deploy combat-ready forces to fight and win throughout the world. The proximity of Fort Lewis and YTC to interconnected road, rail, sea, and air facilities makes them, together, the premier force deployment center on the West Coast of the United States. The vision of Fort Lewis and YTC is to be an enduring strategic installation that is ready to project combat power for decisive victory. Fort Lewis and YTC will also provide support for Soldiers, their Families, and the civilian workforce, and do what is necessary to sustain a quality installation. The mission will be accomplished by:

- Providing training areas with modern ranges and other support facilities that meet the needs of assigned and visiting units and tenant activities;
- Developing and maintaining state-of-the-art simulation facilities;
- Providing and maintaining world-class power projection facilities;
- Providing first-class living and working environments for the total force;
- Ensuring quality services that meet the continuing professional requirements of Soldiers and civilian employees and the personal needs of Soldiers, their Families, and other authorized individuals; and
- Demonstrating leadership and innovation in environmental stewardship.

At the same time, the Army's commitment to natural resources management is emphasized in AR 200-1 (Environmental Protection and Enhancement), which requires that INRMPs or CNRMPs be developed and maintained for all Army installations.

In this context, long-term impacts to site productivity would be those that last 75 to 100 years or more. Army actions would adversely affect long-term productivity by reducing the productivity of soil and vegetation and ability of shrub-steppe communities (and to a lesser extent other vegetation types) to provide quality habitats that support fish and wildlife. The Army has ongoing programs in place that restore and enhance upland and wetland habitats to slow this loss, but the gradual loss of soil and plant productivity and habitat quality appears inevitable, even with limits on training and other land disturbing activities.

From a regional perspective, however, the military mission has had numerous positive impacts on natural resources at YTC. The most significant is YTC's commitment to the protection and management of cultural and natural resources on the installation. Given the large amount of agricultural, residential, and commercial development occurring near YTC, and the importance of protecting and conserving natural and cultural resources within the region, the protection and management of these resources on the 327,231 acres (132,426 ha) that comprise YTC has become increasingly important.

There are approximately 241,000 acres (97,500 ha) of sagebrush-dominated plant communities on YTC. As noted above, YTC lies within the core of the largest remaining block of shrub-steppe habitat in Washington. The Army works to revegetate and rehabilitate areas that are damaged by training, and to control the spread of noxious weeds. Sagebrush restoration activities have included seeding with grasses and forbs and planting sagebrush seedlings.

The Army protects springs, seeps, and wetlands on YTC from military vehicles to reduce sedimentation caused by erosion. Several springs, seeps, and wetlands were used as livestock watering sites historically. The Army has been active in removing livestock watering troughs and other debris, and revegetating many of these sites. These activities have greatly benefited the fish and wildlife that use these wetlands, as well as recreational users of the installation.

YTC has taken numerous actions to benefit species of concern. The YTC Sage Grouse Management Plan directs management for sage-grouse and their habitat on YTC, including the protection of leks and nesting and brood rearing habitat. To benefit bald eagles, military activities are limited near bald eagle roost sites during winter, and YTC has conducted riparian tree plantings to provide future roost sites. The installation monitors raptor populations and protects raptor nest sites as they are found. Riparian habitat associated with several streams has been restored or enhanced to improve habitat for salmonids and other fish.

The goal of resource sustainability management is to tie training activity levels to the quality of the land and to slow or avoid the loss of soil and plant resources and the fish and wildlife that depend upon them. When combined with current efforts to manage resources on the installation, this management strategy should ensure that, as long as the Army strives to maintain and enhance its natural resources, YTC should continue to provide some of the most productive lands in the region.

6.18 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Irreversible resource commitments are those that cannot be reversed (loss of future options), except perhaps in the extremely long term. The term relates primarily to nonrenewable resources, such as minerals or cultural resources, or those resources that are renewable only over long periods of time such as old-growth forest. Irretrievable resource commitments are those that are lost for a period of time. For example, if shrub-steppe habitat is in poor condition and is likely to remain so, the time gap between its current and its ideal (potential) productivity is in itself an ongoing irretrievable loss.

The irreversible commitment of resources would include the consumption of non-renewable energy or materials, such as petroleum products used to operate Stryker vehicles, and sand, gravel, and rock materials used to maintain and construct roads on the installation that would be later unavailable for other uses. Eroded soil that is transported off the installation by storm water runoff and streams would also constitute an irretrievable loss.

Irretrievable resource commitments include the loss of vegetation and fish and wildlife habitat from construction and training activities. Ongoing and proposed mitigation and resource management would reduce these impacts, but the quality of vegetation and habitat is likely to be reduced if training levels remain high or increase.

Populations of special status species, especially those using shrub-steppe habitats, could be irreversibly and irretrievably affected by the action alternatives. The population of greater sage-grouse found on YTC is one of only two populations in Washington. Loss of these populations could have significant impacts on the future success of the species.

Table 6-33 YTC Best Management Practices Summary for Preferred Alternative, Record of Decision for Fort Lewis Army Growth and Force Structure Realignment

Resource Area (Mitigation Project Title)	Final EIS	
	Sections	Description of Mitigation
Soil Erosion	6.1	For any construction project requiring an EPP, implement the pertinent resource protection measures, including BMPs, that are part of the EPP.
Water Resources	6.2	
Wetlands	6.4	
Cultural Resources	6.6	
Air Quality	6.7	
Noise	6.8	
Hazardous Materials/Hazardous Waste	6.12	
Soil Erosion	6.1	For any construction project requiring a storm water pollution prevention plan (SWPPP), implement the pertinent resource protection measures, including BMPs, contained in the SWPPP. Government approval of the SWPPP is required prior to start of construction.
Water Resources	6.2	
Wetlands	6.4	
Cultural Resources	6.6	
Air Quality	6.7	
Noise	6.8	
Hazardous Materials/Hazardous Waste	6.12	
Soil Erosion	6.1	Continue to implement soil erosion mitigation and monitoring measures outlined in the YTC CNRMP/INRMP. These include, but are not limited to, the following: <ul style="list-style-type: none"> • demarcate areas that are naturally prone to soil erosion such as creek bottoms (YTC Land Use Zone 1); • minimize off-road maneuvers during periods of high soil moisture; • rest highly-utilized maneuver areas through training area rotations; • limit or exclude training in areas of steep slopes. • erosion control (e.g., erosion control blankets, loose rock structures, sediment traps and weirs) of highly erodible sites (e.g., unimproved roads, fire suppression lines, and intermittent channels) following disturbance.
Soil Erosion	6.1	Identify potentially erosive sites that may require altered management practices such as upgrading firebreaks with gravel and water bars, and reseeding areas such as bivouac sites, dig sites, and temporary firebreaks.
Soil Erosion	6.1	Continue to follow resource protection practices required by Fort Lewis Regulation 200-1, <i>Environmental Protection and Enhancement</i> , during field training, including but not limited to: <ul style="list-style-type: none"> • avoiding maneuver, digging, or establishing assembly areas or bivouac sites in Seibert staked areas; • using only established roads and trails during movement to and from maneuver areas and firing ranges; • crossing rivers/streams only at approved crossing sites; • staying at least 50 meters from rivers/streams, wetlands, or other water bodies unless a maintained road or designated crossing exists for traversing the restricted area; • conducting water purification training only at approved sites, and insuring that wastewater and excess product water is discharged to a dug sump at least 50 meters from the water source; • obtaining a permit for digging, and conducting digging only in the area specified in the permit; • locating assembly areas and bivouac sites at least 100 meters from any water body; • establishing field refueling sites, field maintenance sites, field kitchens and field showers at least 100
Water Resources	6.2	
Biological Resources (Aquatic Species)	6.3	
Wetlands	6.4	
Hazardous Material/Hazardous Waste	6.12	

Table 6-33 YTC Best Management Practices Summary for Preferred Alternative, Record of Decision for Fort Lewis Army Growth and Force Structure Realignment

Resource Area (Mitigation Project Title)	Final EIS Sections	Description of Mitigation
		<p>meters from any water body;</p> <ul style="list-style-type: none"> • if authorized the use of field latrines, establishing them at least 100 meters from any water body, and closing and marking them per FM 21-10, <i>Field Sanitation and Hygiene</i>; • conducting vehicle washing only at installation designated wash facilities; • establishing hazardous material storage sites at least 100 meters from any wetland or water body; and • following requirements for accumulating and managing hazardous waste, and insuring all hazardous waste is returned to the one stockyard for disposal.
Water Quality	6.2	Continue riparian restoration and watershed protection program. Riparian restoration will improve water quality through minimizing streambed and gully erosion and will aid in holding soils in place at stream crossings. Watershed protection will be achieved by using Seibert stakes to prohibit vehicle disturbance near streams, reducing sediment runoff to streams and wetlands.
Water Quality	6.2	Continue the practices of excluding certain type of (e.g., mounted maneuvers) training activities from sensitive areas, limiting activities near water bodies, and using inert environmentally friendly training rounds whenever possible.
Biological Resources (Vegetation and Wildlife)	6.3	<p>Continue to implement the requirements of Fort Lewis Regulation 420-5, <i>Procedures for the Protection of State and Federally Listed, Threatened, Endangered, Candidate Species, Species of Concern, and Designated Critical Habitat</i>:</p> <p><u>Bald Eagle</u></p> <ul style="list-style-type: none"> • from 8 December to 24 March, maintain a minimum flight altitude of 300 feet AGL on the Hanson Creek Route between coordinates GG 190875 and GG280842. Maintain a 1 km buffer to the north and south of Hanson Creek Road • from 8 December to 24 March, coordinate all flights along the Columbia River Route between coordinates KB830 and KB690 with the Rattlesnake Flight Following Facility. There is no minimum flight altitude restriction, but flights must maintain a 1 km buffer to the west of the railroad right-of-way along the Columbia River • from 8 December to 24 March, river crossing exercises are prohibited on the Priest Rapids Reservoir • from 8 December to 24 March, travel on Hanson Creek Road between coordinates GG180875 and GG280842 is prohibited without coordination and authorization from ENRD and Range Control • off-road vehicle traffic is prohibited in the Hanson Creek riparian zones <p><u>Golden Eagle</u></p> <ul style="list-style-type: none"> • maintain a 500 meter buffer between all military activities and nest sites • maintain a minimum of 300 feet AGL for overflights of nest sites • air traffic is prohibited below the rim of Selah Canyon between Badger Pocket Road (GG039731) and the I-82 Bridge (FG958740) <p><u>Sage Grouse</u></p> <ul style="list-style-type: none"> • from 2400 to 0900 during 1 March to 15 May unless an earlier date is specified, comply with restrictions on military training restrictions and other land use within a 1 km radius of designated leks • from 2400 to 0900 during 1 March to 15 May unless an earlier date is specified, aircraft overflights within a 1 km radius of designated leks are prohibited

Table 6-33 YTC Best Management Practices Summary for Preferred Alternative, Record of Decision for Fort Lewis Army Growth and Force Structure Realignment

Resource Area (Mitigation Project Title)	Final EIS Sections	Description of Mitigation
Biological Resources (Vegetation and Wildlife) (continued)	6.3	<p><u>Sage Grouse, continued</u></p> <ul style="list-style-type: none"> • all off-road military activities are prohibited between 1 March and 15 June (24 hours a day) within the sage grouse protection areas. Exceptions within these areas include the following existing Firing Ranges: 4, 5, 10, 10Z, 16, 26, and 55. Vehicle travel is limited to MSR's and/or designated roads to the above Firing Ranges • bivouacs are not permitted at any time of the year in the sage grouse protection area • excavations are only permitted in the protection area on existing firebreaks. All excavations within the sage grouse protection areas are coordinated through YTC ENRD, and carried out in accordance with the YTC dig permit process <p><u>Ferruginous Hawk</u></p> <ul style="list-style-type: none"> • military activity is prohibited within 500 meters of the nest sites • aircraft over-flights of all active nest sites will maintain a minimum of 1,000 feet AGL <p><u>Salmonids</u></p> <ul style="list-style-type: none"> • protection measures in place for riparian areas on YTC provide direct protection for these species, and protect habitat that may be occupied <p><u>Burrowing Owls</u></p> <ul style="list-style-type: none"> • known nest sites are protected by Seibert stakes <p><u>Columbia Milk-vetch, Basalt Daisy, Dwarf Evening-Primrose, Hoover's Desert Parsley, Hoover's Tauschia, Kalm's Lobelia, and White Etonella</u></p> <ul style="list-style-type: none"> • known populations are protected by Seibert stakes
Biological Resources (Wildlife)	6.3	Continue and expand the reach of the ITAM Sustainable Range Awareness Program.
Biological Resources (Vegetation and Wildlife)	6.3	Continue to conduct Sustainable Range Awareness training for all units training at YTC to educate them about the importance of minimizing the amount of damage caused to vegetation by off-road travel.
Wildfire Management	6.5	<p>BMP – Integrated Wildland Fire Management Plan Update</p> <p>Complete a comprehensive update of the IWFMP, either in-house or contractually. Complete annual reviews and updates thereafter.</p> <p>Complete 2010 comprehensive update with in-house resources. Complete annual reviews and annual fire summary report.</p>
Wildfire Management	6.5	<p>BMP – Integrate Wildland Fire Management Committees</p> <p>Establish Policy and Technical Committees that will oversee, update, and implement the IWFMP and monitoring and reporting of all fire related mitigation measures.</p> <p>Continue use of Fire Technical Team consisting of Wildland Fire Manager and at a minimum, one representative from DPW and DPTMS. Continue use of Fire Restoration Team Consisting at a minimum of the ITAM coordinator, one representative from DPW, and Wildland Fire Manager.</p>

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Resource Area (Mitigation Project Title)	Final EIS Sections	Description of Mitigation
Wildfire Management	6.5	<p>Continue use of Fire Policy Team and designate representatives.</p> <p>BMP - Awareness level training for Training Units</p> <p>Add wildland fire emphasis to the SRA brief, fire emphasis during unit scheduling and during the daily 1500 Range Brief. Develop outreach products (posters and other products).</p> <p>Recommend increasing education/awareness efforts at home station and during all local points of unit contact with variety of outreach methods/products.</p>
Wildfire Management	6.5	<p>BMP - Maximize YTC Fire Department Personnel down range.</p> <p>There is a need to maximize presence of YTC Fire Department Personnel down range (e.g., seasonal staff for roaming patrols, full time equivalent (FTE) positions to conduct training and issuing of equipment, increased number of seasonal staff, improved hiring practices, and adjust work schedules).</p> <p>Accept and implement proposed recommendations to maximize fire department personnel downrange according to identified fire risk.</p>
Wildfire Management	6.5	<p>BMP - Mutual Aid Practice Review</p> <p>Evaluate mutual aid practices and make adjustments to ensure adequate coverage is available at YTC during training activities.</p> <p>Retain current mutual aid agreements that allows for dedicated wildland fire suppression response on YTC and ability to obtain additional suppression assets if needed.</p>
Wildfire Management	6.5	<p>BMP - Accountability</p> <p>Seek alternate sources of funding that exceed fair wear and tear (e.g., bill units). Consistent enforcement of laws and regulations for acts of negligence.</p> <p>Utilize existing process for acquiring funds to address damage to equipment, structures, and resources as a result of negligence or disregard for established procedures, policies, or laws.</p>
Air Quality	6.7	<p>For each new construction project (Military Construction, Army [MCA] by the COE or military troop construction), evaluate need for air operating permit modifications based on final site selection and design prior to start of construction.</p>
Air Quality	6.7	<p>Implement BMPs for new permitted stationary sources of emissions, including BACT review for each criteria pollutant, MACT review for regulated HAPs and designated categories, and meeting the NSPS and NESHAP requirements.</p>
Air Quality	6.7	<p>Prior to the demolition or renovation of an existing structure,, a Notification of Demolition and Renovation application must be filed with the YRCAA and the appropriate fee paid.</p>
Air Quality	6.7	<p>Prior to the start of any demolition, excavation, clearing, construction, or landscaping work, contractors</p>

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Resource Area (Mitigation Project Title)	Final EIS	
	Sections	Description of Mitigation
		must file a Dust Control Plan with the YRCAA.
Air Quality	6.7	Conduct, in conjunction with YRCAA, an annual air quality inspection.
Air Quality	6.7	Air emissions associated with different levels of smoke training on YTC will not exceed the limits identified in the <i>Final Environmental Assessment for the Fielding of M56 and M58 Smoke Generators at Fort Lewis and Yakima Training Center</i> (Army 1999), and in the <i>Final Environmental Assessment for Training with Smoke Munitions at Fort Lewis and Yakima Training Center, Washington</i> (Army 2001a).
Air Quality	6.7	Quantities (numbers, gallons, or pounds) of smoke producing devices will stay within limits identified in previous environmental impact analyses.
Air Quality	6.7	Revegetate degraded areas to reduce the amount of dust produced during training exercises.
Noise	6.8	Implement the noise control plan from the EPP required for construction projects 1 acre in size or larger.
Noise	6.8	Continue implementing the Installation Operational Noise Management Plan, which includes noise complaint management.
Land Use Conflict/Compatibility	6.9	Continue updating management prescriptions in various land use planning and management programs to address greater levels of stationing and training uses.
Land Use Conflict/Compatibility	6.9	Continue the implementation of the GIS program and incorporation of the program into existing land management programs to increase the effectiveness of efforts to implement specific resource mitigation and monitoring requirements by reducing conflicts and redundancy among various programs.
Traffic and Transportation	6.10	The Army would continue to time the convoys traveling between Fort Lewis and YTC to avoid the primary rush hours of 0600 to 0900 and 1500 to 1700 on I-5 and I-405.
Hazardous Materials/Hazardous Waste	6.12	Prior to demolishing any structures, an asbestos survey must be done by a certified asbestos building inspector. Any asbestos found must be removed by a licensed asbestos abatement contractor prior to demolition. Disposal documentation must be provided to YTC.
Hazardous Materials/Hazardous Waste	6.12	Continue to follow all federal, state, Army and Fort Lewis regulations and programs for managing, storing, using, and disposing of hazardous materials and wastes.
Hazardous Materials/Hazardous Waste	6.12	Continue to implement the Integrated Solid Waste Management (ISWMP) Plan at the installation.
Hazardous Materials/Hazardous Waste	6.12	Continue to comply with YTC policies regarding hazardous materials inventory and hazardous materials procurement and turn-in (YTC Policy Statements #26, Hazardous Material Inventory, and # 35, Hazardous Materials Procurement and Turn-in). All YTC residents, tenants, and contractors are required to comply with these policies.
Hazardous Materials/Hazardous Waste	6.12	Continue to implement the following programs to manage hazardous materials and wastes at YTC: the Installation Restoration Program, MMRP, CC, pollution prevention plan, ICP, and PMP.
Hazardous Materials/Hazardous Wastes, Solid Wastes	6.12	Submit a required EPP for all construction projects 1 acre in size or larger. The EPP includes such things as a spill control plan, solid waste management plan, contaminant prevention plan, and a pesticide treatment plan.
Hazardous Materials/Hazardous Waste	6.12	Conduct more frequent waste pick up due to the increase in waste streams.
Hazardous Materials/Hazardous Waste	6.12	Maintain adequate hazardous waste management capabilities (e.g., staff, supplies, and equipment) to support current and increased requirements based on training load.
Airspace/Noise	6.13	The populated area west of Vagabond Army Heliport is not to be flown over. (per Fort Lewis Regulation

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Resource Area (Mitigation Project Title)	Final EIS Sections	Description of Mitigation
		350-31) (this should be changed to xx feet AGL in next revision of the regulation)
Facilities	6.14	New building and facilities would incorporate water and energy conservation measures in facilities designs to comply with AR 11–27, Army Energy Program; EO 13123, Greening the Government through Efficient Energy Management; EO 13423, Strengthening Federal Environmental, Energy, and Transportation Management; EO 13514, Federal Leadership in Environmental, Energy, and Economic Performance; and the requirements under the new Energy Independence and Security Act of 2007.
Energy Demand/Generation	6.15	Construct all new facilities to achieve a minimum LEED rating of Silver.
Energy Demand/Generation	6.15	Incorporate water and energy conservation measures in new building and facilities designs to comply with AR 11–27, Army Energy Program; EO 13123, Greening the Government through Efficient Energy Management; EO 13423, Strengthening Federal Environmental, Energy, and Transportation Management; EO 13514, Federal Leadership in Environmental, Energy, and Economic Performance; and the requirements under the new Energy Independence and Security Act of 2007.

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Table 6-34 YTC Mitigation Summary for Preferred Alternative, Record of Decision for Fort Lewis Army Growth and Force Structure Realignment

Resource Area (Mitigation Project Title)	Final EIS Sections	Description of Mitigation
Soil Erosion	6.1	Implement increased ITAM program maintenance of sustainable training lands. Actions will include rehabilitating vegetation impacted by vehicle maneuvers, bivouac, digging, and other training activities; Seibert stake protection of sensitive areas; and installation/repair of low water crossings in areas of riparian and wetland soils. Conduct increased sustainable range awareness training. Conduct increased frequency of soil condition monitoring and reporting.
Water Resources	6.2	
Biological Resources (Vegetation and Wildlife)	6.3	
Soil Erosion	6.1	Appropriate site rehabilitation (e.g., revegetation, restoration, erosion control, irrigation and landscaping) will be accomplished following all construction related projects to provide the appropriate vegetative community or landscaping/xeriscaping (including irrigation if necessary) to protect soil resources.
Soil Erosion	6.1	Modify the YTC CNRMP/INRMP to account for wind erosion, and implement requirements to include: <ul style="list-style-type: none"> • The Army will evaluate high use landing zones (e.g., ranges) to determine if site hardening is required to prevent excessive soil erosion at these sites. • At those landing zones where it is determined hardening is appropriate to reduce the effects of wind erosion caused by rotor wash, hover pads will be installed.
Water Quality	6.2	Appropriate site rehabilitation (e.g., revegetation, restoration, erosion control, irrigation and landscaping) will be accomplished following all construction related projects to provide the appropriate vegetative community or landscaping (including irrigation if necessary) to protect water resources.
Water Quality	6.2	Erosion control measures will be implemented to address sediment delivery to the Yakima and Columbia Rivers following fire events. This includes measures to re-establish vegetation in upland and riparian areas, and installation of erosion control devices such as excelsior blankets, straw wattles, and rock structures to reduce channel scouring.
Biological Resources	6.3	Realign Sage-grouse Habitat and Core Use Area Protection Boundaries To mitigate for reductions in available habitat and to protect areas consisting of core areas of sage-grouse use on YTC, realign sage-grouse habitat and core use area protection boundaries in Training Areas 7,8,10, 11, and 16 to incorporate sage-grouse use information not considered in the current management plan and to manage primary containment areas to early seral conditions within the current SGPA.
Biological Resources	6.3	Provide Appropriate Sage-grouse Lek Area Designation Protection To insure that leks receive the appropriate protection, provide a process to insure that newly discovered leks receive designated area protection and that leks which may have become inactive are managed to land allocation standards they are contained in. Provide designated area protection to two recently discovered leks in TA 16 and TA 8, and manage two inactive leks in TA 12 and TA 5 and one active lek in the CIA to the land allocation standards of the area they are in.

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Resource Area (Mitigation Project Title)	Final EIS Sections	Description of Mitigation
Biological Resources	6.3	Revise the Sage-grouse Management Plan Revise the sage-grouse management plan to incorporate new information and mitigation measures as part of the YTC INRMP revision.
Biological Resources	6.3	Revise Flight Restrictions Related to SGPA and Leks Extend existing flight restrictions to all new proposed SGPA and secondary sage-grouse habitat areas that contain a primary flight route and/or within 1 km of a lek receiving protection.
Biological Resources	6.3	Increase West Nile Virus Surveillance and Control To reduce the susceptibility of sage-grouse to West Nile Virus, continue the current cooperative surveillance program and increase control efforts at all man-made sources of mosquito breeding habitat to include newly proposed water suppression sources.
Biological Resources	6.3	Install Forb Restoration/Greenhouse Facilities To augment sage-grouse habitat restoration efforts, install/use previously acquired greenhouses and procure additional greenhouse/restoration supplies for annual forb growing.
Biological Resources	6.3	Implement a Genetic Augmentation Program Establish an agreement with the Washington Department of Fish and Wildlife (WDFW) to work cooperatively in implementing periodic genetic augmentation as described in the WDFW Sage-grouse Recovery Plan.
Biological Resources	6.3	Continue Participation in the Partnership and Provide Support of the SCWSSC Continue partnership with and support the SCWSSC to further the goals/objectives of the partnership which include sustaining military training, conserving sage-grouse, and maintaining sustainable rangeland resources.
Biological Resources	6.3	Establish a Candidate Conservation Agreement with the USFWS To ensure that YTC sage-grouse management efforts to preclude the species from further listing are acknowledged, work cooperatively with the USFWS in revising and include the YTC sage-grouse management plan in a Candidate Conservation Agreement with the USFWS.
Biological Resources	6.3	Explore ACUB and Candidate Conservation Agreement with Assurances for Off-Installation Mitigation To provide added assurances and as an incentive to land owners for sage-grouse and shrub-steppe conservation efforts, recommend that the SCWSSC explore the possibility of a Candidate Conservation Agreement with Assurances for private land owners within the Yakima Focal Area of the SCWSSC. Complete an ACUB feasibility assessment and develop ACUB proposals where appropriate to reduce encroachment issues pertaining to YTC.

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Resource Area (Mitigation Project Title)	Final EIS Sections	Description of Mitigation
Biological Resources	6.3	Recommend Development of a Regional Habitat Restoration/Protection Strategy To ensure that that management for sage-grouse and shrub-steppe extends beyond YTC boundaries at scales appropriate for management of this species and its habitat, explore the possibility of a Regional Restoration Strategy for all federal and state agencies within the Yakima Focal Area of the SCWSSC.
Biological Resources	6.3	Develop a Sage-grouse Predator Assessment and Management Plan To address the continuing impact of predation on production and survival of sage-grouse populations, assess the predation issues, habitat quality, predator management options, and develop a predator management plan (three-year phased one-time project).
Biological Resources	6.3	Fence Marking/Removal for protection of sage-grouse Fences have been documented as a source of sage-grouse mortality throughout YTC. To address this source of mortality, fences no longer required will be removed and fences that are required will be marked to increase their visibility to sage-grouse.
Biological Resources (Vegetation and Wildlife)	6.3	Appropriate site rehabilitation (e.g., revegetation, restoration, erosion control, irrigation and landscaping) will be accomplished following all construction related projects to provide the appropriate vegetative community or landscaping (including irrigation if necessary) to protect vegetation resources for the affected project area.
Biological Resources (Vegetation and Wildlife)	6.3	On recently restored sites, burned sites and locations where mitigation measures were employed, military training activities will be restricted until restoration and resource rehabilitation measures for the site are successful.
Land Use	6.3	Provide Additional Range Inspectors
Wildfire Management	6.5	To support current and increased training activities associated with GTA actions, establish a Tier 2 Installation Range Control organization that would provide Range Inspectors (with vehicles). The additional personnel would monitor and enforce land use policies and assist in controlling avoidable training impacts to natural resources by identifying policy violations (e.g., encroachment within Seibert staked areas, digging without a permit or digging in unauthorized areas, bivouacking in unauthorized areas, refueling within the protective buffer for water bodies, and violating installation wildland fire management policies).
Biological Resources	6.3	Continue to Implement the Training Land Recovery Program.
Wildfire Management	6.5	To meet resource (e.g., site repair and recovery) and land use objectives (e.g., sustainable military training) for sites that have been impacted by military training (e.g., fire and mechanical disturbance), continue to implement the Army's Training Land Recovery Program. At a minimum, restriction of ground disturbing activities for one complete growing season is needed to allow recovery of ground cover and to address soil erosion and water quality concerns.

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Resource Area (Mitigation Project Title)	Final EIS Sections	Description of Mitigation
Wildfire Management	6.5	Develop and Maintain Pre-Incident Plans. To improve efficiencies in fire prevention and suppression, develop and maintain Pre-Incident Plans for designated locations or activities (e.g., containment areas, fire exclusion areas, and high risk activities outside of containment areas). Plan components would include but not be limited to burn plans, firebreak plans, and pre-staging of fire suppression assets. The Plans would be implemented as a part of the IWFMP.
Wildfire Management	6.5	Conduct Periodic Review and Refinement of the Wildland Fire Risk Matrix. To assist in reducing the potential fire ignition caused by training related events, refine existing Wildland Fire Risk Matrix components and add new elements needed to include a “no-firing” decision in those instances when the adjective fire danger rating reaches Extreme. Following each fire season or as appropriate, conduct a review of the Matrix to incorporate new information and lessons learned.
Wildfire Management	6.5	Establish Wildland Fire Containment Areas. To more effectively contain and suppress fires within areas where recurring fires are expected (e.g., established ranges and impact/dud areas), establish prior to, and maintain throughout the fire season, containment areas where fires will be suppressed at minimal size within the containment area boundary.
Wildfire Management	6.5	Establish Fire Exclusion Areas. To protect high value resources (e.g., mature late seral shrub-steppe, sage grouse habitat, restoration sites, and riparian areas) and to allow restoration and rehabilitation to occur where applicable, establish fire exclusion areas on the installation that have increased fire prevention and suppression priority (e.g., land use constraints, enhanced prevention and suppression assets/capabilities). Fire exclusion areas would receive fire suppression priority when multiple fires occur simultaneously.
Wildfire Management	6.5	Implement Temporal Constraints and other training restrictions during the high fire danger period (15 May through 30 September). To reduce the risk of ignition during periods of highest potential for ignition and to minimize the occurrence of catastrophic fires, fires in exclusion areas, or fires leaving the installation, the YTC Commander (as the installation land manager) retains the authority to restrict or modify training seasonally, daily, and by training area/range or activity.
Wildfire Management	6.5	Increase Wildland Fire Staffing. Provide additional staff necessary to support wildland fire management requirements associated with current and increased training activities associated with GTA actions.

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Resource Area (Mitigation Project Title)	Final EIS Sections	Description of Mitigation
Wildfire Management	6.5	Provide Wildland Fire Suppression Equipment. To address the inadequacy of existing equipment to meet current requirements and projected pre-suppression and suppression requirements associated with increased GTA training activities, acquire needed equipment (e.g., weather station; pre-burn, suppression, safety, and communications equipment).
Wildfire Management	6.5	Continue Aerial Fire Suppression Capability. To ensure adequate fire suppression capability, particularly in areas of YTC where ground fire suppression is impractical (54 percent of YTC lands) or ineffective, continue to provide aerial fire bucket suppression capability (as described in the 2007 Modification of Aerial Fire Suppression Requirements EA) on an annual basis and pre-positioned prior to the fire season.
Wildfire Management	6.5	Develop Additional Water Resources for Fire Suppression. To address the lack of sufficient aerial fire suppression water resources (water storage or dip tanks at some existing sites, wells and storage tanks at new sites) to support current and increased training activities associated with GTA actions, develop 12 additional water resources in areas where they currently do not exist or where enhancement of existing water resources is required to enable a maximum 12 minute turn-around time across the installation.
Wildfire Management	6.5	Conduct Firebreak Update and Maintenance. To reduce fire related impacts from increased training associated with GTA actions that result in degraded mission capabilities and natural resource conditions, and to ensure the maximum effectiveness of firebreaks; continue recurring firebreak maintenance activities that include maintenance of existing firebreaks and periodic realignment or addition of new firebreaks to address evolving needs.
Wildfire Management	6.5	Conduct Site Restoration For Wildland Fire Impacts. To compensate for incremental annual loss or large scale fire impacts to habitat and to meet increased site restoration requirements associated with fire damage from GTA related training, prioritize and restore areas based on integration of fire history; designation of containment and fire exclusion areas; site potential; and past, present, and projected impacts. In addition, YTC will utilize pre-incident planning to identify threats to and measures for protection of restoration sites.
Cultural Resources	6.6	Archaeological re-evaluations of cultural sites that may be eligible for inclusion on National Register of Historic Places as specified by Section 106 of the National Historic Preservation Act. Approximately 100 sites per year for 5 years.
Air Quality	6.7	Appropriate site rehabilitation (e.g., revegetation, restoration, erosion control, irrigation, and landscaping) will be accomplished following all construction related projects to provide the appropriate vegetative community or landscaping (including irrigation if necessary) to protect air resources for the affected project area.

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