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Lower Basin Fuels Breaks
Environmental Assessment

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OR/WA Bureau of Land Management
Spokane, Border Field Office
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1. Introduction

Background

The Columbia River Basin covers the entire south-central portion of Washington. It is a wide, arid lowland between the Okanogan Highlands, the southern Cascade Range, and the Idaho Rockies, and continues through eastern Oregon and into northern Nevada. The lower basin of Washington is centered around the confluence of the Columbia and Snake Rivers near the Washington, Oregon border. Shrub-steppe is the native vegetation type, mostly dominated by sagebrush and bunchgrasses. The region has hot, dry summers, cool to cold winters, low mean annual relative humidity, low mean annual precipitation, and high winds. Fires in this climate and fuel type can often become wind driven and expand rapidly. Large wildfires have become common in the Horse Heaven Hills near Benton City, WA. The most recent large fire was the Hansen Road Fire that occurred in June of 2023, and burned just under 6,300 acres on both private and Bureau of Land Management (BLM)-administered lands. Fires greater than 300 acres are becoming more frequent in this area with seven occurring in the last 10 years. Only five fires occurred between 1992-2013 (NIFC 2023). The National Interagency Fire Center (NIFC) classifies any fire greater than 300 acres in shrub-steppe as a large incident. The McNary area, located to the east of Plymouth, WA, has recently seen a sharp increase in the number of fires with eight fires occurring in just the past two years. These fires were contained to smaller acreages, but there is abundant potential for large fire growth in this area of concern. This is evident from the Hat Rock Fire that occurred in 2023 just across the Columbia River in Oregon. This incident burnt just shy of 17,000 acres.

Fires in these areas are frequently contained using ‘dozer’ lines that run from the plateau above downward to the lowlands below causing resource damage and added safety risk for fire personnel because of the steep slopes of the area. Dozer lines can provide an avenue for invasive species to establish, increased soil erosion, or disturb archeological sites as the dozer’s blade removes the surface vegetation to construct fireline. In addition, there have been numerous entrapments and “close calls” during initial attack of fires in this area, The most recent incident was the Badger Fire in 2020, located in Badger Canyon. Four Benton County volunteer firefighters were entrapped by the fire when performing a burnout operation and a wind shift occurred. These incidents illustrate and reinforce the need to establish wildfire control features that reduce the spread of fire and result in fewer fires entering or leaving BLM-administered lands while reducing the safety risk for fire personnel and others, and public property.

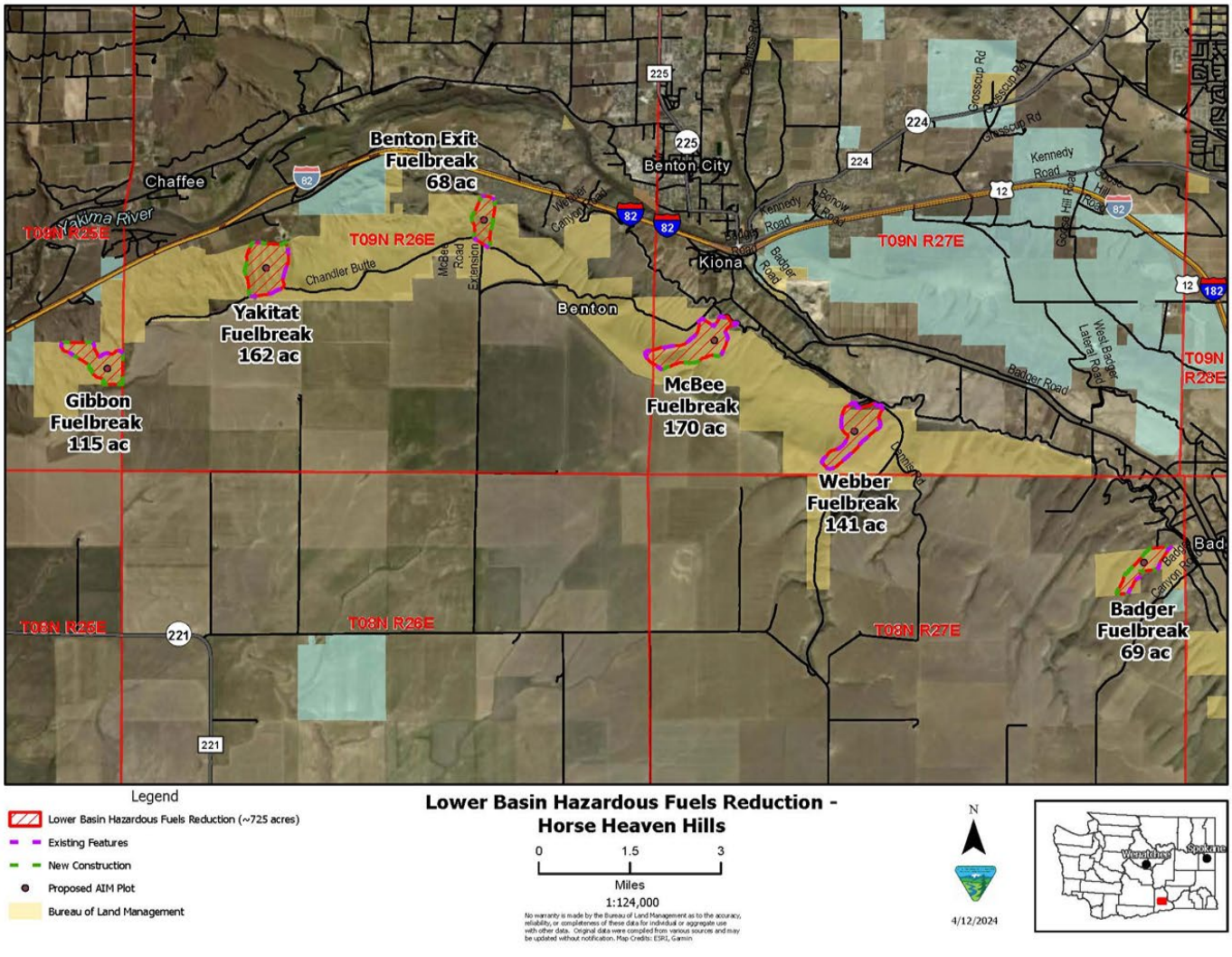
The BLM-administered lands, United States Army Corps of Engineers (USACE), Kennewick Irrigation District (KID), and private property proposed for this project are all located in Benton County, WA. These lands are within two separate Wildland-Urban Interface (WUI) areas. The WUI is The line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetation fuels (NWCG 2024). These WUI areas are referred to as the Benton City WUI and Plymouth, WA WUI. The two WUI areas are approximately 20 air miles away from each other, but both are along the Interstate 82 corridor. The WUI creates greater challenges and increased hazards to firefighters when suppressing emerging wildfires. These

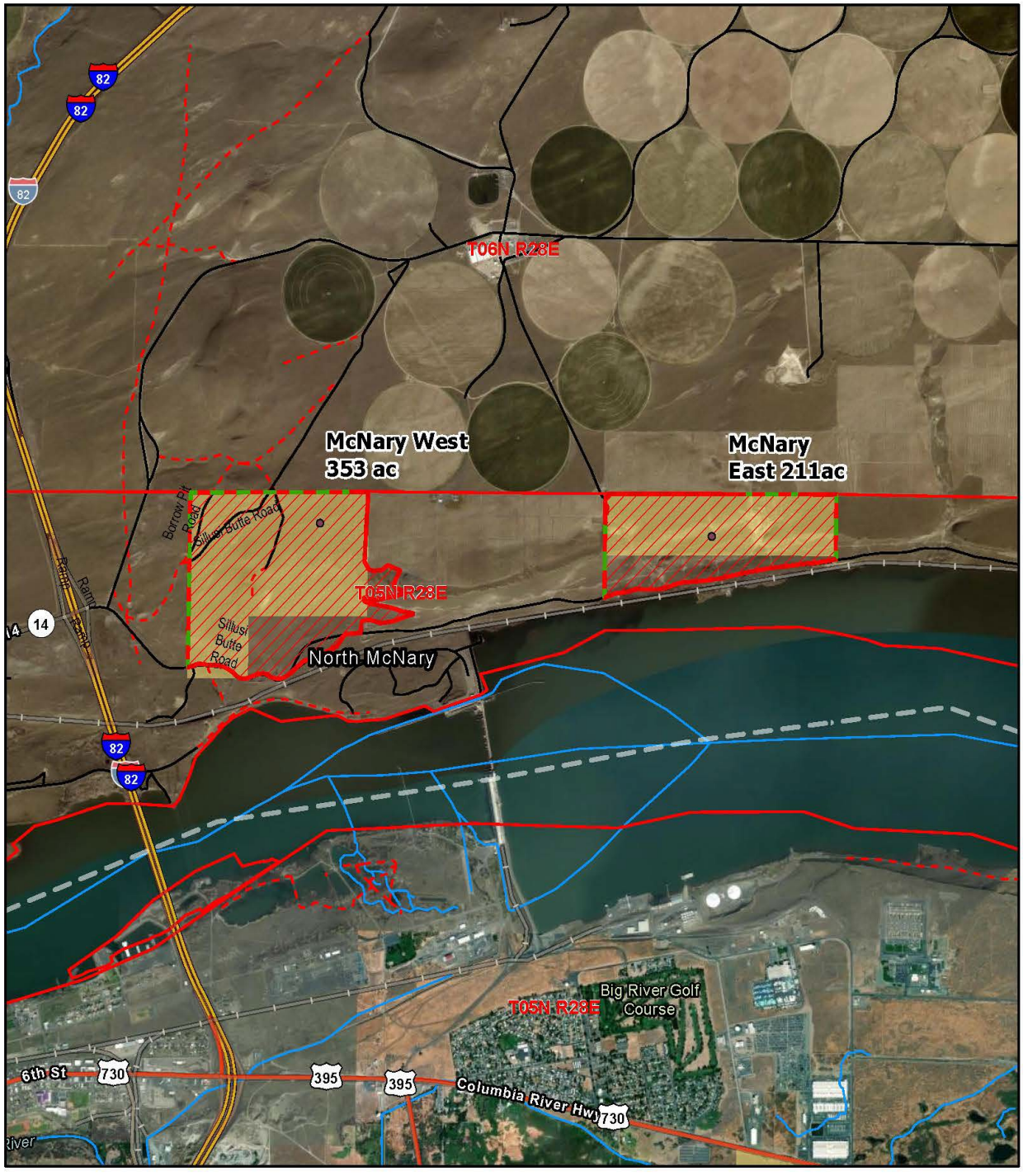
increased hazards also affect the public, as they may experience property damage from wildfires, might have to evacuate, or suffer from smoke impacts. Benton County has a completed a county wide assessment and is highlighted in their Benton County Community Wildfire Protection Plan (CWPP), chapter 4 (p.30) focuses on relative threat assessment. This document is available at:
https://www.dnr.wa.gov/publications/rp_burn_cwpp_benton_2018.pdf

More development is occurring on private lands in the lowlands adjacent to Horse Heaven Hills especially towards the eastern extent of BLM-administered lands. The southern perimeter of Horse Heaven Hills is encompassed by dry land agriculture fields. To the north and east of the McNary area also lie abundant agriculture fields. These fields include a mixture of irrigated pivots, orchards, and dry pasture. These are areas of concern to fire managers due to the westerly and southwesterly winds that prevail in these areas that would act to push fire towards the development and infrastructure or agricultural lands.

1.1. Project Area Location

The proposed project area is located in the following areas (shown below): McNary portion of this project area includes land in T. 5 N., R. 28 E., sections 2, 3, and 4., Willamette Meridian. The Horse Heaven Hills portion includes lands in T. 9 N., R. 25 E., section 25., T. 9 N., R. 26 E., sections 14, 20, and 23., T. 9 N., 27 E., sections 25, 30, 32, and 33., and T. 8 N., R. 27 E., Section 12 Willamette Meridian (Appendix H: Additional Maps).





Legend

- Lower Basin Fuel Breaks (~564 Acres Total)
- Existing Features
- New Construction
- Proposed AIM Plot
- Bureau of Land Management

Lower Basin Fuelbreaks - McNary

0 0.5 1

Miles

1:50,000

No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources and may be updated without notification. Map Credits: ESRI, Garmin

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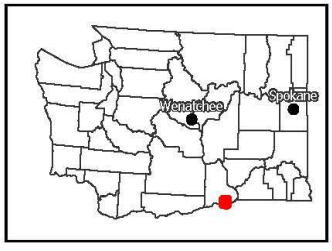

1.2. Purpose and Need for Action

The purpose for the project in the Lower Basin is to: create fuel breaks to reduce hazardous fuel loads and enhance effectiveness and safety of firefighting efforts within the Lower Basin's Wildland-Urban Interface (WUI) by:

- Creating defensible space through targeted vegetation management techniques to lower the risk of catastrophic wildfires; and
- Creating 8 fuel breaks positioned perpendicular to historic fire spread, leading to a 30% reduction in fire spread rates during wildfire events; and
- Protecting surrounding communities and vital infrastructure.

Need:
Actions to establish and maintain fuel breaks within the Lower Basin are needed as this area is at an elevated risk of wildfire due to high fuel loading and steep terrain. The proposed project areas are identified as a priority for wildfire mitigation due to the high relative threat assessment outlined by Chapter 4 of the Benton County Community Wildfire Protection Plan (CWPP). Current conditions that contribute to wildfire risk include dense, continuous brush and invasive grass species (e.g., cheatgrass) that facilitate fire spread. Steep terrain of the area complicates suppression efforts. Establishing fuel breaks is crucial for successful and safe firefighting operations.

1.3. Decisions to be Made

Based on the analysis contained in this Environmental Analysis (EA), the BLM will decide whether to approve or deny the proposed fuels treatments in the Horse Heaven Hills and McNary areas and if so, under what terms and conditions. Under the National Environmental Policy Act (NEPA), the BLM must determine if there are any significant environmental impacts associated with the Proposed Action warranting further analysis in an Environmental Impact Statement (EIS). The Field Manager is the responsible officer who will decide one of the following:

- To approve all of the proposed projects as described in the EA; or
- To approve only some of the proposed projects as described in the EA; or
- To approve some or all of the proposed projects and under what terms and conditions; or
- To deny all of the proposed projects.

1.4. Conformance with Land Use Plan

The BLM signed the Spokane Resource Management Plan (RMP) in 1987. The Lower Basin Fuels EA project would be in conformance with the ROD/RMP, which addresses how the BLM will follow applicable laws, regulations, and policies.

The RMP states that the BLM is concerned about two basic types of fires: wildfire and prescribed fire. All RMP alternatives introduce prescribed fires into the management system, but the method and frequency of use would depend on the management goal of each alternative. In Appendix C, the RMP states that a Fire Management Plan (FMP) is needed for all units (BLM ROD 1987, p. 63,160). The FMP, tiered to the RMP, provides the detailed direction within which the Spokane District's (SPD) Fire and Fuels Management program operates. The Spokane District Fire Management program is responsible for fire suppression and fuels management treatments on BLM lands across the state of Washington. Firefighter and public safety are the priority in every fire management activity, but the Spokane District FMP also takes into consideration resource values, public concern and safety, private, and/or public impacts and intermingled landownership (SPD FMP 2023). The Lower Basin Fuels project would align with the SPD FMP overarching objectives of the proposed action alternatives are to improve firefighter and public safety, reduce impacts to public and private lands, and reduce impacts to resource values.

1.5 Relationship to Laws, Regulations, and BLM Policies, Statues, Other NEPA Documents

Bipartisan Infrastructure Law (BIL): section 40803(j)(1) directs DOI and USDA to establish a Five-Year Wildfire Monitoring, Maintenance, and Treatment Plan that:

- Reduces severe fire risk on 10 million acres of Federal land, Tribal Forest lands, and rangeland that pose a high wildfire hazard, such as the Lower Basin.
- Develops a process for prioritizing treatments in areas and communities at the highest risk of catastrophic wildfire in direct partnership with state and local entities and affected stakeholders.
- Uses public-private partnerships; prioritizes projects that have been evaluated under the National Environmental Policy Act (NEPA) and are ready for implementation; streamlines additional projects based on existing statutory or regulatory authorities; and develops interagency teams to increase coordination and efficiency under NEPA.

Department of Interior Secretarial Order No. 3372 (Reducing Wildfire Risks on Department of the Interior Land Through Active Management): directs the BLM to "protect people, communities, wildlife habitat, and watersheds by actively managing lands to reduce the risk of catastrophic wildfire…they shall incorporate the use of any land and vegetation management techniques that are appropriate for the landscape, produce the desired results of reducing fuel loads, and are supported by the best available science" (DOI 2019).

Programmatic Environmental Impact Statement for Fuel Breaks in the Great Basin (Fuel Breaks EIS) (BLM 2020):
The Environmental Impact Statement (EIS) analyzes the same treatment types proposed in this EA, including prescribed fire, herbicide application, native seeding, targeted grazing, and adaptive management practices on areas that encompass the project area. While the proposed action alternatives do not primarily focus on these linear features, as detailed in Section 2.5 of the EIS, the environmental effects would be similar for the proposed Alternatives 2 and Alternative 2 with Targeted Grazing as they are similar actions to those analyzed in the EIS. The EIS analysis (presented in Chapter 4) and Project Design Features (PDFs) (included in Section 2.5.5) are included in this EA and incorporated by reference where applicable. This EIS will be referred to as the Fuel Breaks EIS henceforth in this document.

Spokane District Programmatic Noxious Weed & Invasive Plant Management Environmental Assessment (Spokane NIMP EA) (BLM 2018): This EA analyzes the same proposed treatments include, prescribed fire, herbicide application, native seeding, and targeted grazing across the entirety of the Spokane District. This analysis provides a more localized focus that is more project applicable compared to the EIS's listed above. Analysis and PDFs included in this EA are tiered to the Spokane District's Programmatic Noxious Weed & Invasive Plant Management Environmental Assessment, which is incorporated by reference and will be referred to as the Spokane NIMP EA henceforth in this document.

1.6 Public Input and Alternative and Issue Development

The BLM conducted internal scoping through internal Interdisciplinary Team (IDT) meetings. The IDT discussed initial issues and potential alternatives at these meetings, prior to developing the information for external scoping.

The BLM sent information for External Scoping to cooperating agencies, local stakeholders, and the general public. The BLM invited the United States Army Corps of Engineers (USACE) and the Kennewick Irrigation District (KID) to become cooperating agencies in the National Environmental Policy Act (NEPA) analysis,

because both entities have regulatory jurisdiction over portions of the project area. The BLM notified stakeholders (including individuals that live on the borders of the project area, businesses located near the project area borders, and landowners that have land within the project area) via letter.

On September 29, 2023, the BLM notified the general public that the Border Field Office was proposing to conduct hazardous fuels treatments via the BLM's ePlanning site. The BLM encouraged the public and stakeholders to review the scoping information and provide input on this proposal via the project webpage at https://eplanning.blm.gov/eplanning-ui/project/2026784/510, during the public scoping period (September 29, 2023, to October 13, 2023). The BLM received six comments through the ePlanning site. Comments received identified concerns with potential effects to native plants and rare species, wildlife forage, fuel break location, invasive species control, recreation enforcement, endangered species protection and the use of targeted grazing. These comments are identified in Appendix A, and are address in the analysis of the EA or directly in Appendix A.

Issues identified for analysis.

1. How would these treatments affect the fire behavior of wildfires within the project area?
2. How would the proposed herbicide treatments affect public safety (i.e., traditional use plants and the recreating public)?
3. How would the proposed treatments affect native plant communities, invasive plants including noxious weeds, biotic soil crust, and rare plants in the project area?
4. How would the proposed treatments affect grazing authorizations?
5. How would the proposed treatments affect recreational use during and after implementation?
6. How would the proposed treatments affect visual resource management (VRM)?
7. How would the proposed treatments affect cultural resources potentially eligible for listing to the National Register for Historical places?
8. How would the proposed treatments potentially affect fossil localities?
9. How would the proposed treatments affect soil resources?
10. How would project treatments and activities affect wildlife habitat for BLM sensitive species and migratory birds of conservation concern (BCC)?

2. Alternatives

This chapter describes the three alternatives the BLM analyzed in detail in this EA (including the No Action Alternative). It also describes the alternatives the BLM considered but did not analyze in detail.

2.1. Comparison of Alternatives

Table 1. Design features that vary between alternatives.

Alternative	***Prescribed Fire***	***Herbicide***	***Native Seeding***	***Adaptive Management***	***Targeted Gazing***
Alternative 1 No Action	No prescribed burning would occur, wildfire risk would remain the same under current conditions	No planned treatment under this EA but treatments under the Spokane NIMP EA could occur. Non-native and invasive species would persist	No native seeding would occur, native plant species would rely on natural regeneration to reestablish following disturbances	No adaptive management strategies would occur, natural processes would continue under current conditions	No targeted grazing would occur, wildfires would continue under current conditions

Alternative	*Prescribed Fire*	*Herbicide*	*Native Seeding*	*Adaptive Management*	*Targeted Gazing*
		under current conditions			
Alternative 2 Proposed Action	Prescribed fire would be utilized to reduce fine fuel loadings and break up continuous fuel beds to slow or stop the progress of wildfires	Herbicide treatments would be utilized to combat non-native and invasive species that can contribute to increased fuel loadings	Native seeding would occur to reestablish areas with low quantities of native species and naturally compete with non-native and invasive species	Adaptive management would be utilized to manipulate implementation strategies to achieve optimal results as conditions change over time	No targeted grazing would occur
Alternative 2 with Targeted Grazing	Prescribed fire would be utilized to reduce fine fuel loadings and break up continuous fuel beds	Herbicide treatments would be utilized to combat non-native and invasive species that can contribute to increased fuel loadings	Native seeding would occur to reestablish areas with low quantities of native species and naturally compete with non-native and invasive species	Adaptive management would be utilized to manipulate implementation strategies to achieve optimal results as conditions change over time	Targeted cattle grazing would occur on BLM administered lands within the proposed polygons to reduce vegetative fuel loadings and break up continuous fuel beds and biotically combat non-native and invasive species

2.2. Alternative 1 (No Action Alternative)

Under this alternative, the BLM would take no action to reduce hazardous fuels by implementing prescribed fire, herbicide application, native seeding, targeted grazing, or adaptive management practices in the project area as described in alternatives 2 and 3 at this time. The BLM will continue to manage weeds and invasive species on a district-wide level as described in the Spokane NIMP EA. The BLM will also continue to emphasize fire prevention and implement fire suppression. Unplanned ignitions would be extinguished as soon as possible under a full suppression strategy as identified in the 1987 Spokane District RMP and the 2023 Fire Management Plan.

2.3. Alternative 2 (Proposed Action)

The BLM would conduct hazardous fuels reduction utilizing prescribed fire treatments, herbicide treatments, native seeding, and adaptive management practices on 1,289 acres of BLM-administered land, private property, and other federal and local agency managed lands. Of the 1,289 proposed acres, 1,155 would be on BLM-administered lands, 112 acres on lands administered by the U.S. Army Corps of Engineers, on 21 acres under private ownership, and on 11 acres owned by the Kennewick Irrigation District. The individual fuel breaks range from 68 to 353 acres. These treatments would be implemented, as needed, to support the desired condition and effectiveness of the fuel breaks. The desired condition for the fuel breaks includes:

- Maintaining hazardous fuel loading below established thresholds (measured in tons per acre or (t/ac).
- Ensuring resistance to non-native and noxious weed invasion.

- Composing the breaks primarily of native plant species.

These criteria outline the specific goals for the fuel breaks and are explained in greater detail below.

Prescribed Fire

Prescribed fire treatments would be implemented when any individual fuel break has fuel loadings, measured in tons per acre, at or above the Grass Fuel Model 2 (GR2) fuel loading of 1.10 t/ac, as described in Standard Fire Behavior Fuel Models: A Comprehensive Set for Use with Rothermel's Surface Fire Spread Model (Scott and Burgan 2005). Prescribed fire would be used to initially establish or maintain fuel break effectiveness by consuming the small diameter fuel (< .25-inch diameter) that are present in these sites anytime between October 15th and March 15th when environmental conditions are within burn plan parameters. The fuel breaks would have a minimum of two years rest between burn prescribed fire intervals. After the two years of rest, the fine fuel loading within individual fuel break would be monitored as described under Adaptive Management and prescribed fire treatments would reoccur when the fine fuel loading exceeds 1.10 t/ac. The objective of the burn would be to reduce overall fuel loading (t/ac), reduce fuel heights, and breakup continuous fuel beds found in grass and grass-shrub fuel types. Appropriate firing patterns would be used to generate a short duration fire with low intensity to create a mosaic within the fuel breaks and consume surface fuels but not damage the root structures of the established native vegetation. Burn plans would be developed in accordance with guidance in the PMS-484 Interagency Prescribed Fire Planning and Implementation Procedures Guide (NWCG 2022) and follow all current BLM agency standards.

Fireline Construction - At a maximum, 41,448 feet (7.86 miles) of new handline would need to be constructed, including 29,551 feet (5.6 miles) in Horse Heaven Hills and 11,937 feet (2.3 miles) in McNary. New handlines would be constructed with hand tools on the perimeter of the prescribed fire areas. Hand tools would remove vegetation to bare mineral soil at a maximum of a 36-inch wide fireline. The berm would be pulled to the outside portion of the unit. A 100-foot-wide fuel modification or cutting with hand tools may be implemented around the perimeter of the burn in areas of critical holding concerns. These same techniques would be utilized, as needed, to improve existing features (roads, trails, previous dozer lines) that will serve as containment lines. These actions would reoccur within the same footprint, as needed, on each fuel break when the time comes to reimplement prescribed fire operations as described under Adaptive Management, see Appendix C for location of handline/established polygons.

Adaptive Management

A combination of Assessment, Inventory, and Monitoring (AIM) plot data and fuel loading calculations would be used to determine the fire return interval for each fuel break as described in Section 2.2.8 of the (BLM 2020). AIM plots will monitor soil and vegetation characteristics (Herrick et al. 2021). Outside of AIM monitoring, field office personnel will monitor other conditions such as burn severity, soil conditions such as hydrophobicity, as well as herbicide effectiveness, and planting success. All combined, this data would be used to determine the fuel thresholds that necessitates additional prescribed fire treatments. Monitoring of invasive grasses and/or non-native species would be implemented to determine the need for herbicide treatments and/or native seeding. Long-term monitoring would be conducted using AIM plots that would be established in or near the center of each proposed polygon. AIM plots consist of three, 25-meter long transects radiating from a central area and a soil pit dug within 5 meters of the center point. Soil pits are small, 50 cm (~1.5 ft) diameter pits dug with a shovel to a depth of 70 cm (~30 inches).

Herbicide Treatments

Herbicide treatments would include the use of imazapic for control of cheatgrass (*Bromus tectorum*). Imazapic would be applied in areas of 10 percent or greater cheatgrass cover and would be applied at rates between 2-12 fl oz per acre. Specific application rates would be determined by the product label to treat the targeted species at the time of application. Method of application would be primarily by aerial broad cast or backpack (i.e., hand applications) to reduce ground disturbance caused by wheeled vehicles in the Horse Heaven Hills. However, in the McNary fuel breaks applications may also be made by a tractor, UTV, or other ground vehicle due to flatter terrain. Imazapic treatments would be applied preemergent or during very early post emergence for cheatgrass,

which usually occurs in the fall and winter months. In the McNary parcels, clopyralid and/or aminopyralid would be used to control large areas of diffuse knapweed (*Centaurea diffusa*). These applications would be made in spring at rosette to early bolt stage and/or in the fall to rosettes. Aerial broadcast, broadcast by ground vehicle, and hand applications may be made. Application rates would be 5 – 7 oz/ac for aminopyralid and 0.6 – 1.33 pints per acre for clopyralid. Other spot applications or small (<1 ac) broadcast applications may be made to control other noxious weeds and invasive plants that may become established during this project. Herbicides and application rates for weed control would follow relevant design features and standard operating procedures from the Spokane NIMP EA.

Native Seeding

Seeding would occur in areas of bare ground (i.e., handlines) and in areas where perennial grasses are absent or in low abundance to reduce the invasion of noxious weeds and invasive plants and to maintain soil stability. Individual fuel breaks would be evaluated for seeding if they are below 25% canopy cover of native bunch grasses and/or <0.8 desirable species per square foot. Seeding would occur in the fall or winter months and be accomplished by aerial broadcast without mechanical incorporation in areas of steep slopes and rugged terrain. In areas of flat and rolling terrain a rangeland drill or UTV broadcaster may be used in conjunction with harrowing or rolling to incorporate the seed into the top 1/8 to ¼ inch of soil. Seeding of handlines would be accomplished by hand broadcast and hand raking. Seed would be broadcast at a rate of 20-25 pounds per acre, and the BLM would apply the seed mixes shown in Tables 2 and 3. Due to the important botanical resources in the Horse Heaven Hills, source identified biotypes would be preferred over the use of cultivars in this area.

Table 2. Native seed mix for use in the Horse Heaven Hills project areas

Common Name	**Latin Name**	**% of Mix**
Bluebunch wheatgrass	*Pseudoroegneria spicata*	50
Sandberg bluegrass	*Poa secunda*	30
Needle and thread	*Hesperostipa comata*	10
Thurber needlegrass	*Achnatherum thurberianum*	5
Native forbs*		5

Other native species may be substituted depending on costs and availability.

*Forbs appropriate to this site and that are commercially available include: common yarrow (*Achillea millefolium),* Carey's balsamroot *(Balsamorhiza careyana)*, Wyeth's buckwheat *(Eriogonum* heracleoides), Munro's globemallow (*Sphaerlcea m*unroana), large-fruited lomatium (*Lomatium macrocarpum*), shaggy fleabane (*Erigeron pumilus*), longleaf phlox (*Phlox longifolia*), slender hawksbeard (*Crepis atribarba*), and hoary tansyaster (*Machaeranthera canescens*).

Table 3. Native seed mix for use in the McNary project areas

Common Name	**Latin Name**	**% of Mix**
Indian ricegrass	*Achnatherum hymenoides*	30
needle and thread	*Hesperostipa comata*	30
Sandberg bluegrass	*Poa secunda*	20
sand dropseed	*Sporobolus cryptandrus*	15
native forbs*		5

Other native species may be added or substituted depending on costs and availability.

*Forbs appropriate to this site and that are commercially available include: common yarrow (*Achillea millefolium),* Carey's balsamroot *(Balsamorhiza careyana)*, Wyeth's buckwheat *(Eriogonum* heracleoides), Munro's globemallow (*Sphaerlcea*

*m*unroana), large-fruited lomatium (*Lomatium macrocarpum*), shaggy fleabane (*Erigeron pumilus*), longleaf phlox (*Phlox longifolia*), slender hawksbeard (*Crepis atribarba*), and hoary tansyaster (*Machaeranthera canescens*).

Interagency Fire Suppression Coordination

During implementation and upon completion and maintenance of the proposed fuel breaks, BLM would continue to communicate and coordinate best uses and tactics of initial attack resources with federal, state, and Benton County fire districts and their firefighting resources about the location and status of the fuel breaks. These interagency partners would also be invited to participate in the prescribed fire implementation as a training opportunity and to further build interagency relationships. This would allow for BLM's partners to have an in-depth understanding of the location and functionality of the fuel breaks once they are created to allow for faster, safer, and more effective wildfire responses.

2.4. Alternative 2 with Targeted Grazing

This alternative would include the proposed action plus an additional biological treatment method of targeted grazing with livestock. This targeted grazing treatment would be accomplished with cattle concentrated within the identified proposed action fuel break areas to accomplish the vegetative fuel reduction. Targeted grazing would be used before and/or after prescribed fire treatment actions at the discretion of the authorized officer to reduce warm season annual grass germination and to meet fuel break treatment objectives. Monitoring of livestock utilization would occur to assess t/ac remaining after targeted grazing. Targeted grazing would be used on BLM administered lands only, with or without a combination of treatments described in the proposed action (prescribed fire, seeding and herbicide), in areas 30% slope or less to reduce vegetative fuel loads. Cattle grazing is generally recommended on slopes of 30% or less. Steeper slopes can increase the risk of soil erosion and make it more challenging for cattle to graze safely. At slopes greater than 30%, the risk of soil compaction, erosion, and the difficulty of managing cattle increases significantly. Some studies and guidelines suggest that grazing should be avoided on slopes exceeding 20-25% to mitigate these risks effectively (Bohnert and Doye 2010). These criteria for targeted grazing areas would be met on 824 acres of the 1,155 acres of BLM lands identified in the proposed action.

Maps H.13 and H.14 in Appendix H show the targeted grazing slope accessible areas within the proposed action unit boundaries. For the purpose of this analysis, a feasibility scale was developed to rate the eight proposed fuel break areas in relation to acres available to cattle grazing. This scale considers the accessible acres to cattle grazing and the location access to provide water through a temporary water trough and truck without overland travel. A good rating is identified in fuel break locations where the majority of the topography within the polygon is less than 30% slope **and** has good road access to provide water. Table 4 below describes the locations feasible to implement the targeted grazing treatment method. The three locations identified with *good* feasibility using the proposed action fuel breaks are Badger, McNary West, and McNary East. Two fuel breaks, McBee and Webber, have a *fair* feasibility rating. The three fuel breaks that would not be feasible to implement this method are Gibbon, Yakitat, and Benton Exit. Considerations also would need to be made for a manner to control cattle within the targeted fuel break area. This would be accomplished through use of temporary fencing (i.e. electric fencing). Virtual fencing is becoming more prevalent in livestock control; however, it would be at a considerable monetary cost. For the purposes of this project, the BLM would be utilizing temporary electric fencing.

Table 4. Targeted Grazing Feasibility. *

Fuel Break Name	***Fuel Break Total Acres***	***BLM Acres Accessible to TG (≤ 30% slope)***	***Percent Fuel Break Area For TG***	***Water Haul Feasibility (road access)***	***TG Feasibility Rating (Good, Fair, Poor)***	***TG Feasibility Rationale***

Gibbon	115	98	85%	No	Poor	No road access for watering.
Yakitat	161	46	29%	Yes	Poor	Low percentage of fuel break area in relation to water location.
Benton *Exit*	68	29	43%	Yes, only at ridge	Poor	Low percentage of fuel break area in relation to water location. Topography and water haul locations would require intense herding.
Mcbee	166	118	71%	Yes, only in area of trail head	Fair	Trail head, recreational disturbance/proximity/VRM concerns grazing. Natural Area concerns. TG timing is outside of recreational SRP event.
Webber	130	103	80%	Yes, through private land	Fair	Water location is topographically separated by a ridge for the majority area of TG available area. Intense herding.
Badger	69	64	93%	Yes, only at boundary	Good	Large percentage of TG accessible area and good temporary water location.
Mcnary West	281	235	84%	Yes	Good	Surrounding private ownership. Roads accessible for watering with permissions. Current cattle authorization.
Mcnary East	155	131	85%	Yes, through private land	Good	Surrounding private ownership. Roads accessible for watering with permissions. Current cattle authorization.

* Targeted Grazing (TG) feasibility for the proposed action fuel break areas within the Horse Heaven Hills and McNary project area. Feasibility was rated by considering BLM acres less than 30% slope within the boundary of the proposed action compared to the fuel break total acres and temporary water haul access.

Targeted Grazing

BLM would retain the ability to cease use of the targeted grazing tool at any time if BLM determines it is not effective or desirable for any reason.

Authorization: A grazing decision would be issued to allow for the authorization of targeted grazing annually for up to a ten-year duration. A 'Free Use Permit' is addressed in 43 CFR § 4130.5, which states:

> *(a) A free-use grazing permit shall be issued to any applicant whose residence is adjacent to public lands within grazing districts and who needs these public lands to support those domestic livestock owned by the applicant whose products or work are used directly and exclusively by the applicant and his family. The issuance of free-use grazing permits is subject to Sec. 4130.1-2. These permits shall be issued on an annual basis. These permits cannot be transferred or assigned. (b) The authorized officer may also authorize free use under the following circumstances: (1) The primary objective of authorized grazing use or conservation use is the management of vegetation to meet resource objectives other than the production of livestock forage and such use is in conformance with the requirements of this part; (2) The primary purpose of grazing use is for scientific research or administrative studies; or (3) The primary purpose of grazing use is the control of noxious weeds.*

Grazing Season of Use: Strategic, high intensity, short duration targeted grazing would occur between October 15th to March 15th to reduce fine fuel loads for the upcoming fire season. This would allow for avoidance of

interrupting special recreational permitted events (SRPs) that annually occur before or after these dates. Because the climatic variation from year to year is unpredictable, the actual timing of targeted grazing would primarily depend on the amount of snow in the project areas. Substantial data collection would accompany the grazing treatments which would be administered through free-use grazing permit (43 CFR §4130.5). Annual production of fuel loads would determine when livestock grazing could begin. Fall and Spring grazing may be used, as needed, to assist in residual fuel reduction to further reduce fine fuel loads in areas where tons per acre are at or above the fuel loadings of a Grass Fuel Model 2 (1.10t/ac). Since cheatgrass has been shown to germinate readily in residual fall litter, fall grazing would reduce litter, further reducing germination of cheatgrass (Launchbaugh, et al., 2008; Schmelzer, et al 2014, Foster, et al., 2015). Grazing in the springtime would begin when cheatgrass or introduced species were still palatable to livestock, prior to the dough stage (Vallentine & Stevens, 1994) and prior to peak native growth. The avoidance of the growing season for desired native vegetation would allow for seed production and recruitment.

1. Livestock Numbers**:** treatments would be implemented with high intensity short duration grazing. Annually, when free-use grazing permits are authorized, they will include the kind and number of livestock, the period use, and the amount of use in Animal Unit Months (AUM). These terms and conditions would be based on annual conditions and may change with each free-use grazing permit issuance, as appropriate for the annual fuel growth and conditions of that given year. For the purpose of scientific research or administrative studies, free-use grazing permits, as defined in 43 CFR §4130.5, would be issued annually to provide fluidity to attain the fuel model objective, at the appropriate time, solely on treatment areas. Removal of livestock will be dictated by the fuel model objective being met.
2. Livestock Control:
    a. Temporary fencing would be used to confine livestock and to achieve grazing objectives in the proposed action fuel break areas accessible to targeted grazing. The fences would be electric (hot-wire) or virtual. Portable, temporary towers or base stations for virtual fences would be located next to existing roadways or trails. Livestock operators would be responsible for livestock control and management.
    b. Livestock Movements: If more than one fuel break area is identified for treatment, herding would be done with identified routes avoiding sensitive areas. Livestock would not be allowed to graze outside of the identified proposed action fuel break areas.
    c. Turn-out locations: Livestock turn-out locations will most likely be at water haul locations, but not limited to these.
3. Livestock Watering: Water hauling to temporary, portable troughs would be used to manage livestock distribution and meet fuels management objectives. Watering locations would be placed next to existing roadways or trails or previously disturbed areas (Maps H.13 and H.14 in Appendix H). Roads maintained by BLM may not be improved for this project unless authorized by the BLM. Water troughs must have wildlife escape ramps and troughs would be removed within 72 hours of livestock removal from the targeted grazing treatment areas. Troughs would be placed more than twenty feet from fences to prevent flying animal strikes. Troughs will be excluded within 50 meters of areas with known archeological sites.
4. Other Kinds of Livestock: The primary biological fuels removal method would be, but not limited to, cattle. The BLM parcels that contain the proposed fuel break areas have current cattle authorizations and/or applicants for cattle grazing. Other kind of livestock could be considered for fine fuel and biomass removal. This project is being designed to reduce fire intensity and fire behavior cattle as a biological tool for biomass removal. Using cattle for targeted grazing can be particularly advantageous over goats or sheep for several reasons related to their grazing behavior, ecosystem impact, and management flexibility.
5. Livestock Removal: Upon attainment of targeted grazing objectives for the treatment area, livestock will be removed within 48 hours of the BLM notifying the operator. No motorized herding or vehicle travel off designated routes will be authorized.

Exclusion of livestock from treatment areas with seeding may be necessary for the recovery of existing vegetation or establishment and protection of new seedings. Resumption of livestock grazing would ultimately depend on monitoring and meeting of seeding and recovery objectives. When fall prescribed burning treatment occurs, livestock grazing may be considered to reduce annual grass emergence during flushes of winter annuals before the perennial primary season of growth. Recovery of the treated area would be monitored for availability to grazing on a yearly basis. The monitoring for grazing availability and recommendations for opening the area to livestock would be the responsibility of an interdisciplinary team. If necessary, permitted use may be suspended in whole or in part on a temporary basis due to drought, fire, or other natural causes, or to facilitate installation, maintenance, or modification of range improvements (43CFR §4130.3-2(f).

The treatment areas would be considered recovered and available for grazing when the following objectives are met:

1. The amount of bare mineral soil (lacking cover of plants, litter, or biological soil crust) is within 10% of what would be expected for the site. Recommended study methods include line-point intercept or step point cover methods and photo points.
2. Desirable herbaceous perennial plants are producing seed.
3. Desirable perennial vegetation has developed a root structure that provides for soil stabilization.

A qualitative visual assessment of the following would also be considered:

- Plant vigor (perennial plants).
- Precipitation information during the non-growing (winter) and growing (spring through early summer) seasons.
- Competition with invasive annual plants and noxious weed species.
- Seed production.

An evaluation of collected monitoring data would be completed documenting that reintroducing grazing to the area would not cause a downward trend in vegetation establishment and recovery.

2.5. Alternatives Considered but Eliminated from Detailed Analysis

Targeted Grazing Only

Targeted grazing alone may not adequately fulfill the purpose of reducing hazardous fuel loads, creating effective fuel breaks, and enhancing firefighting efforts in the Lower Basin Wildland-Urban Interface (WUI). While targeted grazing can effectively manage vegetation and reduce certain fuel loads, it often falls short in addressing the complexities of landscape-level fire management necessary to safeguard communities and infrastructure. Research indicates that relying solely on grazing may not substantially lower the risk of catastrophic wildfires, particularly in areas with dense, continuous brush and invasive species like cheatgrass, which can rapidly reinvade (Teague et al.2011; Pastick et al. 2021). Moreover, targeted grazing does not inherently create the structural changes necessary for a significant reduction in fire spread rates, as it may fail to disrupt the continuity of fuels sufficiently to achieve the desired 30% decrease in fire spread during wildfire events (Fletcher et al. 2017). Additionally, grazing in steep terrain poses challenges, as livestock may become concentrated in areas that exacerbate soil erosion and fuel continuity, further complicating vegetation management efforts (Briske et al. 2014). Given these limitations, a more comprehensive approach, integrating multiple vegetation management techniques alongside grazing, is essential for effectively mitigating wildfire risks in the Lower Basin.

Green/Brown Strip Fuel Breaks

These treatments and strategies have been highlighted in the Fuel Breaks EIS. The general approach for a green strip is to remove the present vegetation via mechanical, chemical, or prescribed fire treatments to a desirable level for planting. This may require multiple treatments, but once the site is ready for planting, it is planted with

perennial plant species that retain moisture later into the growing season. These strips may require follow-up treatments as well to maintain desired characteristics. Brown strips utilize mowing to reduce fuel height, which in turn, results in lower flame lengths. However, these treatments are generally implemented along linear features such as roads or fence lines. There is an opportunity to implement these type of fuel breaks in some areas of the proposed project, but they are limited due to the topography, as well as the proximity to structures and agriculture adjacent to the area. The topography makes the use of machinery to mechanically treat or spray impractical. Additionally due to topography, there would be no feasible way to incorporate the new seed into the soil and would result in the seed not germinating in all areas. Also, the soil disturbance from harrowing or chaining the seed into the soil would break up the beneficial biological crust present. This crust protects against the invasion of nonnative plant species such as cheatgrass (Bromus tectorum) (Pyke 2015). Without adequate ground cover, increased erosion would occur, in turn leading to increased resource damage. Aerial chemical treatments could be used, but due to required buffers of up to 1/4 of a mile from houses and waterways; these treatments would not be able to achieve an effective area of coverage. A further drawback to green strips is that although these perennial plant species would hold moisture longer into the growing season, they would not hold moisture all year long. With many of the fires occurring within the project area in the late summer or fall, these green strips would still be dry and not act as an effective fuel break. The required level of maintenance and cost requirements to adequately facilitate the implementation of these fuel breaks; along with the limited opportunities for implementation due to topography make this a less effective fuel break option for this project area. Due to these factors resulting in very limited opportunities for feasible implementation within the project area, this option does not meet the purpose and need.

Fuel Breaks Along Linear Features

Linear features, such as roads, water ways, and utilities corridors, are commonly assessed features to be utilized to stop the progression of a fire. This is because these features are devoid of vegetation, in the case of roads and water ways, or are maintained on a more regular basis compared to natural vegetation in the case of utilities corridors. This maintenance could include brush removal for access, herbicide treatments for weeds, and there is often some sort of access road for service maintenance in these areas. Linear features can also be improved upon to increase their probability of holding as containment lines. These improvements could include mowing of adjacent fuels to reduce fuel loading and fuel heights, herbicide treatments to reduce the abundance of invasive species and weeds, or “black lining” them. Black lining would involve burning the vegetation up to 50 feet from the shoulder of the roadbed to buffer the road. With this alternative, the BLM would conduct aerial herbicide treatments of 100 feet on either side of any designated linear feature, if it is on BLM administrated lands and meets the criteria of a Categorical Exclusion (CX). The downside to linear features can be their location or how they align with the topography around them. There may be a great linear feature that can serve as a holding feature present on the landscape, and it may need little to no improvements, but if it is miles away from the fire’s origin and is not a viable tactical option for fire suppression. In other cases, there are none present; the McNary East area of this project has no linear features that meet these criteria. Also, along these lines, man-made linear features like roads or utilities corridors are constructed to serve a purpose and not designed as a fuel break. Many of the roads in this project area are in unsuitable locations to serve as desirable fuel breaks. Many are mid-slope roads or are in parallel with the predominate west or southwest winds of the area. The parallel roads help to limit lateral fire spread and can serve as a good anchor point from which to construct fireline, but do not provide much in the way of stopping forward fire progression. Mid-slope roads can be used in certain conditions and areas, but this is very situationally dependent. Mid-slope roads, such as the McBee Grade, are problematic because there can be unburnt fuel above the road that is susceptible to flame and heat impingement or spotting from the fire below the road. This can make these features very unsafe for firefighting resources, especially in the “light, flashy” fuels of the project area that can progress rapidly when moving upslope or when these fires become wind driven. Due to the combination of these factors and the limited number of suitable linear features in this project area, this does not meet the purpose and need.

3. Affected Environment and Environmental Consequences

This chapter describes the affected environment and the environmental consequences of the alternatives discussed in Chapter 2, as they related to the issues identified for detailed analysis. The BLM has combined the affected environment and the environmental consequence into this single chapter to provide all of the relevant information on an issue in a single discussion.

3.1. Issue 1 – How would these treatments affect the fire behavior of wildfires within the project area?

Affected Environment

The location of the proposed project in the Benton County area has been impacted by numerous large wildland fires. Twelve different fires of 300 acres or more have burned since 1992, with seven of those twelve occurring within the last ten years (NIFC 2023). This fire ignition data suggests and supports that fires are becoming more frequent and larger in size, and this is assumed to continue due to population growth and climate change. Climate change can contribute to more frequent and larger fires through observed hotter and dryer weather conditions, longer fire seasons, changes in vegetation, or changes precipitation patterns (USDA 2023). These individual factors would affect individual regions or sites differently. Compared to 2021, 2022 had roughly 10,000 more wildfire incidents which consumed roughly 452,000 more acres nationally. The rolling 10-year average continues to rise in both number of fires and acres consumed nationally (NICC 2022). The affected environment would not only be the 1289 acres included in the proposed action, but indirectly the surrounding land in all directions within a reasonable distance that a wildfire could burn. Due to adjacent landownership and land uses, it is unlikely that any large-scale projects to reduce hazardous fuels or establish fuel breaks would occur outside of what is proposed in this action. This is due to the proximity of the project to adjacent agriculture lands and the continued urban sprawl and development of private lands in the area. Table 5 shows the current fuel models and their acreages observed in each fuel break of the project. Table 6 is a description of the fuel models included in Table 5.

Table 5. Fuel model distribution per fuel break.

Fuel break Name	Total Acres	Acres of GR 1	Percent Acreage	Acres of GR 2	Percent Acreage	Acres of GS 2	Percent Acreage	Acres of NB 9	Percent Acreage	Notes
Gibbon	115	17	15%	98	85%	0	0%	0	0%	GR 1 portion of fuel break burned in 2023
Yakitat	162	162	100%	0	0%	0	0%	0	0%	Entire fuel break burned in 2023
Benton Exit	68	68	100%	0	0%	0	0%	0	0%	Entire fuel break burned in 2023
McBee	170	170	100%	0	0%	0	0%	0	0%	Entire fuel break burned in 2023
Webber	141	140	99%	1	1%	0	0%	0	0%	All but 1 acre was burned in 2023
Badger	69	5	7%	55	80%	9	13%	0	0%	GS 2 found mostly in draws. GR 1 found in patches on east aspects
McNary West	353	277	78%	74	21%	0	0%	3	1%	NB 9 present due to rock outcroppings. 240 acres of GR1 area burned in 2023
McNary East	211	36	17%	108	51%	58	27%	10	5%	NB 9 due to sand dunes and roads. GR 1 area burned in 2023

Fuel model acreage and percent acreage included for each proposed fuel break.

Table 6. Description of fuel models included in table 5 and their fine fuel loading t/ac (Scott and Burgan 2005).

Fuel Model	Fuel Model Type	Fine Fuel Loading t/ac	Description
GR 1	Grass	0.40	The primary carrier of fire in GR1 is sparse grass, though small amounts of fine dead fuel may be present. The grass in GR1 is generally short, either naturally or by grazing, and may be sparse or discontinuous.
GR 2	Grass	1.10	The primary carrier of fire in GR2 is grass, though small amounts of fine dead fuel may be present. Load is greater than GR1, and fuel bed may be more continuous. Shrubs, if present, do not affect fire behavior.
GS 2	Grass-Shrub	2.10	The primary carrier of fire in GS2 is grass and shrubs combined. Shrubs are 1 to 3 feet high; grass load is moderate.
NB 9	Non-burnable	0.0	Land devoid of enough fuel to support wildland fire spread is covered by fuel model NB9. Such areas may include gravel pits, arid deserts with little vegetation, sand dunes, rock outcroppings, beaches, and so forth.

Environmental Effects

No Action Alternative

No treatment activities would occur as stated in the proposed action alternatives of this document. There would be no direct effect, the BLM and its interagency fire partners would continue to promote fire safety and prevention as well as continue to strive for improvements in fire suppression tactics and strategies. Fires will continue to be suppressed with similar tactics to those currently being utilized with heavy equipment and firefighting aircraft. Over time new firefighting resources may create new opportunities for a change in tactics. However, at the time of analysis, there are no known changes or additions expected to occur in the near future.

It can be expected that the current frequency of fires would continue, as described in the Affected Environment section above, or potentially become more frequent over time given current trends. It can also be expected that within the affected areas of these potential wildfires that vegetation would continue to degrade. With degradation, these areas would become less suitable for certain wildlife species resulting in a net loss of biodiversity due to the repetitive burning by the frequent wildfires experienced within the project area. With a decline in established native vegetation, there would be a greater concern of soil erosion and invasion of non-native and invasive species to the area. The possibility of damages to both public and private property and associated infrastructure is greater compared to the other proposed alternatives. These concerns and negative outcomes would likely increase or worsen over time given no action.

Alternative 2 - Proposed Action

1. Initial prescribed burning of shrub-steppe vegetation in fuel breaks between October 15 and March 15 (1289 ac). As well as the repeated burning of fuel break when conditions exceed fuel model GR2 (assumed to occur every 3 years).
2. Both pre- and post-emergent herbicide applications to control and mitigate invasive and non-native plant species.
3. Seeding of native grasses and forbs.
4. Adaptive management practices.

To determine whether these treatments would be effective, would depend on how drastically they would be able to manipulate the present fuel model and how that change in fuel model would affect expected fire behavior.

The initial burning and repeated burning of the proposed fuel breaks would directly affect fuel loading and in turn the predicted fire behavior within the 1289 acres of the proposed action. Changes in surface potential flame lengths, rates of spread, and fire intensity. (Rothermel 1972) help illustrate the differences in predicted fire behavior from the pretreatment conditions to the proposed action. These changes can be illustrated by using site specific variables such as fuel moistures, wind speed, and slope that are entered into fire behavior modeling tools. The fire behavior modeling tool used for these calculations was BehavePlus 6. Further details can be found in Appendix B.

Along with accurate environmental inputs, the final input that is needed to calculate fire behavior is the applicable fuel model. The primary set of fuel models used today are the 40 standardized fuel models based on fire behavior and effects modeling. This set is more refined that the original 13 and a more site-specific fuel model can be selected enabling more accurate outputs. The most important part in selecting a fuel model for fire behavior calculations is selecting a fuel model that is the primary carrier of fire spread (Scott and Burgan 2005, Andrews et al. 2003). Three fuel models were selected to represent the pretreatment conditions currently found, or expected to be found within the proposed fuel breaks since some fuel breaks or portions of fuel breaks were burned due to multiple wildfires within the project area during 2023. These fuel models are: GR2, Low Load, Dry Climate Grass, and GR4, Moderate Load, Dry Climate Grass, for much of the project area, and GS2, Moderate Load, Dry Climate Grass-Shrub for areas where sage brush is found like Badger Canyon and parts of the McNary area. Two fuel models were selected that represent the results of the proposed actions in Alternatives 2 and 3. These fuel models are: GR1, Short, Sparse Dry Climate Grass, and GS1, Low Load, Dry Climate Grass-Shrub. A third fuel model is applicable but would provide no fire behavior; NB9, bare ground. This would be representative of a fuel break that was recently burned with areas that have little to no fuel available to contribute to fire spread. Table 13 in appendix B provides the fuel loading, t/ac, and a brief description of each fuel model. The description is a generalization of a representative fuel model. An area of dense grasses or continuous cheatgrass may only be 12 inches tall, but the fine fuel loading may accumulate to the 2.15 t/ac of a GR4 fuel model.

When comparing the modeling outputs between the pretreatment conditions and the expected conditions under the proposed actions, it can be seen these treatments would greatly reduce flame lengths and rates of spread within the project area and increase the effectiveness and safety of firefighters that are working to suppress fires. Figures 1 and 2 compare rates of spread between the pretreatment conditions and the proposed actions. Figures 3 and 4 compare flame lengths. By reducing the fuel loading and fuel height with these actions, flame lengths can be reduced from between 7-21 feet to less than two, and rates of spread would be reduced from between 88-479 to 6-12 chains per hour. For reference, a chain is 66 feet in length and there are 80 chains in a mile.

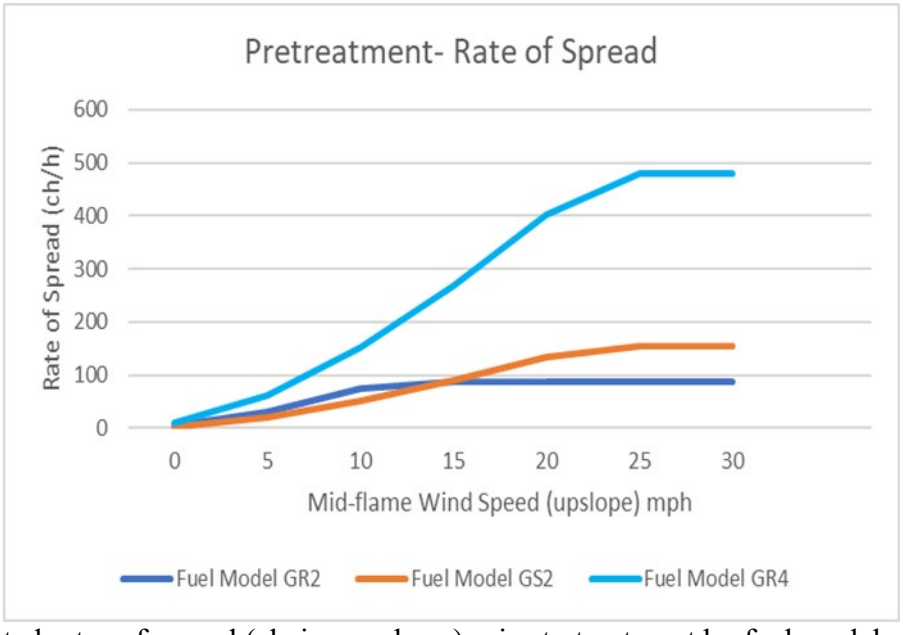

Figure 1. Predicted rates of spread (chains per hour) prior to treatment by fuel model at mid-flame wind speeds (miles per hour) 0-30 mph, in 5 mph intervals for GR 2, GR 4, and GS 2.

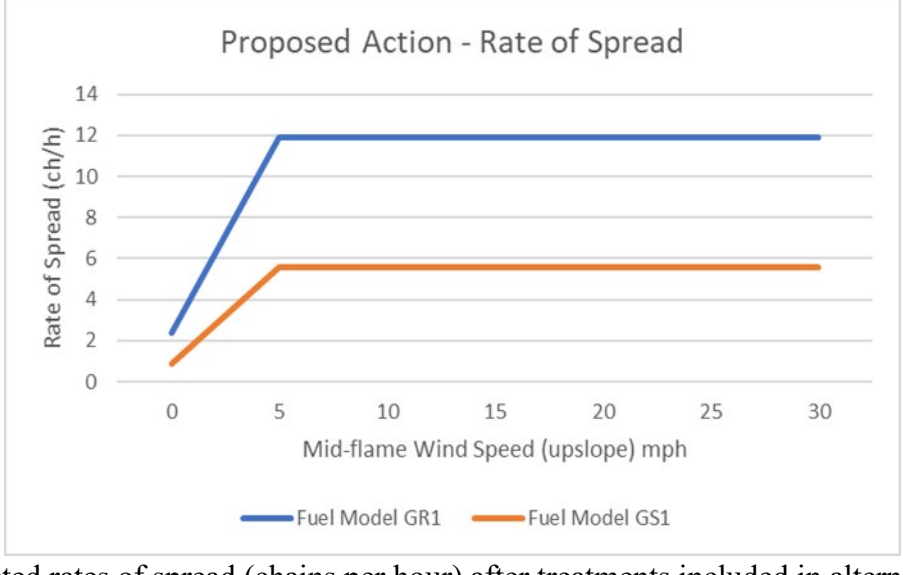

Figure 2. Predicted rates of spread (chains per hour) after treatments included in alternative 2 by fuel model at mid-flame wind speeds (miles per hour) 0-30 mph, in 5 mph intervals for GR1 and GS 1.

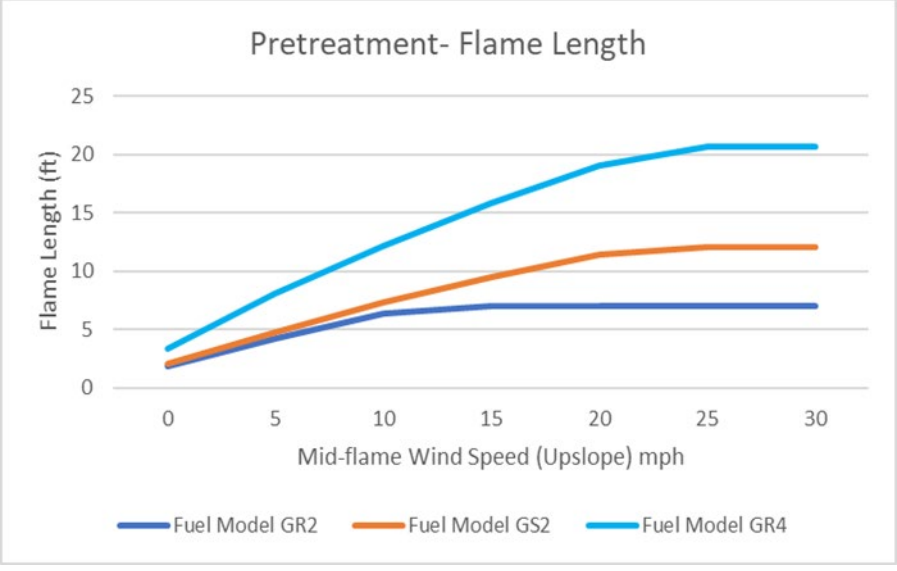

Figure 3. Predicted flame lengths (feet) prior to treatment by fuel model at mid-flame wind speeds (miles per hour) 0-30 mph, in 5 mph intervals for GR 2, GR 4, and GS 2.

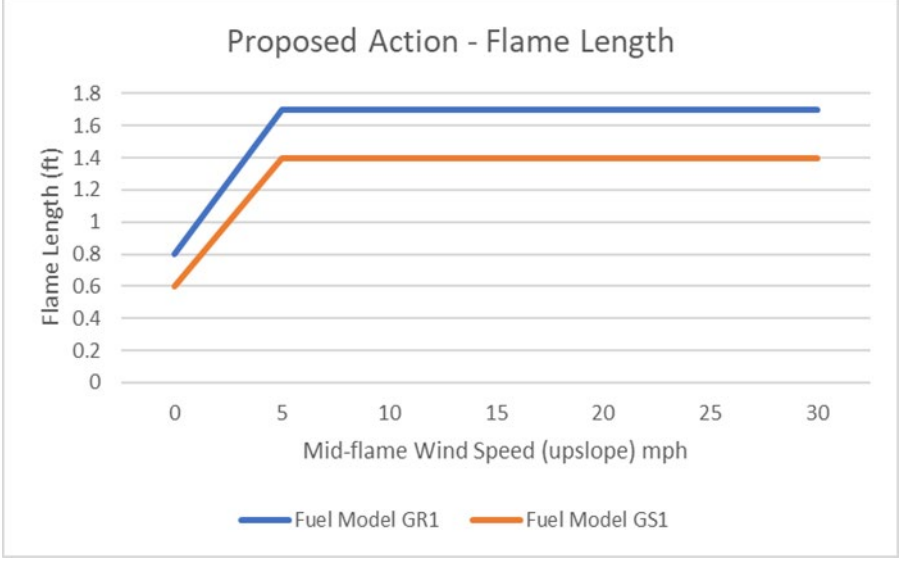

Figure 4. Predicted flame lengths (feet) after treatments included in alternative 2 by fuel model at mid-flame wind speeds (miles per hour) 0-30 mph, in 5 mph intervals for GR1 and GS 1.

According to wind readings from the two selected RAWS stations, Umatilla and Juniper Dunes, the average wind speed in the project area is 5-8 mph with average maximums between 15-24 mph in the summer months of 2023 (June-September). With these averages and the current fuel conditions within the project area, the expected flame lengths would quickly increase above both the established direct attack thresholds for both personnel (< 4 ft) and equipment (4-8 ft). Under the proposed action, the expected flame lengths, under the same fuel moisture conditions, would be less than two feet, see Figure 5.

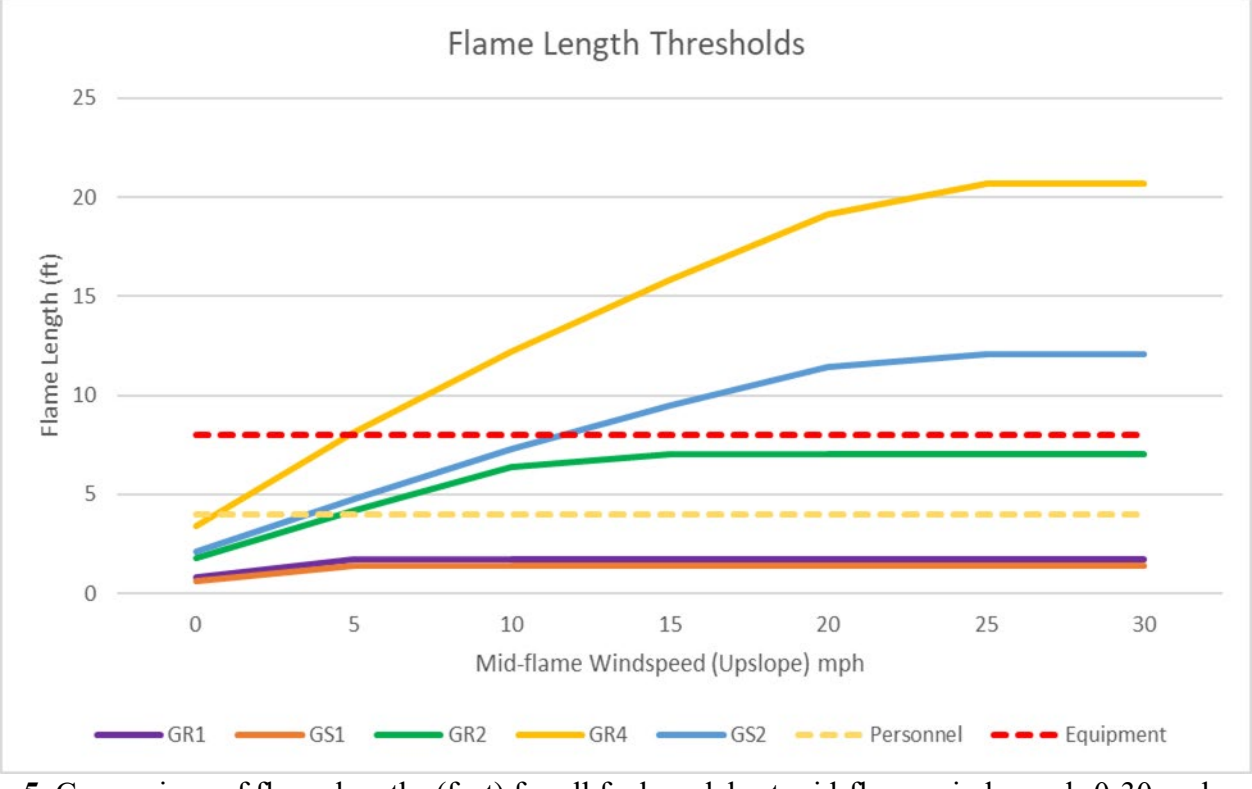

Figure 5. Comparison of flame lengths (feet) for all fuel models at mid-flame wind speeds 0-30 mph and how they correlate to the 4-foot flame length threshold for personnel capabilities and the 8-foot flame length threshold for equipment capabilities described in Appendix B.

The proposed herbicide treatments, both pre and post emergent, aid in the reduction of fuel loading and fire behavior. These treatments are targeted at mainly at cheatgrass and knapweed but would have some effect on all non-native or invasive species found withing the 1289 acre proposed project area. See Section 3.3 analysis for more detail. Cheatgrass, along with other non-native or invasive species, can greatly increase fuel loadings and expected fire behavior. Cheatgrass is a winter annual, growing rapidly during late winter and early spring and dying in early summer when most other plants are still green. Dead cheatgrass provides a continuous bed of highly flammable fuel that can readily carry a fast-moving fire. When the native flora is poorly adapted to a more frequent fire regime, the cheatgrass is able to gain a competitive advantage, resulting in a grass/fire cycle (Erickson and White 2007). This is mainly due to their growth characteristics compared to native species. This would depend on the species, but may include growth height, plant continuity, or volatile compounds found within the plant. These growth characteristics can contribute to greater fuel loading, higher rates of spread, and taller flame lengths compared to native plants.

As inferred by their name, bunch grasses naturally grow in bunches or clumps where there is a natural interspace (1-3 feet) between individual plants. What has been observed within the project area, primarily in the Badger fuel break because it is currently unburned, is that the interspace between the native bunch grasses has been filled in with cheatgrass. With these interspaces filled in, the tons per acre greatly increases compared to if the cheatgrass were absent or present at a lower percentage. Burning alone will reduce the surface cheatgrass. However, the soil would still potentially have cheatgrass seed in the seed bank, or the surface fire may not

consume all the above ground seed within the litter layer. Prescribed fire alone may increase cheatgrass and other invasives because they either germinate earlier or more rapidly and out compete native species for sunlight, water, or nutrients (Erickson and White 2007). However, in order for the pre-emergent herbicide treatments to be the most effective, there must be bare ground present to allow for the chemical to contact the soil and absorb. If surface vegetation is present, it would intercept the application of herbicide. By first burning the fuel break this creates bare ground and increases the effectiveness of the herbicide treatment. In order for either prescribed fire or pre-emergent herbicide to be most effective, they should be used in concert with each other. Post-emergent herbicides would work in the same manner to eliminate or suppress non-native species and open the interspace between native plants and create a less continuous fuel bed, reduce fuel height, or eliminate volatile plants depending on the target species. However, there is not the requirement for bare ground for these applications since they are designed to be effective when the plant is sprouting/developing.

The native seeding treatments proposed for this project would help to combat invasive species and replace areas within the proposed fuel breaks that are dominated by cheatgrass and noxious weeds such as knapweed with native species. This action would not only increase soil stability and expand the presence of native species but would also have benefits to reducing fuel loading and fire behavior. Following any disturbance there is potential for an increase in weeds or invasive plant species to outcompete the native species. This can be due to the disturbance providing canopy openings, reducing the cover of competing vegetation, or by creating favorable soil conditions such as newly exposed soil and increased nutrient availability (Erickson and White 2007). However, due to these same conditions, following disturbance can also be an opportune time to reseed with species that would not only combat invasives and weedy species, but that are tailored to the site conditions and are more likely to establish. It is imperative to reseed areas that are dominated by non-native species because without the reseeding, these undesirable species would either reestablish or possibly expand their footprint on the landscape only perpetuating current concerns. Also, if these undesirable plant species are eliminated by other proposed treatments, areas of bare ground would increase the potential for erosion. When selecting the proposed seed mix, the interdisciplinary team selected all site-specific native species to not only match the two major soil types found in the project area, but to combat the invasive species. The greatest concern to fuel loading and fire behavior in the sense of vegetation is the presence of cheatgrass. Sandberg bluegrass (*Poa secunda)* was specifically selected to naturally compete with cheatgrass. Sandberg bluegrass naturally grows in the interspace between larger bunch grass species where cheatgrass can commonly be found. Similarly, to cheatgrass, Sandberg blue grass is early to germinate compared to other native species found in the project area. Conversely, Sandberg blue grass usually occur small tufts with shorter and less dense growth compared to cheatgrass (Monsen et all 2004). These growth similarities make it a good competitor to cheat grass and more favorable to the desired fuel loading and fire behavior characteristics. Coupled with prescribed fire and herbicide treatments, the native seeding treatments would add both ecological benefits and help to achieve the desired fuel loading and fire behavior over time. The overall effectiveness of this treatment would depend on the ability of the seeding to germinate and establish.

Adaptive management allows land managers to review treatment effectiveness and environmental conditions and fine tune the proposed treatments. Monitoring would be used to determine what seasonality, timing, and modifications to the treatments that achieve the highest effectiveness for each treatment. These fine tunings could be on an individual fuel break level or across the entire project area. These adjustments allow land managers to achieve the desired future conditions of project, and ideally extend the timeframe between needed treatments to maintain the effectiveness of each fuel break.

The proposed hazardous fuel reduction activities directly affect less than 10% of the total adjacent BLM-administered lands. However, by implementing these proposed actions and adaptive management strategies, fires would be kept smaller and have lesser impacts to the environment and local communities. With fires being kept to a smaller size this would lessen the impacts to vegetation, soils, and air quality. These reduced impacts would then benefit the wildlife and other users of the area, as stated in applicable analysis below. There would be less continual resource damage from suppression activities and visual dozer lines on the landscape.

Furthermore, reducing fuel hazards in the analysis area, would decrease the likelihood of impacts to values at risk in the Wildland-Urban Interface, promote public safety and infrastructure protection that lessens impacts to the communities of Benton County, as well as improve fire suppression opportunities and firefighter safety. Over time, these activities would allow for the BLM and local stakeholders to implement restoration projects to recover habitat that has been lost in previous wildfires.

The BLM would also be able to better manage public lands for multiple uses including but not limited to, recreation, grazing, and traditional gathering opportunities. The current land uses on all associated BLM managed lands would continue in their current state until any applicable expiration dates (i.e. grazing permits, SRPs, Right-of-Ways) or the development of a new district RMP. These include fire suppression activities, grazing allotments, noxious weed treatments, wildlife habitat management, and general recreational uses, including historic gathering practices. There are some reasonably foreseeable actions associated with the project area. There are two special recreation permits (SRPs) under multi-year authorizations within the project area: 1) the Badger Mountain Challenge ultra-foot race, held the third weekend in March annually, and 2) the Quad Killer Vertical Kilometer Race, also a foot race, held the first two full weeks of October annually. Due to project design features and established timelines, there would be no implementation occurring during these events. However, depending on the exact timing of any project implementation these events may have to operate adjacent to the McBee, Benton Exit, or Yakitat fuel breaks. There is a full application submitted for grazing in the Horse Heaven Hills area, and an active custodial grazing authorization in the McNary area. While these proposed actions may temporarily impact the availability for grazing in the short term, if the proposed fuel breaks are effective in stopping the progression of a wildfire, allotted areas, or portions of areas for grazing would remain unburnt and thus be protected from fires likely to remove the forage needed for grazing. There was a new electrical transmission line constructed in early 2024 adjacent to the current line running north-south in the McNary West Fuel break. This may require additional infrastructure protection around the base of the poles at the time of prescribed fire operations. The area in which aerial herbicide can be applied would also be reduced after the installation of the new transmission line. Outside of BLM managed lands, it is likely that current land uses would continue for the foreseeable future, until the land is possibly developed over time. Current land uses include dry-land crop production, fruit orchards, cattle grazing and production, irrigation control, and undeveloped land holdings.

Within the project area, it is anticipated that using prescribed fire, herbicides, and seeding would increase soil stability, reduce fuel loading, and create a less continuous fuel bed when compared to the no action alternative. As a result, wildfires would spread more slowly, and their flame height would be reduced. With fires being kept to a smaller size, there would be fewer impacts to vegetation, soils, and air quality. Additionally, the likelihood of impacts to values at risk in the Wildland-Urban Interface would decrease, public safety and infrastructure protection would increase, and fire suppression opportunities and firefighter safety would improve. Surveying and monitoring would allow land managers to review treatment effectiveness and environmental conditions and manipulate or fine tune the proposed treatments.

Alternative 2 Targeted Grazing

The affected environmental for this alternative would be within the same footprint as the proposed action alternative, but the implementation of targeted grazing would only occur on BLM administered lands. This would encompass 824 acres of the 1,155 acres of BLM administered land included in the proposed action alternative. The objective of this alternative would be the same as the proposed action alternative with all the same implementation actions, but the addition of targeted grazing would be another mechanism to obtain that objective. Targeted grazing can be utilized in two different ways to obtain desired future conditions of the project. Targeted grazing can be utilized similarly to prescribed fire to reduce fuel loading and canopy cover to reduce fire behavior by the livestock biotically “mowing” vegetation within the fuel breaks. By having another mechanism to reduce fuel loadings, this would possibly allow for a longer return interval for the need of prescribed fire. Prescribed fire would still be needed to reduce litter, areas of uneaten vegetation. Due to the variable topography of the proposed fuel breaks, not all of the 1,155 acres of BLM administered land would be

able to be grazed, see Table 4 for targeted grazing feasibility. It is expected that livestock would prefer topography that has slopes under 30%. In these areas, prescribed fire could be used in concert with the targeted grazing mechanism, and in turn reduce the prescribed fire area in the proposed treatment areas.

With proper timing, targeted grazing could be utilized to reduce cheat grass and other invasives. If livestock are grazing in the late fall and winter months when the cheat grass is either germinating or starting to actively grow, the livestock could act as a biotic control and consume the cheat grass before it can produce seed and reproduce (Launchbaugh, et al., 2008; Schmelzer, et al 2014). This would also allow for a method of cheat grass reduction to occur in the possible ¼ mile buffer of residences where aerial herbicide cannot be used without permission. Along with these added opportunities to reach desired conditions of the project, by adding targeted grazing to the proposed action, it also widens the window for implementation timeframes. Livestock could be utilized during periods when environmental conditions are not favorable to the implementation of prescribed fire. If weather readings are outside of acceptable conditions stated in the prescribed fire burn plan, livestock could still be able to be utilized given there are no other site-specific concerns. Given establish project timelines, this would likely be during the colder, wetter months of the winter season when it may be either too cold or too wet to implement prescribed fire operations to meet objectives. Similarly, targeted grazing could be utilized if the timing of precipitation limits the application of herbicide treatments. Targeted grazing may not have the same effectiveness compared to herbicides, but it would be better than not being able to apply any invasive controls. By adding in the mechanism of targeted grazing to the proposed action, it provides another tool to implement project controls, as well as expands the timeframes for implementation due to environmental conditions.

The cumulative effects of this alternative would be very similar to the proposed action alternative. These actions would keep fires smaller and keep the public and firefighters safer with fewer impacts to property and infrastructure. This alternative would also reduce negative impacts to the areas outside of the proposed fuel breaks. With the addition of this treatment mechanism the overall effectiveness of the proposed treatments would increase. Having another option to maintain these treatment areas would provide greater opportunities to land managers to maintain the desired conditions within the project area to reduce fuel loading and fire behavior. The reasonably foreseeable actions are also the same. All livestock and temporary infrastructure would need to be removed to not impede participants of the two competitions, Quad Killer and the Badger Mountain Challenge. Targeted grazing, along with prescribed fire, would both temporarily reduce the amount of available vegetation for general grazing in fuel breaks that overlap grazing allotments.

3.2. Issue 2 - How would the proposed herbicide treatments affect public safety (i.e., traditional use plants and the recreating public)?

Affected Environment

Recreating Public: The casual use recreating public routinely travel the natural landscape both on roads and trails as well as cross-country (non-motorized, mostly hiking). Subsequently, any areas receiving herbicide treatments potentially could be traversed by the recreating public, whether on foot, bicycle, or OHV (on existing motorized routes). Recreational use via the Horse Heaven Hills area's two current multi-year special recreation permits, is limited for both permits to hiking/running on specified trail segments. That use occurs within short-term specified dates updated annually in a similar dates range. Subsequently, that herbicide use is managed to avoid hazard to those recreational visitors. As reflected in the Spokane NIMP ES, Appendices B and C, human use of areas treated by herbicides should be avoided for the timeframe as prescribed depending on the recommended interval of non-use following application of any particular herbicide.

For contracted weed spraying at Horse Heaven Hills, prior to treatment, the contractor posts on the McBee Trailhead information kiosk a "notice of herbicide application" that includes the date sprayed and the chemical used. A recommended non-use interval timeframe is not included on the notice. Neither herbicide treatments nor subsequent posting of "notice of herbicide application" has occurred at the McNary land units.

Traditional Use Plants: Indigenous peoples have used and managed lands within the project area, now administered by the BLM Spokane District, for thousands of years, as evidenced by oral traditions, archaeological data, and ethnohistorical accounts (Haug 2004, Hunn 1990, Hunn et al. 2015, Lally 2011, Ray 1936, Relander 1956). Today, tribal communities maintain attachment to their ancestral homelands located within the project area. To some, this manifests in exercising their tribal treaty rights in the form of hunting, fishing, and plant gathering activities. Numerous tribal communities, however, share a general concern that culturally significant resources and landscapes within the project area be responsibly managed, maintained, and preserved for present and future generations. Three federally recognized tribes consider lands within the project area key to their cultural identities and histories: the Confederated Tribes and Bands of the Yakama Nation, the Confederated Tribes of the Umatilla Indian Reservation, and the Confederated Tribes of Warm Springs.

While many of today's tribal communities no longer rely heavily on the collection and processing of wild plants for their daily sustenance, most consider the responsible stewardship of these resources to be of great importance for the preservation of their cultural heritage. Tribes in the project area may be reluctant to provide exact information regarding the use, type, and location of plants currently gathered for traditional purposes. In most scenarios, the BLM Spokane District does not know how often or precisely where plants are collected, but it is known that traditionally significant plants are gathered on a regular basis by tribal members throughout the project area. In addition, plant gathering areas typically occur within culturally significant landscapes that can often (but not always) contain various types of cultural resource sites (see Issue 8, below).

Environmental Effects

No Action Alternative:

Under the No Action Alternative, the BLM would continue its program to control invasive plants and noxious weeds across the entirety of the Spokane District at current levels (BLM 2018). The rotation of weed treatments on BLM lands, however, has not been sufficient to address the rapid spread and establishment of invasive species within the project area. The uncontrolled establishment of noxious weeds increases the risk of wildfire severity within and around the Horse Heaven Hills and McNary parcels. Wildfires directly risk the health and safety of the recreating public and the well-being of indigenous communities via smoke inhalation and potential entrapment during a wildfire. Indirectly, large infestations of invasive weeds can "choke out" native plant communities and decrease the availability of these resources for traditional use practitioners.

Herbicides have the potential to harm traditional use plants and the health of people gathering, handling, or consuming exposed plants, fish, and/or wildlife. The risk for human exposure to herbicides currently used in the control of noxious weeds in the project area were analyzed under the Spokane NIMP EA. Conducting consultation with tribal communities to identify plant gathering areas prior to herbicide treatments, minimizing applications during peak gathering seasons, buffering herbicide treatments in known traditional use areas, and minimizing exposure of fish and edible plants to 2,4-D was found to reduce the potential for adverse human health effects to negligible levels. Standard Operating Procedures (SOPs) designed to further reduce risks for exposure and accidental ingestion and adherence to project design features (signing treatment areas and applying water-soluble dyes to sprays) would minimize the potential for adverse human health effects under such scenarios (BLM 2018).

Cumulative effects from this alternative would include effects associated with reactionary fire suppression tactics as well as a reduction in the effectiveness of noxious weed and invasive plant control programs within and around the project area. The incidence of severe wildfires is expected to increase under the No Action Alternative, which in turn, would contribute to the continual spread of invasive plants and noxious weeds. In such a scenario, native plant species would continue to be displaced and wildland fire regimes would likely intensify. This would result in more emergency-based rehabilitation and stabilization efforts and inhibit proactive management aimed at controlling or eliminating fuel loads and fire intensity. A decrease in native

vegetation overall is expected to result in less desirable landscapes for indigenous communities in both the short (< 3 years) and long term (> 3 years).

Alternative 2 - Proposed Action

Site-specific herbicide treatments would increase beyond established levels in the project area under the proposed action (BLM 2018). This could increase the likelihood of accidental ingestion and/or exposure to herbicides to tribal communities utilizing these landscapes for traditional use activities, and directly decrease the abundance of some targeted species within the treatment area in the short term (< 3 years) (BLM 2018). Herbicide treatments under this Alternative, however, shall adhere to the SOPs and Design Features established within the Spokane NIMP EA (Appendix A) which would reduce these potentials to minimal levels, similar in scope to those of the No Action Alternative.

Loss of some traditional use plants may occur through aerial or ground-based herbicide applications and the construction of fuel breaks, but the removal and control of dense populations of noxious weeds and invasive plants is expected to increase the overall health of traditional use plant populations in the long term (3+ years) on a landscape level (BLM 2018). Negative impacts could potentially arise in the short and long term if there are repeated herbicide treatments in areas where tribal members gather plants, or if access-restrictive treatments occur during peak collection periods, because such actions would generally discourage the continued utilization of these areas by tribal communities. The implementation of additional herbicide treatments beyond levels established within the Spokane NIMP EA in combination with prescribed fire is expected to further decrease the range and density of invasive plant species within the project area (BLM 2018). Cumulatively, the reduction of these fuels is expected to increase overall landscape health and allow for further propagation of native species of traditional importance to tribal communities.

Alternative 2 with Targeted Grazing

The addition of targeted grazing on BLM lands within the project area is expected to reduce the overall need for herbicides to control the range and density of invasive plant communities. This will, in turn, reduce the likelihood of accidental ingestion and/or exposure to these chemicals by applicators, recreationists, and tribal members engaged in plant gathering activities.

3.3. Issue 3 – How would the proposed treatments affect native plant communities, noxious and invasive weeds, biotic soil crust, and rare plants in the project area?

Affected Environment

Horse Heaven Hills

Vegetation in the Horse Heaven Hills is characterized by Inter-Mountain Basins Big Sagebrush Steppe and Columbia Plateau Steppe and Grassland ecological systems. The sagebrush steppe system is normally found on the lower slopes and flats of the Horse Heaven Hills, but currently frequent fire has left few shrubs here. The grassland system is defined as less than 5% shrub cover and occurs on the upper slopes and ridgetop of the Horse Heaven Hills. Both systems are classified as steppe vegetation because of the greater than 25 percent cover of perennial forbs and bunchgrasses (Rocchio and Crawford 2015). The Horse Heaven Hills has not been grazed by livestock since 1987.

The Washington Natural Heritage Program (WNHP) identifies rare and high-quality ecosystems based on their ecological significance, rarity, and ability to support biodiversity. These ecosystems are often characterized by unique flora and fauna, specific habitat requirements, and can often be under threat from development, invasive species, or climate change. Most of the north-facing slope of the Horse Heaven Hills is mapped as a Washington Natural Heritage Program (WNHP) rare and high-quality ecosystem representing the Wyoming big sagebrush/bluebunch wheatgrass with Cusick's bluegrass (*Poa cusickii*) plant association in good to excellent condition (WNHP 2022). The Gibbon, Yakitat, Benton Exit, and McBee proposed fuel breaks occur in this

polygon. The WNHP polygon is 5185 acres and is the second largest mapped occurrence of this plant association type after the Hanford Reach National Monument. Cusick's bluegrass is uncommon in the Columbia Basin being restricted to the more mesic north-facing slopes where Idaho fescue (*Festuca idahoensis*) usually grows. However, in the Horse Heaven Hills, Idaho fescue is absent from these microsites and replaced by Cusick's bluegrass. Cusick's bluegrass decreases with heavy grazing (USDA 1997), and the Horse Heaven Hills is currently ungrazed, so conditions here favor this uncommon plant association.

The exact condition, and therefore health and resilience, of the vegetation varies in the Horse Heaven Hills based on topography, aspect, and amount of perennial grass cover. Overall, perennial grass cover is good in the Horse Heaven Hills (except for the Badger Canyon and Yakitat fuel breaks). Perennial grass cover in 2023 averaged about 22-42% cover, but invasive annual grass cover, primarily cheatgrass (*Bromus tectorum*), is also very high, averaging 24% cover (Table 7). The Badger Canyon fuel break is in a more degraded condition than the others having only 22% perennial grass cover and 54% annual grass (Table 7).

Because this area has more cheatgrass than perennial grass it may have reached a threshold and is in the process of transitioning to a non-native annual system. A common threshold used to describe shrub-steppe systems that are resistant to transition to non-native annual dominance is less than 10-15% cheatgrass cover (Pastick et al. 2021), and by this measure only the Yakitat and Benton Exit fuel breaks are considered resistant.

Table 7. Existing amounts of shrub cover, perennial grass cover, annual grass cover, and total herbaceous biomass in the proposed fuel breaks.

Fuel Break	**Acres**	**Shrub (%)**	**Perennial Grass/ Forb (%)**	**Annual Grass/ Forb (%)**	**Total Herbaceous Biomass (lbs/ac)**	**Mean Fire Return Interval (yrs)**
Gibbon	115	4	37	38	1190	30.5
Yakitat	162	4	37	12	916	35.5
Benton Exit	68	6	42	23	1191	10.5
McBee	170	2	28	39	1158	10.8
Webber	141	3	35	32	1142	4.7
Badger	69	2	20	56	1256	40+

Data is taken from the Rangeland Assessment Platform tool (RAP 2023) and is an average for the years 2021-2023. Mean fire return interval is calculated as the average time between fires from 1981-2023 as reported in the National Interagency Fire Center fire history data layer.

Fire was a part of historical shrub-steppe dynamics, but the interval is debated. Miller and Edelmen (2001) estimated 12-15 years (for productive sites) to 50-100 years (less productive sites) intervals, while other studies have suggested longer historic fire free intervals. The historic fire return interval for vegetation in the Horse Heaven Hills is described by the LandFire vegetation data layer as 36-50 years. Fire return intervals in more recent times, from 1981 to 2023, vary by fuel break area with the Webber fuel break currently experiencing the most frequent fire with fire reoccurring on average every 4.7 years. Other fuel breaks, including all of those within the WNHP rare and high-quality ecosystem (Gibbon, Yakitat, Benton Exit, and McBee areas, see Table 7), have experienced longer mean fire returns of 10-35 years since 1981. These fuel breaks are currently closer to their historic fire regime then the Webber fuel break. Shrub-steppe communities that are in balance with their natural fire regimes support higher plant diversity and increased resistance to exotic annual grass invasion and have increased value.

Due to lack of recent fire Badger Canyon has the largest sagebrush plants, with some up to 5-6 feet tall, which combined with the abundant cheatgrass, present a risk of more intense fire severity that could damage the remnant native plant communities. The Benton Exit fuel break also has a developed but sparse (6%) shrub component.

Biocrust communities (fungi, cyanobacteria, bryophytes, and algae) occupy the soil surface in many of the interspaces between vascular plants in the Horse Heaven Hills and are known to contribute to the health and resilience of plant communities through their ability to cycle nutrients, reduce erosion, and compete with invasive annual grasses such as cheatgrass. In 1999, Horse Heaven Hills was known to have abundant biocrusts (Ponzetti et al., 2007) including a species of concern, see *Texosporium* section below. Since that time 11 wildfires have burned the study area with some areas remaining unburned, and biocrust abundance and species richness has declined overall between 1999 and 2020 but has remained constant in plots without wildfires (Root et al., 2023). Declines in biocrust abundance in the Horse Heaven Hills were related to wildfires through the expansion of exotic annual grasses (Root et al., 2023).

There are 24 gullies that incise the north slope of Horse Heaven Hills, and each proposed fuel break is situated to span 1-2 of these. The gullies act as traps and collection zones for various species of invasive weeds (Schuller 2009). The most prominent weeds in these areas are non-native Jim Hill mustard (*Sisymbrium altissimum*) and Russian thistle (*Salsola iberica*). Both plants form tumbleweeds that collect in topographic depressions such as gullies where they have changed the natural vegetation from open, gravelly/rock slopes into dense concentrations of tumbleweeds overlying the natural vegetation. About 50 percent of the gullies in the Horse Heaven Hills exhibit this pattern (Schuller 2009). The proposed fuel breaks have not been surveyed for weeds, but based on past reports some are likely have dense accumulations of tumbleweeds in the gullies. In the Horse Heaven Hills, "List B" noxious weeds are few and limited to disturbed areas, roadsides and gravel pits. For example, small (<1 ac) infestations of Dalmatian toadflax (*Linaria dalmatica*), diffuse knapweed (*Centaurea diffusa*), spotted knapweed (*Centaurea stoebe*), and rush skeletonweed (*Chondrilla juncea*) are present at some sites, but do not occur as large infestations.

Rare Plants

Texosporium sancti-jacobi (woven-spore lichen, BLM Sensitive) – Woven-spore lichen is a small (0.5 – 3 cm) crustose lichen known to occur in the Horse Heaven Hills and only one other site in Washington (WNHP 2021). In the project area, it occurs at ten sites on the north face of Horse Heaven Hills, with one site occurring in the proposed Benton Exit fuel break polygon. The species is most common on decomposing bunchgrass clumps that are impregnated with soil and elevated above the surrounding surface. It is also found on old, decaying mammal scat. Fire generally eliminates the species (WNHP 2021). Threats to *Texosporium sancti-jacobi* is loss of habitat by extensive destruction to the soil crust by overgrazing, invasion of weedy annual grasses and the resulting increases in fire frequency (McCune 1992). Observations suggest Texosporium populations can recolonize areas following severe disturbance, but over a long period of time (McCune 1992).

McNary Parcels

Vegetation at the West McNary proposed fuel break is classified as Inter-Mountain Basins Big Sagebrush Shrubland and Columbia Plateau Steppe and Grassland ecological systems, but on more sandy soils than typical shrub-steppe. Shrubs on this parcel recently burned in a 2023 wildfire. There are remnants of dead big sagebrush (*Artemisia tridentata*) "skeletons" on the lower slopes, but yellow rabbitbrush (*Chrysothamnus viscidiflorus*) is fairly ubiquitous and is resprouting across the parcel, and snow buckwheat (*Eriogonum niveum*) and goldenaster (*Heterotheca*) are sub-shrubs that also appear to be fairly common on the parcel.

Sandy soils and a generally south facing aspect make these sites prone to weed invasion. Sillusi Butte, a 500 ft tall outcrop with 30-60% slopes, occurs in the center of the proposed McNary West fuel break. Soils on the south face and lower slopes down to McNary Road are generally shallower and support less vegetation than soils on the backside (north) of the butte, which are a deeper sandy loam on rolling flats. Both areas are heavily invaded by cheatgrass and diffuse knapweed, but the rolling flats on the backside are nearly completely

converted to an exotic annual dominated state. The BLM lands are grazed by livestock. Perennial grass cover is low at the McNary West fuel break, averaging about 18% cover, and invasive annual grass cover primarily cheatgrass (*Bromus tectorum*), is very high, averaging 41% cover (Table 8) indicating low resistance to further weed invasion and low resilience to future disturbance at this site. There is remnant native vegetation in patches in the McNary West fuel break, primarily Sandberg bluegrass (*Poa secunda*) and sand dropseed (*Sporobolus cryptandrus*), and needle-and-thread (*Hesperostipa comata*).

The slopes of Sillusi Butte are the only locations in the McNary West fuel break that have intact biotic soil crusts, and these occur on rock outcrops associated with Sillusi Butte. Two species of rare mosses are known to be present. *Bryoerythrophyllum columbianum*, (ranked Imperiled (S2) in Washington) is known to 22 sites on Sillusi Butte, and *Aloina bifrons* (ranked Critically Imperiled (S1) in Oregon and unranked in Washington) is known to 4 sites on Sillusi Butte.

Table 8. Existing amounts of shrub cover, perennial grass cover, annual grass cover, and total herbaceous biomass in the proposed fuel breaks.

Fuel Break	Acres	Shrub (%)	Perennial Grass/Forb (%)	Annual Grass/Forb (%)	Total Herbaceous Biomass (lbs/ac)
McNary West	353	6	19	38	1234
McNary East	211	4	23	39	1259

Data is taken from the Rangeland Assessment Platform tool (RAP 2023) and is an average for the years 2021-2023.

Vegetation at the McNary East fuel break is composed of sands and big sagebrush-steppe on the upper slope of BLM lands. The shrub component on U.S. Army Corp of Engineers (USACE) land is high and composed of large stature big sagebrush with dense patches of antelope bitterbrush (*Purshia tridentata*) indicating a lack of recent fire. Perennial grass cover averages about 19% cover, and invasive annual grass cover primarily cheatgrass (*Bromus tectorum*), is very high, averaging 38% cover (Table 8). The sides of the lower access road (USACE lands) are heavily infested with noxious weeds including kochia (*Kochia scoparia*), knapweeds, Russian thistle (*Salsola*), Russian olive (*Elaeagnus angustifolia*), and common reed (*Phragmites*). The BLM lands on the upper slope, however, exhibit more native diversity with open, discontinuous canopy of big sagebrush and bitterbrush with a well-developed herbaceous layer. There are two species of rare moss documented to the East McNary parcel which are located on rock outcrops and form part of the biotic soil crust (*Tortula protobryoides*, 1 site, and *Didymodon eckeliae*, 1 site).

Environmental Effects

No Action Alternative

With no action, current trends in native plant community dynamics would continue both within the fuel break polygons and in the surrounding areas. The Washington Natural Heritage Program (WNHP) rare and high-quality ecosystem would not be used as fuel breaks. Areas of high resilience and resistance such as the Yakitat and Benton Exit fuel breaks would only be disturbed by wildfire, which has so far maintained these as unique and high-quality shrub-steppe and grasslands. Biotic crust communities may continue to decline as indicated by Root et al. (2023) in areas of high annual invasive grasses such as the Gibbon and Badger Canyon fuel breaks but would remain stable in the other fuel breaks that have higher resilience and lower amount of invasive annual grass. The fuel break polygons would not be subject to frequent, low intensity prescribed fires as in the proposed action, so fine fuel loads would stay at current levels until a wildfire occurs. This would cause rapid

rates of spread for wildfires, but due to the low amounts of woody fuels, fire severity on native plant communities would continue to be light to moderate and maintain native plant communities in the areas of high resilience. The Badger and McNary East fuel breaks would retain their relatively higher shrub component until a wildfire occurs, which could cause moderate fire severity effects on vegetation that would increase the amount of annual grass in these areas post wildfire.

Noxious weeds would continue to be controlled under the Spokane NIMP EA, but large-scale aerial applications of imazapic, aminopyralid, and/or clopyralid would not be prioritized in the fuel breaks under this no action alternative. The lack of large scale weed treatments would allow annual grasses to compete with native perennial grasses unchecked but would also avoid any impacts to susceptible non-target plants such as perennial forbs and biotic crusts, including the BLM sensitive lichen *Texosporium sancti-jacobi* in the Benton Exit fuel break.

Past, present, and foreseeable future actions include current livestock grazing (McNary parcels only), wildfire suppression activities (dozer and disk line creation), post fire Emergency Stabilization and Rehabilitation (ESR) treatments such as seeding and herbicide applications, rights-of way ROW authorizations, and motorized and non-motorized recreation use. The effects of no action (allowing plant communities to respond to wildfire-driven return intervals) would be influenced by the suite of other disturbances described above including wildfire suppression activities (dozer and disk line construction). The amount of fire suppression damage that would occur with no action in not knowable but assumed to be higher than the proposed action due to the lack of any other option other than dozer and disk line creation for fighting fire.

Alternative 2 - Proposed Action

Direct and indirect effects to vegetation from this project include,

1. initial prescribed burning of shrub-steppe vegetation in fuel breaks between October 15 March 15 (1289 ac),
2. periodic burning of fuel breaks when conditions exceed fuel model GR-2 (with a minimum two-year rest),
3. construction of 3-foot-wide handlines (41,488 linear ft),
4. pre-emergent broadcast applications of imazapic for cheatgrass control,
5. post-emergent broadcast applications of clopyralid and/or aminopyralid for knapweed control.
6. seeding of native grasses and forbs fuel breaks,
7. the potential for change to a longer fire regime outside of fuel breaks.

Early spring or late summer/fall prescribed burns, such as in the proposed action, can be used to promote native perennial grasses (Brown et al. 2000). Most of the native perennial grasses on site are expected to survive the prescribed burns, and surviving grasses and accompanying forbs are expected to increase in biomass production (Brown et al. 2000). Natural recruitment of perennial grass seedlings is not expected for 3 to 5 years following a fire, but forbs such as common yarrow, lupines, larkspurs, and mustards are expected to increase for several years followed by opportunities for the establishment of perennial grass seedlings. Cheatgrass seed banks present in these communities may negatively influence reestablishment of native bunch grasses and shrubs (Brown et al. 2000) because fire releases a flush of available nitrogen that cheatgrass utilizes before perennial grasses have a chance to use it. Fire return intervals of 5.5 years can maintain cheatgrass dominance (Brown et al. 2000).

Following disturbance by fire in areas where cheatgrass is present, it reestablishes from abundant seed. Even when fire destroys 90 percent or more of its seed, it can reestablish and compete significantly with native perennials (Bradley 1986; Monsen 1992 in Brown et al. 2000). Over a period of years, cheatgrass gains dominance over perennials and increases the flammability of the site (Peters and Bunting 1994 in Brown et al.

2000). Repeated fire will diminish the perennial seed bank and allow cheatgrass to increase its dominance. However, areas with at least one bunchgrass per square meter may be more resilient (Ypsilantis 2003). Once cheatgrass becomes abundant enough to increase the likelihood of fire, repeated fires may occur frequently enough to eliminate shrubs such as sagebrush bitterbrush and native perennials. As wildfires become more common cheatgrass can essentially dominate a site (Monsen 1994 in Brown et al. 2000). This is more likely to occur in sites with low resistance such as south facing slopes and areas with already invaded by cheatgrass 10-15% cheatgrass or following droughts. The fuel breaks at the Horse Heaven Hills are on north facing slopes with high resistance to invasion, and pre-emergent imazapic treatments that are part of the proposed action will reduce the chances of cheatgrass increasing in the fuel breaks. However, imazapic is known to cause weed shifts to invasive annual forbs such as prickly lettus (*Lactuca serriola*) and Russian thistle (*Salsola tragus*), so although invasive annual grass may decrease, invasive annual forbs are expected to increase in the fuel breaks. Knapweed and cheatgrass at the lower resistance fuel breaks such as the Badger and McNary fuel breaks would be controlled with herbicides and seeded with native species to help resist the invasion of cheatgrass in these sites but may also experience weed shifts to invasive annual forbs.

In sagebrush ecosystems, prescribed burning will generally decrease cheatgrass cover only in the short term, so in areas where cheatgrass dominates the understory, fire may best be used as a seedbed preparation technique prior to seeding desirable species. Burning of mixed shrub- cheatgrass stands generates enough heat to kill most cheatgrass seeds and may offer a 1-season window for the establishment of perennial seedlings (Zouhar 2003). The period of reduction of cheatgrass density (1-2 years) is not usually long enough to allow for the establishment of perennial seedlings. Cheatgrass plants that do establish the first postfire year tend to produce so much seed per plant that total postfire cheatgrass seed production for a site may actually increase by a factor of 100 over preburn production. Unless desirable species establish and outcompete cheatgrass, density of cheatgrass plants may exceed preburn levels within 1 to 5 years (Zouhar 2003). If fire is used as a pretreatment to seeding in sagebrush communities depleted of perennial herbs, and levels of annual grasses are low at the time of the fire, perennial seedlings may establish before the annuals dominate the site if perennials are seeded the first year after fire (Zouhar 2003). Seeding burned areas immediately after fire will reduce the "influence" of cheatgrass but is not likely to exclude it.

Prescribed fires in the planned fuel breaks will cause a shift in the shrub species from big sagebrush (*Artemisia tridentata*) and antelope bitterbrush (*Purshia tridentata*) to yellow rabbitbrush (*Chrysothamnus viscidiflorus*) and spineless horsebrush (*Tetradymia canescens*). This effect would be particularly high in the East McNary fuel break where there is a diverse shrub community of fire sensitive antelope bitterbrush and big sagebrush. An overall reduction in shrub canopy cover in these areas is expected, but due to the cool conditions of the prescribed burning, some, as much as 50% possibly, of the existing shrub layer may survive. Rabbitbrush is especially common in these areas and is expected to increase in cover with burning.

Handlines for prescribed fire implementation would be three feet wide and hand dug or scraped to bare mineral soil with water bars. A total of 41,488 linear ft of new handline would remove approximately 2.9 acres of natural vegetation. The disturbance would be intermittent occurring each time the burn unit was used. Handlines would be at high risk of being used by the public as informal motorized and non-motorized routes especially in popular recreation areas such as the Horse Heaven Hills. These linear disturbances may serve as vectors for weed seed movement to other areas if carried by the recreating public. The seeding of handlines will occur but is expected to take 2-3 years to establish vegetation, so there is a risk that seeding these will not succeed due to disturbance by the public and reuse for the next prescribed fire. However, the placement of straw waddle would prevent erosion of any bare ground and may also deter motorized recreationists. The various fuel breaks would have varying levels of impacts from new handlines and their maintenance over time due to varying amounts of new construction (Appendix C). The highest level of handline impacts is with the Benton Exit fuel break (75% of the handlines being new construction), and the Gibbon fuel break with 67%

new construction. Notably, the Webber fuel break contains no new handline construction (0%) and instead uses existing features only; therefore, the impacts described above would not occur at the Webber fuel break.

The effects to vegetation from aerial herbicide treatments (broadcast applications of imazapic for cheatgrass and clopyralid and/or aminopyralid for knapweed control) have been analyzed in the existing Spokane NIMP EA. Broadcast application of these herbicides may incidentally reduce residual desirable plant species; however, the overall treatment effectiveness is enhanced by reducing the competition between native plants and noxious weeds (BLM 2018, p 86). Because aerial spraying is more prone to drift and cannot be done as precisely as a boom or a wand, it is at greater risk of having non-target plant impacts than ground methods (BLM 2018, p 93). However, project-specific design features (50-ft buffers) would be used to reduce risks associated with herbicide application to non-target vegetation including the BLM sensitive plant *Texosporium sancti-jacobi* (woven-spore lichen) at the Benton Exit fuel break and the two rare mosses at West McNary and East McNary (*Bryoerythrophyllum columbianum*, and *Aloina bifrons*). Treatment-related disturbance could also create conditions favorable for re-invasion by the same or other noxious weeds, although this is reduced with aerial application. Pre-project clearance surveys for *Texosporium* will inform the placement of required buffers in the Yakitat, Benton Exit, and McBee fuel breaks so that this BLM sensitive species is not impacted by herbicide applications. Several areas of the fuel breaks in the Horse Heaven Hills cannot be treated aerially due to standard operating procedures requiring the BLM to avoid residences during aerial applications by 1000 feet. These areas would not be treated with herbicides because they are generally too steep for ground vehicles. Therefore, approximately 42 acres (25%) of the McBee fuel break, 34 acres (24%) of the Webber fuel break, 15 acres (14%) of the Badger fuel break, and 16 acres (23%) of the Benton fuel break would not be treated aerially with herbicide. Cheatgrass may increase in these areas due to repeated fire disturbance, but since these areas are currently dominated by perennial grass, they would be resistant to major shifts toward invasive annual grasses.

Re-vegetation would be utilized to establish native vegetation in plant communities that are below healthy stocking rates of perennial grass. This will promote soil stability and reduce conditions conducive to noxious weed establishment and spread, however revegetation efforts on the steep slopes of Hose Heaven Hills fuel breaks are unlikely to succeed due to the inability to adequately achieve seed to soil contact, which is vital for germination and usually achieved with tractor-based harrows or rangeland drills that are impractical on steep slopes. The need for revegetation is greatest in the East and West McNary fuel breaks and portions of the Badger fuel break, so these areas would experience the largest improvement toward desired conditions due to favorable conditions for tractor-based seed incorporation. The fuel breaks in the Horse Heaven Hills are currently in good condition for perennial grasses so would likely not benefit from seeding, however seeding smaller disturbances within these could add to overall site integrity.

Fuel breaks in the eight locations proposed may reduce the size of fires and increase the fire return intervals on the landscape provided that the fuel breaks were recently burned and effective at stopping fire. The effects of longer fire return intervals and longer fire rotations would allow for perennial grass and biotic crust communities including *Texosporium* to exert a competitive advantage over cheatgrass, knapweed, and other invasive plants. This would increase the resistance and reliance to disturbance for the native plant communities. If landscape-wide fire return intervals can be maintained at greater than 12-15 years (Miller and Edelmen, 2001), or at least greater than 5.5 years (Brown et al. 2000) healthy native plant communities that are resilient to invasive annual grass invasion would dominate. However, within fuel breaks, fire return intervals will change from the current mostly 10-30 years for most fuel breaks to approximately every 3 years under the proposed action, which will degrade native plant communities where present and transition them to invasive annual grass

and invasive annual forb communities. The transition to invasive annuals would be most pronounced in the fuel breaks located in the WNHP rare and high-quality ecosystem (Gibbon, Yakitat, Benton Exit, and McBee fuel breaks) since these high-quality communities would be degraded. Although not in the WNHP polygon, the Webber fuel break supports the same high value north slope native plant community and would be similarly degraded. Effects at the West McNary fuel break are not expected to be as severe because current vegetation there is mainly invasive plants already, so project activities do have the potential to increase native bunchgrass communities though seeding here. Sagebrush and bitterbrush shrubs will be lost in the fuel breaks through frequent burning with the largest losses being at the East McNary and Badger Canyon fuel breaks.

Cumulative effects to native plant communities result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions. Other past, present, and reasonably foreseeable actions affecting vegetation in the project areas include current livestock grazing (McNary parcels only), wildfire suppression activities (dozer and disk line creation), post fire Emergency Stabilization and Rehabilitation (ESR) treatments such as seeding and herbicide applications, rights-of way ROW authorizations, and motorized and non-motorized recreation use. The Horse Heaven Hills parcels are not currently grazed by livestock, but it is reasonably foreseeable that they will be in the future because the area is designated as open to livestock grazing in the Spokane District Resource Management Plan (RMP), as amended (BLM 1987). Motorized recreation use is expected to increase due to increased popularity and population growth. The McNary and Badger Canyon parcels are open to, and heavily used by, off-highway vehicles (OHV), and disturbance to native plant communities is ongoing and expected to continue. The Horse Heaven Hills parcels are designated as "limited to designated routes" (BLM 1987), and currently OHV users generally use existing routes thereby limiting disturbance to native plant communities. However, new user-created trails and off route disturbance to native plants communities does occur and is reasonably expected to continue. Rights-of-ways will continue to be renewed in the McNary West fuel break and in the transmission line corridor between the Yakitat and Benton Exit fuel breaks. These activities would create further niches and vectors for noxious weeds and invasive plants when ground disturbance occurs; thus, increasing the acres occupied by noxious weeds and invasive plants.

Cumulative effects from herbicide treatments on native plant communities and rare plants has been analyzed in the Spokane NIMP EA (p. 91, 95). Herbicide treatments would reduce the time in which disturbed areas, which overlap other actions, would be susceptible to noxious weeds and invasive plant establishment or expansion and this would aid in rehabilitating or restoring certain areas to better ecological condition. (BLM 2018, p. 91). Sensitive species sites that currently face threats from noxious weeds would see a reduction in those threats. (BLM 2018, p. 95). Wildland fires and fire suppression activities has in the past and would continue to remove vegetation, creating a potential niche for the establishment and expansion of noxious weeds and invasive plants (BLM 2018). The effects of the proposed action would reduce the impact of future wildfires and wildfire suppression activities to native plant communities and BLM sensitive plants when the desired conditions are met, and fire frequency is reduced. It is not known how effective the fuel breaks will be, how many fires will occur, or how many fires will be stopped by fuel breaks, and thus it is not known how much the native plant communities in between the fuel breaks would benefit, but the main benefit to native plant communities would occur when fire frequencies are increased to 12-15 years or greater (Brown et al. 2000). Post fire ESR treatments would reasonable be expected to continue where wildfire impacts are severe, and these would assist in native plant recovery where needed. When native plant communities reach their desired condition, ESR treatments would become less necessary.

In conclusion, the effects of establishing the eight fuel breaks would result in longer fire return intervals in the surrounding landscape thus promoting healthy shrub components, intact biotic soil crusts, and the maintenance of late successional perennial bunchgrasses like bluebunch wheatgrass. Disturbance related effects from the use

of prescribed fire and handlines would stimulate seed production of herbaceous species including invasive annual grasses and invasive annual forbs. Reductions in big sagebrush and bitterbrush and an increase in rabbitbrush will occur in fuel breaks. Sensitive species sites such as *Texosporium,* and rare mosses will be protected by spatial buffers.

Alternative 2 with Targeted Grazing

Direct and indirect effects to vegetation from this alternative include,

1. initial prescribed burning of shrub-steppe vegetation in fuel breaks between October 15 March 15 (1289 ac),
2. repeated burning of fuel breaks when conditions exceed fuel model GR-1 (assumed to occur every 3 years),
3. pre-emergent broadcast applications of imazapic for cheatgrass control,
4. post-emergent broadcast applications of clopyralid and/or aminopyralid for knapweed control.
5. construction and seeding of 3-foot-wide handlines (41,488 linear ft),
6. seeding of native grasses and forbs fuel breaks,
7. the potential for change to a longer fire regime outside of fuel breaks.

And in addition…

8. High intensity, short duration grazing during October 15th to March 15th by cattle, sheep and/or goats.
9. Exclusion of grazing when recovery of existing vegetation and protection of news seedings is necessary.

The direct effects of grazing from October 15 – March 15 would be the utilization and consumption of palatable plants and the avoidance by livestock of non-palatable plants. This would be in addition to the effects of prescribed fire and handlines that would stimulate seed production of herbaceous species including invasive annual grasses and the use of pre-emergent herbicide and seeding. Targeted livestock grazing would aim at utilizing palatable plants before critical growth season of native perennials such as bluebunch wheatgrass and Indian ricegrass. However early season perennial grasses such as Sandberg's bluegrass and Cusick's bluegrass would also be grazed thus reducing their growth and seedset. This could have detrimental effects on Cusick's bluegrass, which is susceptible to grazing impacts and is known to decrease when grazed in its critical growth period. Since this bunchgrass is rare and part of the Washington Natural Heritage Program (WNHP) rare and high-quality ecosystem representing the Wyoming big sagebrush/bluebunch wheatgrass with Cusick's bluegrass (*Poa cusickii*) plant association in good to excellent condition, the decline of this species would reduce community diversity and the importance of this rare ecosystem. Less palatable species such as Sandberg's bluegrass, needle and thread, Thurber needlegrass, sand dropseed, and Medusa-head rye would increase in cover and density. Utilizing winter and spring grazing, prior to cheatgrass and Medusa-head rye seed dispersal could reduce the density and cover of these species over time (Finnerty and Klingman 1962). However, the perennial grasses (with similar phenology to cheatgrass, i.e., Cusick's bluegrass) could also be impacted where present (Murray 1971).

Depending on whether cattle, sheep, or goats are used would affect the vegetation differently. Cattle prefer taller grasses, while sheep prefer forbs, shorter annual grasses and weedy species, and goats will browse shrubs such as sagebrush, bitterbrush, and rabbitbrush. Cattle tend to graze in a more uniform manner compared to goats and sheep, which prefer different forage types. This uniform grazing helps manage dense grasslands effectively, particularly in areas dominated by invasive grasses like cheatgrass. Therefore, sheep may consume more of the less desirable species, but due to their ability to graze close to the ground could cause more damage if not closely monitored.

Because the critical period for native bunchgrasses is from April 24 to June 16 most native perennial bunchgrasses (except for *P. Cusickii*) would be able to grow and set seed. Fall grazing would also reduce litter, which some studies suggest may reduce germination of cheatgrass. Fall and winter grazing may reduce cheatgrass seed abundance by grazing plants during its growth period thus limiting the number of seed stalks that grow to maturity. However non-palatable forbs such as tumble mustard, Russian thistle, Dalmatian toadflax, knapweeds, and rush skeletonweed would also be favored due to the reduction in competition provided by palatable species that normally dominate the vegetation.

Biotic crusts (a thin layer of lichen, moss, cyanobacteria, algae, and microfungi) play a crucial role in soil stabilization, nutrient cycling, and water infiltration, as well as being important for increasing soil fertility, and capturing carbon. Biotic crusts are very fragile, and their structure and integrity can be damaged or destroyed by heavy trampling. By adding high intensity, short duration grazing to the proposed action biotic crust in the fuel breaks would decline. Within proximity to water troughs (100-300 ft.) trampling would be severe enough to result in the permanent loss of biotic crust impacting the ecosystem processes they provide. Since biotic crust has been shown to compete with cheatgrass, an increase in cheatgrass or other weeds is likely in trampled areas. In the Benton Exit fuel break, one known occurrence the BLM sensitive lichen *Texosporium sancti-jacobi* (woven-spore lichen, BLM Sensitive) would be at risk of expiration. There are 12 known sites, so 8% of this rare, globally imperiled lichen would be jeopardized. Since the fuel breaks have not been inventoried for *Texosporium*, there could be other *Texosporium* sites that could be damaged since avoidance may not always be possible with livestock water locations and high livestock use areas. This is especially likely in the Benton Exit fuel break where, because of incomplete surveys and similar aspect, soils, and vegetation type, the *Texosporium* site record states that "the larger area seems like potential habitat." In the McNary fuel breaks, 22 known sites of the rare mosses *Bryoerythrophyllum columbianum*, and 4 sites of *Aloina bifrons* would be at risk of damage from trampling.

Cumulative effects would include those cumulative effects discussed above for the proposed action, and in addition the effects of selective grazing pressure on palatable species that would reduce cheatgrass and those native species identified as palatable (bluebunch wheatgrass, Cusick's bluegrass, and Indian rice grass). Dormant season grazing as proposed would have a larger effect on Cusick's bluegrass because of its early season growth period. Because cheatgrass is better at responding to repeated disturbance caused by OHV activity combined with the repeated fire and grazing, the cumulative effect to native plant communities, invasive weeds, and rare plants of this alternative would be greater than that of the proposed action. Repeated trampling and grazing by livestock following repeated burning in the fuel breaks in combination with the presence of noxious and invasive weeds could reduce the treatment effectiveness of pre-emergent herbicides that control cheatgrass, cause a decline in Cusick's bluegrass, and damage to the biotic crust layer including *Texosporium* and rare mosses. In addition, the removal of shrubs would overtime become complete especially for fire sensitive shrubs like bitterbrush and big sagebrush especially if goats are used to consume any remaining shrubs. Reduced diversity and resilience caused by the combined disturbances would require increased efforts of weed control and increased ESR activities after wildfire and reduce the ecological value of existing native plant communities.

In conclusion, the effects of establishing the eight fuel breaks with prescribed fire and targeted grazing would result in longer fire return intervals in the surrounding landscape, but with the addition of targeted grazing, could cause a decline in Cusick's bluegrass (an important component of the Washington Natural Heritage Program (WNHP) rare and high-quality ecosystem) and damage biotic crusts including *Texosporium* and rare mosses. The shrub component, even fire tolerant shrubs, and those that survived prescribed fire would be reduced more in this alternative because of the use of goat browsing making this alternative more damaging to native plant communities than the preferred alternative.

3.4. Issue 4 – How would the proposed treatments affect grazing authorizations?

Affected Environment

The analysis area for livestock grazing management includes all allotments that intersect the proposed action fuel breaks shown in Maps F.13 and F.14. Project boundaries are generally known by the area name of Horse Heaven Hills and McNary Parcels. Allotments in the Horse Heaven Hills include OR00540 and OR00544; allotments within the McNary include OR00585. The parcel within the proposed action *Badger* fuel break is an unallotted piece of BLM-administered land. The three grazing allotments are approximately 7,200 acres.

Grazing permits or leases are issued based on the expected AUMs that the allotment can support without damaging soil or vegetation resources. Management of livestock grazing is authorized through leases and is commonly carried out through the development and implementation of allotment management plans or equivalent plans establishing terms and conditions. Allotment management plans further outline how livestock grazing is managed to meet multiple use, sustained yield, and other needs and objectives, as determined through land use plans.

Allotments OR00540 and OR00544 (Horse Heaven Hills) are managed as an Improve (I) allotment. The Horse Heaven Hills' allotments do not have current grazing authorizations at the time of this EA. These allotments are identified as available for livestock grazing in the 1987 Spokane RMP. The 1997 Environmental Assessment for Horse Heaven Hills Allotment Management Plan (OR-135-07-09), identifies 2,199 acres available to grazing and 2,211 acres fenced and excluded from livestock grazing, recognizing the high quality of historic vegetation communities.

Allotment OR00585 (McNary) is managed as a Custodial (C) allotment and has a 10-year grazing authorization for livestock grazing. The allotment consists of four scattered tracts intermingled with privately owned lands. Livestock use is from cattle at various times throughout the year due to its location surrounding large privately owned lands. Use within the identified fuel break areas has historically been low and dispersed, as livestock watering is on adjacent private land.

Table 9 summarizes the grazing allotments for the project area. Grazing allotments are subject to land health assessments. The purpose of the land health assessment and evaluation process is 1) to assess the current ecological condition of BLM-administered lands by synthesizing available data and information and 2) to evaluate whether current conditions are achieving the applicable Oregon/Washington BLM Standards for Rangeland Health. Where one or more of these standards are not achieved, the BLM will then 3) determine the significant causes and propose appropriate management changes (USDI 1995).

Table 9. Authorized grazing use within the project area.

Allotment	Management Category	Allotment Acres	Livestock Kind	Season of Use	AUMs	Percent of Allotment to be converted to fuel breaks
OR00540	Improve	5829	NA	NA	333	11%
OR00544	Improve	692	NA	NA	64	~1%
OR00585	Custodial	662*	Cattle	3/1-2/28**	43	65%

Allotments not authorizing current lease state AUMs available. The amount an average cow and calf consume in a typical one-month period is estimated to be 800 pounds and is referred to as an Animal Unit Month (AUM).

*Acreage is total of four BLM parcels. Proposed action is 2 entire parcels out to the 4 parcels within private lands.

** The unfenced BLM lands surrounding high percentage of private lands. Grazing occurs various times of year.

Environmental Effects

No Action Alternative

The No Action alternative would result in no fuel breaks being constructed in the project area. Authorized livestock grazing would not be affected and continue as authorized on the allotments unless otherwise by wildfire. Rest from livestock grazing after wildfire would be occurring through individual fire recovery plans. Current fire regime would continue in a mosaic state and would maintain vegetation in an herbaceous state, which would provide greater forage production and availability. However, repeated fire can also degrade plant communities, removing perennial vegetation favoring invasive annual plants which respond rapidly following wildland fire (Foster, et al., 2015).

The Horse Heaven Hills area would remain ungrazed from livestock unless authorized through fully processing a 10-year permit applicable to Rangeland Health Standards and Guidelines for Livestock Grazing Management (USDI 1997). The McNary parcels would remain at current grazing levels.

Alternative 2 - Proposed Action

Planned prescribed fire treatments would initially have a negative, short term direct impact on currently authorized livestock grazing. The treatment area would be temporarily excluded from livestock grazing during seeding treatment. The proposed action would affect approximately 11% (~655 acres) of the OR00540 allotment, 65% (~429 acres) of the OR00585 allotment and 1% (~69 acres) of the OR00544 allotment. Forage in the treatment area primarily would not be available for consumption by livestock in the short team. Large continuous burned areas within allotments result in significant impacts to livestock operations, forcing operators to relocate livestock or find other means of providing livestock forage while the burned areas are being rested from livestock grazing, allowing vegetation to recover.

Prescribed fire would reduce the cover of grass and forb species available to livestock temporarily. Prescribed fire would increase the palatability initially for livestock grazing, but repeated fire would reduce the bunchgrass density, size and vigor. Livestock near treatment areas could be temporarily disturbed or displaced by prescribed fire activities and associated traffic.

The treatment areas are expected to increase the palatability of perennial grass resulting in increased forage availability from the removal of dead fine fuels. The risk of catastrophic fires would be reduced, both of which would have a positive, long term indirect impact on livestock grazing.

Seeding and herbicide applications would aid in the recovery of the fuel breaks and provide competition against invasive species. Successful seeding treatments would increase quality and amount of herbaceous forage. However, seeding treatments will affect livestock authorizations when excluded from areas to establish seedings, typically two growing seasons. Alternative to totally exclude livestock by means of temporary fencing, avoiding livestock grazing in newly seeded areas could be accomplished by limiting water sources adjacent to the newly seeded areas, active herding, temporary protective fencing, altering rest-rotation schedules, or deferring use to late fall/winter. In extreme cases when a substantial portion of a pasture is involved, temporarily closing the entire pasture may be required.

BLM has received application for grazing preference on allotments OR00540 and OR00544. In order to process the grazing application, a Rangeland Health assessment and evaluation are necessary to determine the condition and allocation of available forage. Maintenance of proposed action areas would continually exclude livestock forage from future authorizations during seedling establishment. Overall, cumulative effects to livestock grazing management from the action alternatives are expected to be to be uncertain and may interfere with the allotments' ability to meet ORWA Rangeland Health Standard 3: Ecological Processes and Standard 5: Native, T&E, and Locally Important Species (USDI 1997) due to vegetation response to repeated fires (3 years minimum) with in the treatment polygons in relation to the percentage of the allotments. The Horse Heaven Hills area would remain ungrazed from livestock unless authorized through fully processing a 10-year permit applicable to Rangeland Health Standards and Guidelines for Livestock Grazing Management.

The McNary fuel breaks encompass the majority of the BLM-administered lands where repeated prescribed fire may prevent the allotments at issue from meeting or making significant progress toward meeting standards

when conducting Rangeland Health assessments required for grazing authorizations in respect to increased invasive species due to repeated fire alone. Prescribed fire with herbicide application and seedings may increase desirable species and may make significant progress toward meeting ORWA Rangeland Health Standard 3: Ecological Processes and Standard 5: Native, T&E, and Locally Important Species (USDI 1997).

Additionally, without the integration of targeted grazing, the forage would be removed by each prescribed fire treatment subject to vegetation rest for recovery. Livestock management may result in complete removal or more fencing to exclude livestock from treated areas.

Alternative 2 with Targeted Grazing

Direct and indirect effects to livestock grazing from the Targeted Grazing Alternative include:

1. Livestock availability and numbers
2. Livestock concentrated in fuel breaks (725 acres in Horse Heaven Hills and 564 acres in McNary) between Fall and Spring.
3. Repeated grazing of fuel breaks to achieve average stubble heights of 2-3 inches on invasive annual grasses and 6-8 inches on native perennial grasses or when conditions are at a GR2 fuel model.
4. Construction of temporary fence, water, and supplement locations.
5. Herding.

Targeted grazing added to the proposed action would be to utilize a biological method in conjunction with prescribed fire to reduce fine fuel loads, fuel continuity, and to lessen the repeated effects on vegetation that prescribed fire only would have in the proposed fuel break areas. Because of the feasibility of targeted grazing for each fuel break area, the Badger and McNary areas would most likely be affected by this alternative. BLM will retain the ability to cease use of the targeted grazing tool at any time if BLM determines is not effective or desirable for any reason.

Conflicts between targeted grazing and regularly permitted livestock are not anticipated. Targeted grazing would occur with the coordination of current grazing lessees to increase and localize grazing for short duration until objectives are met. Targeted grazing on annual plant species provides adequate early season forage but become unpalatable quickly and does not produce the same quantity of forage produced by perennial plant communities (Mosley & Roselle, 2006). Spring grazing with livestock concentrated in the fuel breaks would reduce fine fuel continuity. Fall grazing would reduce fine fuel loading. A substantial amount of time would be spent assessing livestock grazing in the treatment areas to ensure livestock are removed when the fuels treatment objective is met.

In addition to the increased management required (temporary fencing, water, supplements, herding), there would also be a higher level of uncertainty from year to year, with limited amount of time to plan the targeted grazing operations on an annual basis. In years where cheatgrass production is substantial, the producer may need to acquire additional livestock quickly in order to be able to adequately treat the fuel break areas.

Because of the feasibility of targeted grazing for each fuel break area, the Badger and McNary areas' livestock grazing activity would increase. Grazing success depends on the quality and amount of forage available during the targeted grazing season. The targeted grazing alternative would not change permitted grazing on existing authorizations including, for example, animal unit months (AUMs), season of use, numbers and types of livestock. The cumulative effects of past and ongoing activities combined with the targeted grazing action would result in a beneficial increase in the transitory range availability and livestock distribution on most of the project area.

In the long term, the livestock operator would be expected to benefit from having larger areas of the permitted allotment(s) largely protected from repeated fires and in a perennial vegetation community state. Livestock grazing decisions and associated permits for the allotments in the analysis area include grazing schedules and

terms and conditions to achieve or make significant progress toward meeting ORWA Standards for Rangeland Health and Guidelines for Livestock Grazing Management (USDI 1997). Project implementation may affect livestock grazing, temporary loss of AUMs where seeding treatments are used for fuel break development.

Actions that could cumulatively affect livestock grazing authorizations are wildfire, invasive plants, post-fire stabilization and rehabilitation treatments. Targeted grazing, along with prescribed fire, would both temporarily reduce the amount of available vegetation for livestock grazing in fuel breaks that overlap grazing allotments. Invasive plants can reduce the availability of preferred forage for livestock grazing. Since wildfires cannot be predicted, there is still the likelihood of areas outside of the proposed treatment areas burning. In the event of a wildfire, livestock grazing generally ceases for a period of two growing seasons to allow for vegetation recovery.

The Proposed Action Plus Targeted Grazing would reduce fire intensity and behavior, keeping the public and firefighters safer, reducing adverse impacts to property and resources. This alternative would also reduce negative impacts to the areas outside of the proposed fuel breaks. With the addition of targeted grazing the overall effectiveness of the proposed treatments would increase.

3.5. Issue 5 – How would the proposed treatments affect recreational use during and after implementation?

Affected Environment

Currently, there are no developed BLM recreation facilities, or dispersed recreation sites on the scattered BLM-administered lands within the project area.

Horse Heaven Hills land units: A trailhead parking lot with information kiosk exists along McBee Road, adjacent to the project's "McBee" treatment polygon. And a network of well-established user-created trails exists within the primary/largest contiguous BLM land unit, several of which are mapped on the current BLM Horse Heaven Hills area public information map. Hikers also utilize existing developed and primitive road routes and/or hike cross-country while on BLM-managed lands within the project area. Benton County roads access the two land units which contain treatment polygons, and legal public access to BLM-managed lands is limited to traveling on public roads (Benton County, BLM) or hiking across BLM lands. Recreational visitor use is dispersed, consisting of local casual use, mostly hiking, plus recreational shooting, mountain bicycling, and off-highway vehicle (OHV) use and horseback riding. The OHV Area designation for the Horse Heaven Hills area is "OHV Limited" (vehicle travel limited to designated routes; no off-route travel allowed). Mechanized/non-motorized use (including bicycles) is allowed cross-country. Border Field Office currently administers two special recreation permits (SRPs) under multi-year authorizations within the project area: 1) the Badger Mountain Challenge ultra-foot race, held the third weekend in March annually (+250 participants), and 2) the Quad Killer Vertical Kilometer Race, also a foot race (in which solo participants track their individual time and distance), held the first two full weeks of October annually (currently ~50 participants). In recent fiscal years, based on observation, BLM has reported an annual average of 20 non-SRP recreational use visitors per day (7,300 visits per year) to Horse Heaven Hills.

McNary land units: These two land units are heavily used for target shooting and OHV use. Especially the east parcel is popular for OHV use because part of it is sand dunes. Some hiking and camping use also occur. Benton County roads provide excellent public access to the two land units, and Hermiston, Oregon is just 10 miles away. The OHV Area Designation for the McNary land units is "OHV Open" (vehicle overland travel allowed). And Mechanized/Non-Motorized use (including bicycles) is allowed cross-country. Since, as remote small parcels these areas receive little BLM maintenance, the baseline for this unit is that trash accumulates and remains long-term, therefore providing a lower quality of recreational experience than at Horse Heaven Hills. Border Field Office currently administers no special recreation permits (SRPs) at the McNary land units.

Environmental Effects

No Action Alternative

Entire Project Area: Fuels reduction treatment activities on BLM-administered lands, other government lands, or private lands would not occur, or would be substantially smaller in scope, resulting in continued current trends, including routinely occurring widespread wildland fires. Recreational values, including quality of recreational experience and visitor safety, would increasingly be negatively impacted. including quality of recreational experience, and visitor safety. Also see Section 3.2 regarding impacts to Recreating Public from the use of herbicide treatments.

Horse Heaven Hill land units: Negative effects from firefighting activities would increase over time. New fire containment dozer lines, if not decommissioned after a fire, could lead to an increase in off-highway vehicle use both on-route, and potentially illicitly off-route, that would decrease quality of recreation experience for non-motorized users, and become a source of user conflicts.

McNary land units: Negative effects from fire-fighting activities would increase over time. New fire-containment dozer lines, if not decommissioned after a fire, could lead to an increase in OHV use on those routes potentially shifting motorized use to segments of these land units not previously popular for that use. That is likely to decrease quality of recreation experience for some non-motorized recreation visitors but is unlikely to become a source for user conflicts, given the "OHV Open" designation.

Alternative 2 - Proposed Action

Horse Heaven Hills land units: The fuels project would temporarily impact visitor use of the McBee Road BLM trailhead and parking lot access point and the trails network that stems from it, during treatments to the "McBee" treatment polygon. That parking lot and trail network stemming from the trailhead are also heavily used, and designated for use, by both special recreation permit events. Additionally, dispersed hiking (cross-country and trail) within the other treatment polygons would be temporarily impacted during treatments, and for a short time after treatments.

Herbicide treatments would impact hiking for typically at least 24 to 48 hours after application, or other recommended interval of non-use following application specific to the individual herbicide(s) used, as detailed in the Spokane NIMP EA, Appendices B and C. Broadcast burn treatments, by blackening the ground with soot, would displace hikers from that area for up to 1 to 3 weeks after treatment. Project actions would temporarily displace hikers to non-treated segments within the project area, potentially forcing hikers who prefer specific established trail routes to resort to alternate trail(s) and/or cross-country travel for part of their hike.

Similar recreational experiences can be found on State and County lands nearby. Fuels reduction across the area would reduce the chances for high intensity wildfires burning over the area, and so better maintain a continuing similar quality of recreational experiences for visitors. Creation of firelines would not impact hiking, other than they potentially could be used as new trails by hikers.

Although hiking occurs year-round, including from the very popular McBee Road trailhead, treatment timeframes occur outside of prime season for that use, and hikers would simply avoid treatment areas temporarily and resume their activities when again possible. So, impacts to hiking on BLM-administered lands would be sporadic and short-term.

Target shooting occurs at roadside locations where BLM lands extend to Webber Canyon Road and West Yakitat Road. Treatment polygons do not intersect with these locations and so project actions would have negligible impacts to target shooting.

The potential exists for an increase in recreational use of dug firelines, used as new trails for hiking, mountain bicycling and/or (unauthorized) motorcycling, especially where the firelines connect to existing routes authorized for OHV use.

McNary land units: Effects would be the same as at Horse Heaven Hills, except:

Because the entire BLM land unit is designated as a treatment area at both land units, including potentially for both broadcast burns and herbicide treatments, all public land recreational activities use would temporarily be displaced during, and for a short time after treatments if done full-scale for the land unit.

Any additional OHV and mechanized (including bicycles) recreational use along dug firelines and dozer lines would have a negligible impact since the OHV area designation is "OHV Open".

Cumulative Effects (entire project area): Within the reasonably foreseeable future, project activities would improve year-round recreational opportunities (notably hiking), the quality of recreational experience for both SRP and non-SRP visitors, and visitor safety on BLM-administered lands within the project area would improve. In comparison to Alternative 1: No Action Alternative, Alternative 2: Proposed Action Alternative would improve recreational opportunities, experiences, and visitor safety, and reduce the likelihood of negative recreational use impacts.

Alternative 2 with Targeted Grazing

Effects would be the same as for Alternative 2: Proposed Action Alternative, except that recreational use visitors, especially when traveling cross-country might choose to skirt any temporary electric fences erected for targeted cattle grazing, to avoid the possibility of electric shock. This could alter a desired (hiking) route. If considering entering any targeted grazing area where either electric or virtual fences were erected, recreationists would need to weigh the possibility of any risks to their personal safety from livestock.

A project design feature allocates a targeted grazing seasonal use period that is outside of the scope of the annual occurrence of the two special recreation permits that would otherwise be impacted by targeted grazing. Cumulative effects would be the same as for Alternative 2.

3.6. Issue 6 – How would the proposed treatments affect visual resource management (VRM)?

Affected Environment

The project area BLM-administered lands at Horse Heaven Hills are designated as Visual Resource Management (VRM) Class II in accordance with the 1980 Spokane District Management Framework Plan (SDMFP), at least for those lands acquired at that time, including the largest land unit within the project area, at that time named "Badger Slope".

The VRM Class II Objective is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.

For the BLM-managed lands inclusive of the two McNary land units, there are no current VRM classes established as part of the Spokane District's existing RMP. Visual Resource Inventory (VRI) classes have been assigned through the inventory process. The project's two McNary land units are designated VRI II. The objective of this class is the same as for the VRM Class II Objective.

A Form 8400-4 Visual Resource Contrast Rating was completed on 1/9/2023, from a single Key Observation Point (KOP) in nearby Benton City, Washington's downtown area on Division Street. The contrast rating from the single KOP is representative for the entire project. Description of visual elements of form, line, color, and texture of the existing visual landscape are described in that contrast rating. See Appendix G for that document.

Environmental Effects

No Action Alternative

Fuels reduction treatment activities on BLM-administered lands would not occur, or would substantially reduce in scope, resulting in continued current trends, including routinely occurring large-scale wildland fires. Dry and

hot summer weather trends are predicted to continue into the foreseeable future. The result, under Alternative 1: No Action Alternative is a continued likelihood of future routinely occurring large-scale wildland fires, within the project area's highly flammable vegetation ecosystem. Subsequently, more negative impacts to visual resource values would occur than under the proposed action alternative, including larger and darker burn scars resulting in a high degree of contrast to, and impairment of, the surrounding natural visual landscape.

Negative effects from fire-fighting activities and vegetation denuding would increase over time, increasing impairment to visual resource values, including impacts to scenic quality and high contrast to the natural vegetated visual landscape from high-intensity burn areas.

Alternative 2 - Proposed Action

Horse Heaven Hills land units: While broadcast burns would temporarily change the appearance of the landscape within the project area, subsequent vegetation regrowth, in some cases with the added benefit of reseeding, would accomplish the area's VRM Class II objective to "maintain the landscape's existing character," in this case by retaining the existing visual vegetative landscape.

Fire is a natural process and as such does not introduce permanent constructed-feature visual effects to the surrounding natural visual landscape. Project effects from individual treatments would be short-term, i.e., less than 5 years, although repeated as often as every 3 years per treatment polygon.

Seven of the past ten years (through 2023), large-scale wildland fire burns have occurred at Horse Heaven Hills. Any fire greater than 300 acres in shrub-steppe is considered a large incident by the Interagency Standards for Fire and Fire Aviation Operations (NIFC 2023). In comparison to Alternative 1: No Action Alternative, Alternative 2: Proposed Action Alternative would lessen the regularity, intensity, duration, and scale of degradation to visual resources including scenic quality and degree of contrast to the surrounding natural landscape.

Broadcast burning with drip-torches within the project's October to March timeframe for treatments would create a darkened-but-not-black, mottled landscape appearance; not the stark blackened appearance of the ground following a hot wildland fire in summer season.

Treatment polygons are defined with one side of the polygon lining up with a ridgetop. The result is that from some viewing angles, the visual aspect could be either hidden from view, or have much more of a shadow aspect appearance with grey and/or muted black colors, rather than a stark blackened landscape appearance in high contrast to the surrounding landscape.

The interval between broadcast burns of individual treatment polygons would typically be at least three years, so visual impacts following burns would be brief, and have a long interval until the next burn treatment.

Due to the high-rising hilltop ridge of the primary land unit within the project area, in an otherwise mostly flat landscape topography, long-term visual effects would be visible from less than 3 miles away to as far as 15 miles away.

The construction of firelines would temporarily attract attention from hikers on the landscape but would not create visual impacts for observers from other locations where people are known to be present. Firelines would be potentially visible only within the foreground distance zone. Most residential, business and commuter observers from the surrounding area would be at least 1 - 2 miles away in the foreground - middleground, from which distance they are unlikely to discern the 1-yard wide firelines.

McNary land units: The effects to visual resources are the same as for the Horse Heaven Hills area except that:

- the temporary visual contrast impacts would be visible for the extent of broadcast burn area boundaries, up to the entire land units for both McNary East and McNary West land units.

- similarly to Horse Heaven Hills, visual effects would be visible primarily from the foreground - middleground as observed from commuter observers traveling nearby I-395 South, and from the town of McNary, Oregon two miles away.

Cumulative Effects (entire project area): Project activities into the reasonably foreseeable future would be more likely to meet VRM Class II and VRI Class II objectives in comparison to selection of Alternative 1: No Action Alternative, by reducing the degree of visual contrast and impairment to natural scenic quality. A lower intensity and duration of landscape blackening would occur due to lower intensity and smaller scale wildland fires under the proposed action alternative. There is no potential that the temporary effects would be significant. Fire is a naturally occurring event and so not subject to management that would assure meeting the VRM or VRI Class objectives for an area. Nevertheless, instead of more severe and longer-lasting visual impacts from wildland fire that would occur under Alternative 1: No Action Alternative, Alternative 2: Proposed Action Alternative's treatments would result in smaller and lower contrast visual disturbance areas. Also, vegetation growth within these visual disturbance treatment areas would rebound more quickly, thereby reducing the duration and severity of impacts to visual quality and contrast.

Alternative 2 with Targeted Grazing

Effects would be the same as for Alternative 2 except that for areas successfully treated with targeted grazing fewer broadcast burns would be necessary, the level of contrast to the surrounding natural visual landscape would be even lower than as would occur with a broadcast burn. Any temporary electric fences erected for targeted grazing are unlikely to create lines visible by most casual observers from points where people are known to be present.

Cumulative effects would be the same as for Alternative 2.

3.7. Issue 7 – How would the proposed treatments affect cultural resources potentially eligible for listing to the National Register for Historical places?

Affected Environment

The project area is located within lands considered by anthropologists as part of the Plateau Culture Area, a large region that extends from central British Columbia south into Washington and central Oregon, and east into Idaho and western Montana (Walker 1998). The broad term "cultural resources" as used in this document refers to historic and precontact districts, sites, and isolates, as well as Native American Traditional Cultural Properties (TCPs) as defined (for reporting purposes) by the Washington State Department of Archaeology and Historic Preservation (WA DAHP) (WA DAHP 2024). Historic-era (or "post-contact") cultural sites in the project area are most commonly associated with homesteading, transportation, irrigation and power development, farming, and sheep and/or cattle ranching activities between the years 1860 and 1970. Historic-era sites are typically (but not always) more visually apparent than precontact sites because they take the form of standing (or collapsed) structures, transportation routes, buildings, and/or surface refuse (artifact scatters, structure foundations, machinery, etc.). In the project area, precontact cultural resource sites include lithic artifact scatters, rock alignments, talus pits, ethnographic villages, and trails. Whether they represent traditional hunting, gathering, or fishing areas, culturally significant landscapes, archaeological sites, and features may all be considered as contributing features central to the overall integrity of a TCP as regarded by indigenous communities. Certain religious or sacred sites can be considered TCPs, as can traditional-use areas where ongoing utilization of a landscape and/or natural resource is rooted in a community's history and continuing cultural identity (Parker and King 1998). TCPs can be affected directly or indirectly by alterations to the physical environment and are afforded the same protections under Section 106 of the National Historic Preservation Act (Parker and King 1998).

Each type of cultural resource site has the potential to be affected (to varying degrees) by both ground-disturbing and surficial activities. In order to comply with provisions of the National Historic Preservation Act of 1966 [as amended] (NHPA), cultural properties listed, eligible for listing, or those currently unevaluated for listing to the National Register of Historic Places (NHRP), must either be avoided by federally sponsored or

permitted actions, or adverse effects to these properties resulting from such undertaking(s) shall be mitigated. Consultations with the WA DAHP, federally recognized tribes, and other public and private landowners will be carried out on a case-by-case basis under this EA by the BLM who is acting as the lead federal agency under Section 106 of the NHPA.

There would be no change in cultural resource management direction by the BLM under any of the alternatives. Ongoing and planned management measures include consulting federally recognized tribes and coordinating with other affected private and public landowners, protecting identified cultural resource areas, managing, and organizing cultural resources records, evaluating, and nominating resources for the National Register (where applicable), and preparing planning and overview documents. Effects would be reduced or avoided by compliance with laws and executive orders designed to protect and preserve cultural resources, including: the FLPMA Sections 103(c), 201(a), and 202(c), the NHPA Sections 106 and 110(a), the Archaeological Resources Protection Act Section 14(a), the Native American Graves and Repatriation Act, the American Indian Religious Freedom Act, and Executive Orders 13175 and 13007. Undertakings, on and off BLM-administered lands, shall follow standard BLM protocol and procedures for identifying cultural resources in compliance with Section 106 of the NHPA. This process includes necessary consultations with the State Historic Preservation Officer (SHPO), Tribal Historic Preservation Officers, tribal leadership, and interested parties as treatments are planned, developed, and implemented.

Environmental Effects

No Action Alternative

Under the No Action alternative, wildfire control efforts by the BLM would continue on a reactionary, emergency response basis. This would increase direct and indirect effects to cultural resources within the project area as fire regimes across the region are expected to rise in frequency and intensity. Numerous studies have been completed to evaluate the effects of fire on cultural resources (Deal 2002; Duke, Cave, and Kimmick 2003, Buenger 2003, Kelly and McCarthy 2001; Lentz, Gaunt and Willmer 1996; Roberts and Landon 2016; Ryan et al. 2012; Shackley and Dillian 2002; Sturdevant et al. 2014; and Winthrop 2004). These studies are applicable to the types of effects that can occur when cultural resources are exposed to any fire, regardless of delivery mechanism (prescribed or uncontrolled). The most common raw materials used to create precontact artifacts in the project area are chert and other cyptocrystalline silicates, groundstone, basalt, and obsidian. Fire can affect stone artifacts through exposure to intense, prolonged temperatures and/or rapid cooling. Stone artifacts may spall, crack, craze, fracture, potlid, or shatter when exposed to lengthy periods of extreme heat. Most tool stones begin to show noticeable damage once direct temperatures of around 650 degrees Fahrenheit are reached.

Historic artifacts, features, and structures can be affected to varying degrees by heat depending on the parent material or complimentary components of which they are made. Cement-mortared fieldstone, cement aggregate, and cinder block are resistant to fire, but cinder block may spall, and lime-based mortar can calcinate, leading to the eventual collapse of standing wall structures (Winthrop 2004). Cans dated to the 19th and 20th centuries are made from rolled, tinned steel and may not melt, but can lose some interpretive value when labels or solder are destroyed though exposure to fire (Winthrop 2004). Potential effects of fire (in general) include the complete destruction of cultural sites, features, and artifacts composed of flammable material (wood, synthetics, and organics) or result in a reduction of the integrity and research value of cultural materials made of stone, mineral, glass, and metal. Pollen grains, which are valuable for paleoenvironmental reconstruction and answering research questions in an archaeological context are completely destroyed when exposed to temperatures above 600 degrees Fahrenheit.

Wildfires impact cultural resources through direct and indirect mechanisms, they can sweep rapidly through a cultural landscape, destroying significant structures and/or features, and emergency fire suppression activities such as dozer line construction can have a direct impact on the integrity of subsurface resources (sites, features, and artifacts). Indirectly, the loss in vegetation cover (of any type) and increased erosion has the potential to expose previously obscured surface artifacts and features, making them more susceptible to unauthorized

collection and/or vandalism (Harmon 2011). Cumulative effects to cultural resources are considered relative to the effects of the alternatives in their relation to other similar plans. These include past, current, and reasonably foreseeable actions within the project area. Ongoing and foreseeable future actions would not affect cultural resources due to consultation and survey requirements designed to identify and protect cultural resources prior to project implementation.

Alternative 2 - Proposed Action

The proactive reduction of hazardous fuels in the project area would benefit the preservation of many cultural resource site types and cultural landscapes through the recovery of fire-resistant vegetation and by decreasing the occurrence of noxious weed and invasive plant species that contribute to wildfire intensity and frequency (Birnbaum 1994, and Halford, Barnes, and Guinn 2016). Ensuring the propagation of native vegetation through seeding and control of noxious weeds and invasive plants is expected reduce the frequency and intensity of wildfires and further reduce impacts to cultural resources associated with fire suppression efforts (BLM 2018). The recovery of native plants through increased noxious weed management within the project area would also result in increased soil stability, benefitting the preservation and management of many types of cultural resources.

The creation, regimented maintenance, and burning of fuel breaks has the potential to directly affect cultural resource sites and landscapes via new ground disturbance, accidental burning of surficial artifacts and features currently obscured by dense vegetation, and visual impacts to known TCPs. Under this alternative there is a potential to cause adverse effects to cultural resources from the construction and active burning of fire lines and fuel breaks. Generally, effects to specific cultural resources are context-dependent and subject to a wide range of factors, including fire duration and temperature and the types of sites present (Winthrop 2004). As a general rule, fire does not affect buried cultural materials directly, and studies show that even a few inches of soil cover are sufficient to protect cultural materials (Oster n.d.). Knowledge of a treatment area's fire history is a useful component in determining the potential effects of prescribed fire to unrecorded cultural resources. Overall, potential adverse effects to cultural resources can be reasonably avoided by working closely with staff archaeologists, the WA SHPO, and tribal communities to develop site-specific burn plans, and by following programmatic design features and SOPs (BLM 2018).

Cumulative effects to cultural resources are the impacts resulting from the incremental impact of the action when added to other past, current, and reasonably foreseeable actions within the project area.

Alternative 2 with Targeted Grazing

Control methods that involve animal grazing have the potential to affect the integrity of cultural resources both directly and indirectly. Few empirical studies have been conducted on the effects of livestock grazing specific to cultural resources. What research has been undertaken has focused primarily on the effects of human and animal trampling on stone, bone, and ceramic artifacts (Gifford-Gonzalez et al. 1985, Nielsen 1991, and Osborn and Hartley 1987). General livestock behavior, such as repeated travel to and from, and congregation around licks, fence lines, water sources, and gates, is known through direct observation to increase soil and sediment erosion and decrease vegetation coverage. Soil and sediment erosion and destruction of vegetal coverage can impact the integrity of subsurface cultural resources through exposure, hoof trampling, and the spatial displacement of artifacts and features. Livestock can also directly damage cultural features through rubbing, which has the potential to collapse fragile structures (such as rock alignments and buildings) and cause pictographs and petroglyphs to fade. The exact degree to which cultural resources are affected by livestock grazing is dependent on several factors, including: the volume (head of cattle) and frequency (rotation) of activity, the development of congregation areas, and any improvements made (adding fence line, gates, or water troughs), and the type of cultural resources present within a specific allotment. High intensity grazing during wetter seasons is expected to increase soil erosion, thus creating a greater potential to affect subsurface cultural deposits via trampling and increasing visibility. Higher visibility of archaeological materials increases the likelihood of opportunistic collection and may even result in illegal pothunting. In addition, the creation of new

trails and congregation areas in high probability landscapes (WA DAHP 2024) has the potential to uncover previously unknown subsurface cultural resources and negatively impact the integrity of a site. The completion of cultural resource inventories prior to the establishment of a grazing area and placement of related structures would minimize the potential for sites being adversely affected. In addition, monitoring for impacts to soil stability and exposure of buried cultural deposits resulting from any connected grazing impacts shall occur on a project-by-project basis, thus further eliminating the potential to effect subsurface cultural resources.

Potential effects for construction of fuel breaks, invasive plants management, and revegetation treatments would be equivalent to those identified under Alternative 2.

Cumulative effects to cultural resources are the impacts resulting from the incremental impact of the action when added to other past, current, and reasonably foreseeable actions within the project area. Ongoing and foreseeable future actions would not affect cultural resources due to consultation and survey requirements designed to identify and protect cultural resources prior to project implementation.

3.8. Issue 8 – How would the proposed treatments potentially affect fossil localities?

Affected Environment

The BLM manages fossils in accordance with the 2009 Paleontological Resources Preservation Act ,16 USC §§ 470aa-11, (PRPA) and under the general guidance of FLPMA to promote their use in education, research, and recreation. Paleontological resources, as defined by 16 U.S.C. 470aaa, 'means any fossilized remains, traces, or imprints of organisms, preserved in or on the earth's crust, that are of paleontological interest and that provide information about the history of life on earth, except that the term does not include— any materials associated with an archaeological resource (as defined in section 3(1) of the Archaeological Resources Protection Act of 1979 (16 U.S.C. 470bb(1)); or (B) any cultural item (as defined in section 2 of the Native American Graves Protection and Repatriation Act (25 U.S.C. 3001)) (PRPA, 2009).' Horse Heaven Hills has been identified as an area with high likelihood of Pleistocene vertebrate fossils within surface deposits of loess and alluvium (Fry, 1969). General locality information suggests areas of high erosion potential such as gullies and road cuts are where fossils are most likely to be found. The 1992 Spokane Resource Management Plan Amendment de-designated the Webber Area of Critical Environmental Concern (ACEC). The Webber ACEC was originally designated for paleontological resources by the 1987 Spokane RMP, but after surveying was completed, it was determined that there were no paleontological resource values at this site (BLM 1992). No recent paleontology research has been conducted in the area, but future investigations are likely.

Environmental Effects

No Action Alternative

Not implementing the proposed treatments would have little direct or indirect impact of fossil resources. If high severity fires occur in the future, increased soil erosion would be expected, which could lead to exposure of new fossil material. High rates of erosion can negatively impact fossil resources by exposing them to the earth's surface where precipitation and wind abrasion cause deterioration.

Cumulative effects to fossil resources from other past, present, and reasonably foreseeable actions in the project areas include current livestock grazing (McNary parcels only), wildfire suppression activities (dozer and disk line creation), rights-of way ROW authorizations, and motorized and non-motorized recreation use.

The effects from each of these would be the unnatural exposure of fossils to the earth's surface where they are more likely to be collected or deteriorate. If soil erosion occurs as a result of any of these actions, fossil resources could be impacted by displacing shallow fossil materials, potentially affecting the scientific value of the material as it is removed from its context.

Alternative 2 - Proposed Action

Some aspects of the proposed action could affect fossil resources. Any ground disturbance in Horse Heaven Hills could reveal previously undiscovered fossil resources. Based on a single survey that took place in the area prior to PRPA (Fry, 1969), fossil material of significance has been found in the geologic units present in the

treatment areas in Horse Heaven Hills. Project design features for prevention of soil erosion and reporting of possible fossils found when conducting ground disturbance would minimize potential impacts to fossil resources.

Noxious weed and invasive plant infestations have long-term negative impacts on fossil localities by displacing native vegetation and increasing the potential for soil erosion, which could lead to an increase in unauthorized collecting and damage. Soil stability overall is expected to improve through the management of noxious weed and invasive plant populations, which would decrease the rate of exposure for buried, fossil-bearing strata.

Low severity prescribed fire alone is not anticipated to affect fossil resources. However, fire line construction could uncover previously buried fossils. If this occurs, erosion and degradation of fossils would be faster than would occur naturally. The types of fossils known to occur in Horse Heaven Hills have been mammoth remains. These bones are easily identifiable and should be reported if found.

The addition of prescribed fire to the past, present, and other foreseeable actions on these parcels is not likely to change current soil conditions. Soils become more susceptible to erosion following wildfire suppression efforts. If treatments efforts are successful, soils would be expected to stabilize, protecting fossil resources in the long term.

Alternative 2 with Targeted Grazing

Targeted grazing could minimally impact fossil resources, by increasing areas of hoof action, resulting in decreased biological soil crusts and increasing likelihood of soil erosion. However, since the areas of targeted grazing are where slopes are not steep, this is not expected to be the main cause of soil erosion and related fossil exposure.

The addition of targeted grazing to the proposed treatments and other foreseeable actions in Horse Heaven Hills is not expected to have a noticeable cumulative effect on fossil resources.

3.9. Issue 9 – How would the proposed treatments affect soil resources?

Affected Environment

The majority of soils in the Horse Heaven Hills areas identified for this project have been mapped as Kiona very stony silt loam on 30 to 65% slopes (46.9%) (NRCS 2023). This soil type is highly susceptible to fire damage and general site degradation, in the form of water erosion.

The McNary area has a variety of dominant soil units, all of which are described as loamy and can be found on slopes from 0 to 65% grade. The dominant soil units are all described by the USDA Benton County soil survey as highly susceptible to fire damage and site degradation mainly in the form of wind erosion.

There are no perennial water sources in the project areas. Ephemeral drainages in Horse Heaven Hills do not lead directly to the Yakima River due to man-made diversions on private land downstream. A recent wildfire may have affected soil stability especially in drainages on steep slopes (such as below McBee Grade) and in areas where off road vehicle use occurred by either firefighting activities or unauthorized OHVs. Areas of predominantly non-native vegetation would also be expected to have altered soil stability from what would have been found historically with native vegetation and associated biological soil crusts.

Headcuts within drainages on the McNary parcels were identified in the field in early 2024. These formed upstream of areas of undercutting by human activities. Additionally, this area has been observed to have an increasing presence of non-native vegetation, which would result in slopes that are unable to withstand erosion from surface runoff following large precipitation events. The Columbia River is downstream, but no direct surface water connections are known.

Environmental Effects

No Action Alternative

No treatments would occur under this alternative to reduce the scale of wildfire within the analysis area. As a result, large wildland fires may continue to occur, removing protective vegetation and damaging biological crust, which reduces soil's ability to resist the erosional forces of wind and water and exposes soils to thermal extremes. Surface soil erosion on steep slopes is anticipated under this alternative because of future expected fires resulting from current conditions on the landscape. Post-fire ESR treatments would help limit soil erosion from burned sites.

Further decreases and/or compositional changes in soil organisms and biological soil crusts would occur in areas dominated by annual grasses and forbs over time. Increases in soil erosion and decreases in soil organisms and biological soil crusts would lower site productivity over the long-term.

Other past, present, and reasonably foreseeable actions affecting soils in the project areas include current livestock grazing (McNary parcels only), wildfire suppression activities (dozer and disk line creation), post fire Emergency Stabilization and Rehabilitation (ESR) treatments such as seeding and herbicide applications, rights-of way ROW authorizations, and motorized and non-motorized recreation use.

The incremental impact of the No Action Alternative, combined with the past, present, and future actions, would not likely change current soil conditions. Soils could become more susceptible to water erosion following wildfires, which may cause an increase non-native vegetation and a reduction in biological soil crust. This would result in less stable soils.

Alternative 2 - Proposed Action

The Spokane NIMP EA discusses the potential effects to soils of noxious weed treatments including herbicide use, seeding, and prescribed fire activities. This discussion can be found in Chapter 4 Environmental Consequences for Soils on page 98 of that EA. Overall, it was found that these actions may negatively affect physical and biological soil parameters in the short term, but successful treatments are believed to improve long term soil conditions in areas of noxious weed infestations. Effects of these actions on areas with pristine, native vegetation should still not negatively affect long term soil stability or productivity with application of the design features listed at the end of this document.

Fireline construction in this project would include ground disturbance along ridgelines and parallel to slopes, creating linear features of bare soil that could create preferential surface pathways for precipitation. Without the selective placement of straw wattles, this may lead to an increase in sediment in the ephemeral drainages found primarily in Horse Heaven Hills. The McNary portion is anticipated to have soils with a high likelihood of wind erosion (NRCS, 2023). The proposed treatments should not cause above average wind erosion with the proposed design features and could improve the current stability of soil material if existing populations of non-native plant species are reduced.

Direct effects to soils are expected to be minimal due to the included project design features that are meant to prevent soil degradation and erosion. These design features include placement of straw waddles, reseeding of disturbed areas, minimizing new ground disturbance as much as possible, and avoiding drainages for active lighting of prescribed fires. Successful implementation of the proposed action should improve soils over time, especially in areas of noxious weed prevalence.

Cumulative effects from herbicide, seeding, and prescribed fire on soils have been analyzed in the Spokane NIMP EA. This analysis is on page 101 of that document and discusses the minimal added influence of these actions on soils in areas that have many public land uses.

Alternative 2 with Targeted Grazing

Targeted grazing, when implemented to manage vegetation and reduce fuel loads, can have immediate impacts on soil resources. The hoof action associated with livestock can lead to the removal of vegetation cover and the disturbance of the soil surface horizon. This disruption can negatively affect biological soil crusts, which play a crucial role in maintaining soil structure and health. The removal of cover and disturbance can result in increased soil temperatures, enhanced dryness, and elevated erosion risk, particularly through wind erosion, with potential for water erosion on steeper terrains (Teague & Dowhower, 2002; Davis, 2004).

Furthermore, the compaction of soil due to trampling can reduce soil porosity and infiltration rates, potentially leading to increased runoff and erosion (Fleischner, 1994). The removal of vegetation also diminishes the protective layer that helps regulate soil moisture and temperature, making the soil surface more vulnerable to erosive forces. Overall, these short-term disturbances can lead to a degradation of soil health and increased susceptibility to erosion events.

In the long run, the effectiveness of targeted grazing as a management tool hinges on the frequency and intensity of grazing practices. For targeted grazing to serve as a sustainable fuel break, it must be consistently applied over the same area each year. This ongoing practice keeps the soil surface horizon exposed and may prolong its vulnerability to erosional processes (Teague & Kreuter, 2020). However, the implications of long-term targeted grazing are complex.

When managed sustainably, targeted grazing has the potential to generate substantial benefits for soil health and ecosystem stability. Enhanced grazing management can lead to increased soil cover, which directly mitigates erosion and promotes higher rates of carbon accumulation in the soil (Teague & Kreuter, 2020). The presence of remaining vegetation provides protection for soil surfaces and biological crusts, thereby reducing disturbances and the negative impacts of temperature fluctuations and moisture loss.

Research indicates that sustainable grazing practices can contribute to improved soil structure, greater water-holding capacity, and enhanced microbial activity, all of which are essential for maintaining soil fertility and ecosystem resilience (Teague & Kreuter, 2011). Targeted grazing would most likely occur in only 3 of the 8 proposed fuel beak locations with a g*ood* feasibility rating, (see Table 4) and an additional 2 locations possibly with a f*air* Feasibility rating.

In summary, while targeted grazing can have both short- and long-term effects on soil properties, the overarching impact is significantly influenced by the management strategies employed. Sustainable grazing practices can mitigate the adverse effects associated with short-term disturbances while enhancing soil health over the long term. Therefore, the addition of targeted grazing to the past, present, and reasonably foreseeable future actions does not increase the likelihood of significant impacts.

3.10. Issue 10 – How would the proposed treatments affect minority/low-income population in nearby communities?

Affected Environment

Consistent with Executive Order 12898, federal agencies are directed to incorporate the concept of Environmental Justice (EJ) into their various mission areas to ensure that no one group of people, especially minority and low-income populations, bear a disproportionate share of negative environmental consequences

resulting from federal decision making. This would include the identification of potentially affected populations, and analysis of the potential impacts to these populations with the intent of avoiding, minimizing, or mitigating the effects to these populations to the greatest extent possible.

The Center for Environmental Quality's (CEQ) Climate and Economic Justice Screening Tool (CEJST) was utilized to identify the presence of disadvantaged communities within the vicinity of the Horse Heaven Hills and McNary Units project areas. Disadvantaged communities are identified as being marginalized, underserved, and/ or overburdened by pollution. For a community to be considered disadvantaged by the CEJST tool, a census tract must meet at least one burden threshold and the associated socioeconomic threshold.

For the Horse Heaven fuel breaks, none of the project areas are located within an identified disadvantaged community. However, disadvantaged communities within proximity are located within the City of Prosser (tract: 5300501170) and the census tract to the northwest of Richland (tract: 53005010703).

For the McNary fuel breaks, the project areas are identified as being located within and adjacent to multiple disadvantaged communities. The project area lies within tract 53005011600, and directly across the river from the City of Umatilla, Oregon (identified as tracts 41059950900 and 41059950800). All of which were identified by the CEJST tool as being disadvantaged communities.

The table below details the burdens which contribute to these identified disadvantaged communities.

Table 10. Disadvantaged Communities within vicinity of the Project Areas.

Project Area	**Census Tract #**	**Burden Threshold**	**Socioeconomic Threshold**
Horse Heaven Hills	5300501170	Lack of Indoor Plumbing	Low Income
Horse Heaven Hills	53005010703	Projected Wildfire Risk	Low Income
McNary	53005011600	Unemployment	Highschool Education
McNary	41059950900	Proximity to Risk Management Plan Facilities	Low Income
McNary	41059950800	Transportation Barriers	Low Income

Environmental Effects

No Action Alternative

Under the No Action Alternative, the impacts to the existing disadvantaged communities would remain consistent with existing conditions. No efforts would be taken towards fuels reduction modifications to the lands within the proposed project areas (Horse Heaven Hills and McNary). Implementation of the No Action Alternative would have no direct impacts these communities, nor exacerbate the conditions consistent with the identified burden categories within Table (insert number). However, "projected wildfire risk" is identified as burden threshold of concern for one of the identified disadvantaged communities. Implementation of the No Action Alternative has the potential for adverse indirect impacts to this community through the increased likelihood of wildfire given projected changes in climate conditions. The intensity of these impacts is dependent on future events and would likely range from minor to moderate depending on the number of fire events and firefighting capability.

Alternative 2 - Proposed Action

Although implementation of Proposed Action Alternative would likely not exacerbate the identified burden threshold categories for any of the identified disadvantaged communities, there is the potential for impacts to these communities due to the proximity to the project areas. Planned activities such as herbicide application, native seeding, construction of fire breaks, and adaptive management would likely have negligible direct impacts on the nearby disadvantaged communities because these activities would be spatially distant and localized to the project area. Prescribed burning has the potential to cause adverse direct impacts to surrounding disadvantaged communities through degradation in air quality. These impacts would be negligible to minor in intensity, depending on existing air quality conditions, and conditions are expected to return to baseline quickly. All applicable protocols and conditions would be adhered to when performing prescribed burns to ensure the safety of these nearby communities.

Overall, the Proposed Action Alternative would have negligible indirect impacts to the identified disadvantaged communities. However, the communities which are at risk for wildfire would likely benefit long term through the decreased likelihood of wildfire in these areas. The proposed activities would reduce the availability of fuel sources and increase firefighting capability. The level to which these activities benefit the surrounding communities at risk for wildfire is dependent on the frequency and overall reduction of wildfire events in the future.

Alternative 2 with Targeted Grazing

Alternative 2 with Targeted Grazing is expected to include the same activities consistent with the Proposed Action Alternative, with the addition of targeted grazing on BLM lands. It is expected that targeted grazing would reduce the overall need for herbicide application, however, prescribed burning may still be necessary to eliminate the range and density of invasive plant communities. Overall, the direct impacts would be consistent with the Proposed Action Alternative, with the intensity being even less so. These impacts would range from negligible to minor and be temporary in duration. The indirect impacts would remain consistent with the Proposed Action Alternative, with expected long-term benefits to disadvantaged communities at risk to wildfire.

3.11. Issues considered but not analyzed in detail.

Issue 1: How would prescribed fire treatments affect air quality, climate change, and contribute to greenhouse gas emissions?

The effects of the proposed treatments are analyzed in detail Sections 3.2, 3.3, 4.3 and 4.4 in the Fuel Breaks EIS. Prescribed fire would have the greatest impacts to air quality, climate change, and greenhouse gases (GHG) compared to the other proposed treatments. However, these effects would be temporary, localized, and intermittent (BLM 2020). On a per-acre basis, emissions from prescribed fire operations are significantly less than unplanned or high-severity wildfires (North et al. 2012).

Since the entirety of this project is within the state of Washington, all prescribed burning approvals for smoke clearances would be submitted to the Benton Clean Air Agency (BCAA) which has been delegated authority from the Washington Department of Ecology (WA DOE) prior to ignition. BCAA would either approve or deny the request based on the process's outlined in their 2022 Smoke Management Plan. If the request is denied, the BLM would not carry out any ignitions. Prior to ignitions being carried out as part of a prescribed fire, a test fire must be carried out as part of the go-no-go checklist established within all BLM burn plans. This test fire is evaluated by the burn boss to determine if conditions are favorable to meet objectives, keep ignitions within the fuel break, and to evaluate smoke conditions and dispersion. If any of these factors are deemed unfavorable, the burn boss would have the decision space to halt any further ignitions and extinguish the test fire.

Overall, it is expected that the Proposed Alternatives would reduce hazardous fuels and increase the firefighting capability within the project areas effectively reducing fires to a smaller size. Reduced fire size and intensity would overall reduce the emission of GHG that could contribute to climate change and would benefit local and

regional air quality over the long term (BLM 2020). Due to the detailed analysis in the Fuel Breaks EIS and the established regulatory guidelines, this issue was not analyzed in detail.

Issue 2: How would project treatments and activities affect BLM sensitive wildlife species and migratory birds of conservation concern (BCC)?
The following BLM sensitive wildlife species and migratory birds of conservation concern (BCC) are known or expected (based on range and habitat) to occur in these parcels. Due to the timing of this project (October 15 – March 15) being outside the breeding season of migratory birds, and due to the design features adopted from the Spokane NIMP EA that protect these species from prescribed fire and herbicide effects. Impacts are generally short-term disturbance mitigated by design features and long-term benefit though increased habitat quality. Imazapic, clopyralid, and aminopyralid and are all considered low toxicity herbicides for ground squirrels and other wildlife and do not require timing restrictions or other mitigation measures (BLM 2018).

Townsend's Ground Squirrel (BLM Sensitive) are known to occur in the Horse Heaven Hills and Badger Canyon Parcels. Impacts to Townsend's ground squirrels will be avoided by standard design features that require pre-project surveys and to avoid prescribed fire in occupied habitat when the ground squirrels are surface active (January 15-June 15).

Ferruginous Hawk (BLM Sensitive) Ferruginous Hawks are known to occur at one active territory (Chandler Butte). Impacts to Ferruginous Hawks will be avoided by standard design features that require avoidance of helicopter/aircraft activity within 1 mile of known raptor nest sites during their breeding seasons. (March 1 - May 31, see Appendix D: Project Design Features).

Migratory birds of conservation concern including Short-eared Owl (BLM Sensitive, BCC), Burrowing Owl (BLM Sensitive, State Candidate), Long-billed Curlew (BLM Sensitive), and Northern Harrier (BCC), Sage Sparrow (BLM Sensitive), Sage Thrasher (BCC) - These species are grassland and shrub-steppe associated birds that may occur in the Horse Heaven Hills and Badger Canyon. Impacts to BCC birds will be avoided by standard design features that prohibit the use prescribed fire during the migratory bird nesting season (May 15 to July 15). Due to the detailed analysis in the tiered NEPA documents and the proposed project design features that would mitigate and significant impacts, this issue was not analyzed in detail.

Issue 3: Any Endangered Species Act (ESA) listed species within the project area?
There are no ESA listed species in the project area. The U.S. Fish and Wildlife Information for Planning and Consultation (IPaC) tool was used to screen the project are for ESA-listed species. The tool identified gray wolf, yellow-billed cuckoo, and bull trout as potentially occurring in the project area. While gray wolves can wonder over vast areas and potentially move though the project area, however there are no records of wolf packs in the Lower Basin and the high levels of anthropogenic activities in the proposed action area would preclude use of the project area by wolves. Yellow-billed cuckoos are considered by WDFW as functionally extirpated from the state with sightings in the State being of only of non-breeding vagrants. The Ebird database was queried, and no cuckoos were documented near the project area. Bull trout inhabit the tributaries of the Columbia River, but no tributaries occur in the project area. Due to the lack of records and suitable habitat for these species, there would be no effect to gray wolf, yellow billed cuckoo, or bull trout.

The Proposed Action in the Spokane NIMP EA was designed to be consistent with the Aquatic Restoration Biological Opinion (ARBOII). No further consultation is required with National Marine Fisheries Service or U.S. Fish and Wildlife Service for BLM actions detailed in this EA, if they are consistent with Design Features in the Spokane NIMP EA.

Design features for fisheries and aquatics with emphasis on ESA-listed fishes have several components:

- Buffer areas with different levels of restriction
- Aquatic/riparian-specific restrictions

Based on conversation with Project Leader, GIS mapping, and personal knowledge, it is here assumed that the only riparian-aquatic system within bounds of the action area is the Columbia River (south of the project). For non-fish bearing aquatic and riparian systems identified during implementation, the BLM will follow design features in Spokane NIMP EA. The relevant design features have been included in Appendix D. Due to low probability of the presence of any ESA listed species, along with the proposed project design features to mitigate any potential impacts, this issue was not analyzed in detail.

Issue 4: How would project treatments and activities affect Wildlife Corridors and Connectivity?
This action would not include the construction of any manmade structures, such as a highway or a dam, that would impede the long-term natural movements or migration of terrestrial or aquatic species in the area. Any fencing utilized for the implementation of targeted grazing would either be virtual or temporary. There would be the short-term (1 year) impacts associated with the prescribed burns resulting in the lack of cover for wildlife movement. Cover is expected to return to pre-burn levels in one growing season due to the annual growth of herbaceous vegetation. Long-term, native plant communities may be degraded within fuel breaks, and native plant communities may improve between fuel breaks due to reduced fire, but because all areas would remain shrub-steppe habitats they would continue to act as corridors for wildlife. Due to the project design features, and the use of temporary fencing infrastructure associated with any potential grazing implementation, this issue was not analyzed in detail because there is no potential for substantial impacts.

Issue 5: How would project treatments affect National Historic and Scenic Trails, National Conservation Areeas, Wild and Scenic Rivers, Wilderness/WSA, and Areas of Critical Environmental Concern (ACEC)?
Currently, none of these designations exist within the project area. However, the area includes land that has been nominated and evaluated for potential designation as an ACEC. These designations are made through the BLM's land use planning regulations (43 CFR Section 1610.7-2) and become official when a decision is issued as part of a resource management plan, revision, or amendment. Although a revision to the Spokane RMP was initiated in 2010, no formal decisions were made to implement new management guidelines. As a result, the project area is still managed under the 1987 RMP, as amended, which does not designate it as an ACEC according to current BLM land use planning regulations.

4. Consultation and Coordination

4.1. Individual/Partner Coordination

Partnering agencies and organizations:

United States Army Corps of Engineers, Walla Walla District

Kennewick Irrigation District

Agencies coordinated with:

Benton County Fire Protection District 2

Benton County Fire Department 1

West Benton Fire Rescue

Washington Department of Natural Resources

Benton-Franklin Conservation Districts

4.2. Tribal Consultation

In order to meet its obligations under Section 106 of the National Historic Preservation Act of 1966 [as amended] (NHPA) and agency-specific consultation policies, the BLM has formally consulted (as the lead federal agency) with the Washington State Department of Archaeology and Historic Preservation (WA DAHP), the Confederated Tribes of the Umatilla Indian Reservation (CTUIR), the Confederated Tribes and Bands of the Yakama Nation, the Confederated Tribes of the Warm Springs, and the Wanapum Band of Indians on the area of potential effects (APE) for the range of actions proposed on January 24, 2024. Findings of effects determinations will be consulted on with these same parties on a case-by-case basis and prior to the implementation of any proposed action with the potential to adversely affect cultural resources.

4.3. Other Agencies Consulted

Washington Department of Natural Resources (DNR), Natural Heritage Program. Mr. Joe Rocchio, Program Manager, Mr. Tynan Ramm-Granberg, Vegetation Ecologist, and Mr. Dave Wilderman, Natural Areas Ecologists were consulted on the proposed action and were asked to provide condition information on the mapped rare/high quality occurrence of shrub-steppe vegetation and the globally rare lichen at Horse Heaven Hills. They expressed support for using existing two tracks but recommended moving the proposed Webber fuel break to the east on southern-easterly facing slopes to avoid the higher quality shrub-steppe on the north facing slopes. They also expressed concern for the proposed 3-year re-burn interval for fuel breaks and suggested pushing the interval to 5 years if possible. The five-year burn interval was taken under consideration by the IDT but was not adopted because this minimum would not meet the purpose and need of the proposed action based on the estimated growth rates listed in the ecological site description (ESD) of the project area. The ESD estimates that loamy soils would produce 900 pounds of vegetation growth on an average year (NRCS 2004). Assuming this average, any given fuel break would exceed the fine fuel loading threshold of GR 2 by year three at this rate. Therefore, if the project were to adopt a five-year burn interval minimum, during years four and five, the fuel break would not be effective. The objective of the project is to extend the burn interval as long as possible, and the multifaceted treatment approach hopes to achieve this, but the five-year interval is too long of a timeframe to utilize as a baseline.

U.S. Geological Survey (USGS). Mr. Douglas Shinneman, PhD, Research Ecologist and Mr. Matt Germino, Supervisory Research Ecologist were consulted on the proposed action. They indicated that burning may be risky (in terms of maintaining healthy vegetation) depending on the existing level of invasive annual grass and that patchy perennial grass with >10% cheatgrass may have a poor response to prescribed fire if the site is south facing, has shallow soils, low elevation, or has just been through a drought. For these reasons, the proposed Webber fuel break was not relocated from its current northerly aspect to a southeasterly aspect.

4.4. List of Preparers

Paul Ratcliff	Project Lead – Fire Management
Jason Lowe	Wildlife Biologist
Sarah Doyle	Geologist
Christopher Shafer	Range Management Specialist
Stephen Smith	Outdoor Recreation Planner
Jamie Litzkow	Archaeologist
Lindsey Pruett	Planning & Environmental Coordinator

Appendices

A. Public Comments

On September 29, 2023, the BLM notified the general public that the Border Field Office was proposing to conduct hazardous fuels treatments via the BLM's ePlanning site. The scoping package included a general decription of the Proposed Action and project maps. The BLM encouraged the public and stakeholders to review the scoping information and provide input on this proposal via the project webpage at https://eplanning.blm.gov/eplanning-ui/project/2026784/510, during the public scoping period (September 29, 2023, to October 13, 2023). The BLM received six comments through the ePlanning site. The comments and how they were addressed is included in this appendix.

1. **If controlled burns are conducted in October would seed sources be lost to foraging small birds such as Sparrows, Juncos, and Finches? Would inventories of the type and abundance of seeds be conducted prior to the fire breaks to determine if postponing might be best? postponing to a later date and utilizing smaller sections of the proposed location be better?**

Some seeds would be consumed by controlled burns in October. However, many seeds are expected to survive due to the short duration, low intensity, and mosaic pattern objectives for the fire (see Proposed Action). Remaining plants are expected to be stimulated by fire, and seed production is expected to increase in subsequent years. Postponing to a later date would affect the migratory bird nesting season and conflict with needed cool weather prescription windows required for low intensity prescribed burning.

2. **Comments were received in a letter form. From this letter, members of the IDT identified five main concerns:**

That the increased fire frequency proposed to create fuel breaks would reduce plant community resilience and increase invasive and noxious weeds.

Addressed in the analysis of Section 3.3

That the use of imazapic would negatively affect Sandberg's bluegrass and perennial forbs.

Addressed in the analysis of Section 3.3

That prescribed burning between October and April would reduce the density of Sandberg's bluegrass and biotic crust species.

Addressed in the analysis of Section 3.3

That the seed mix does not accurately represent the species commonly found in the Horse Heaven Hills.

Jason Lowe and Paul Ratcliff of the IDT meet with members of the of the organization at the Horse Heaven Hills area of the project on December 12th, 2023. The group discussed the contents of the seed mix for both the Horse Heaven Hills and McNary areas of the project. The seed mix was adjusted to include more site-specific species that better suit the native plant communities from the valued input and expertise of the organization.

That the Horse Heaven Hills represents an important and intact native plant community not found elsewhere in the Columbia basin.

Addressed in the analysis of Section 3.3

3. **Would the Yakitat fuel break better serve its purpose if it was located ¾ miles west?**

When designing the location of the individual proposed fuel breaks, project developers considered many factors. It is nearly impossible to predict exactly where a fire may originate from and place a fuel break in precisely the right location. Extreme fire conditions can make any fuel break ineffective. However, the overall design aims to compartmentalize the landscape of Horse Heaven Hills and break up continuous fuel beds in the McNary area. Even though the McNary fuel breaks are disconnected they still serve a valuable purpose and effectively stop or slow fire progression by changing the fuel complex available to the fire as it progresses (Finny 2001). Project developers utilized the 2018 Pacific Northwest Quantitative Wildfire Risk Assessment, consultation with the BLM Oregon/Washington State Fire Ecologist, input from the interdisciplinary team, and historical fire data to establish the footprint of this proposed project and its design features. Ridgelines and areas that were previously disturbed by suppression activities or existing features such as roads or trails were selected as much as possible. Ridges serve as better topographical holding features compared to draws or drainages in most instances.

Previous disturbances and existing features were selected to reduce the amount of ground disturbances and addition of visual lines on the landscape. This is due to the Visual Resource Management (VRM) class II rating of the Horse Heaven Hills area. As well as the concern that newly constructed handlines would potentially be used for unsolicited recreation trails for hiking or motorized off highway vehicles. By relocating the Yakitat fuel break to the west, it would be directly adjacent to the Yakitat Road which would provide easy access to the public for these unwanted activities. There are also no areas of existing features or previous disturbance to use for control lines and no well-defined ridgelines that are oriented north to south.

4. Comment provided support of the overall project and the use of herbicides but opposed the use of targeted grazing. Comment identifies concerns with the use of targeted grazing and the potential effects on soil erosion and the introduction of invasives weeds.

Potential effects to soil erosion are addressed in Section 3.9
Potential effects of targeted grazing on invasive species are addressed in Section 3.3
The uses of targeted to mitigate invasive species is addressed in Sections 3.1, 3.3, and 3.4

5. Please protect any ESA listed or other special status species that may be affected by this proposed action.

Potential effects to any ESA listed or special status animal species is analyzed in brief in Section 3.11, Issue 3. Project design features included in this EA mitigate any significant impacts.
Potential effects to any ESA listed or special status plant species is analyzed in Section 3.3. Project design features included in this EA mitigate any significant impacts.

6. **Comment stated that increased public use of this area (Horse Heaven Hills) is resulting in habitat degradation and uncontrolled wildfire. Comment included many questions:**

Will the fire breaks be maintained annually, or will they just allow for the colonization of more cheatgrass? Where are the fire breaks going to be located?
Have you considered weed control and replanting with native bunch grass?
Lots of non-native flammable plant species are currently growing along McBee Rd. Are you going to control them?
What is being done to reduce illegal use by off road vehicles?
Hang gliders are driving up the hill to pick up their equipment which may also spark fire. Can you educate the recreational users of this area?
Are you going to increase off road vehicle enforcement patrols in this area?

All of these questions were addressed by Paul Ratcliff via phone conversations and an in-person meeting with the commenter on November 2nd, 2023

B. Fire Behavior Modelling Used

The specific fire behavior modelling inputs can be seen in Tables 11 & 12. These inputs were calculated by using a combination of tables found in the PMS 410-2 Fireline Handbook Appendix B, and weather readings from two representative Remote Automatic Weather Stations (RAWS) (NWCG 2006). The two RAWS stations that were selected were NWS 351316 Umatilla NWR and NWS 453201 Juniper Dunes. The specific weather readings were from June 13th, 2023, at 1500 hours, the approximate start time of the Hansen Road fire that burned just under 6300 acres in the project area. Other than the recorded maximum wind speed of 34 mph at the Juniper Dunes RAWS at that hour, these weather inputs are well below the local extremes of the project area. During the months of July and August, temperatures range in the mid-90s to over 100° F and relative humidities are often recorded in the teens or single digits. These hotter and drier conditions would equate to lower fuel moistures resulting in greater rates of spread and increased flame lengths, but the overall fire behavior trends for each fuel model would be similar.

Table 11. Pretreatment fire behavior calculations

Fuel Model	1-Hour Fuel Moisture	10-Hour Fuel Moisture	Herbaceous Live Fuel Moisture	Woody Live Fuel Moisture	Mid-flame Wind Speed	Slope	Temperature (F)	Relative Humidity
GR 2	4%	-	75%	-	0-30 mph	30%	90	27%
GR 4	4%	-	75%	-	0-30 mph	30%	90	27%
GS 2	4%	5%*	75%	120%*	0-30 mph	30%	90	27%

Inputs including fuel model, fuel moistures, slope, and weather conditions.
* 10-hour fuel moisture and woody live fuel moisture inputs are only applicable to the GS 2 fuel model.

Table 12. Proposed action fire behavior calculations

Fuel Model	1-Hour Fuel Moisture	10-Hour Fuel Moisture	Herbaceous Live Fuel Moisture	Woody Live Fuel Moisture	Mid-flame Wind Speed	Slope	Temperature (F)	Relative Humidity
GR 1	4%	-	75%	-	0-30 mph	30%	90	27%
GS 1	4%	5%*	75%	120%*	0-30 mph	30%	90	27%

Inputs including fuel model, fuel moistures, slope, and weather conditions.
* 10-hour fuel moisture and woody live fuel moisture inputs are only applicable to the GS 1 fuel model.

The final input that is needed to calculate fire behavior is the applicable fuel model. The primary set of fuel models used today are the 40 standardized fuel models based on fire behavior and effects modeling. This set is more refined that the original 13 and a more site-specific fuel model can be selected enabling more accurate outputs. The most important part in selecting a fuel model for fire behavior calculations is selecting a fuel model that is the primary carrier of fire spread (Scott and Burgan 2005, Andrews et al. 2003). Three fuel models were selected to represent the pretreatment conditions currently found, or expected to be found within the proposed fuel breaks since some fuel breaks or portions of fuel breaks were burned due to multiple wildfires within the project area. These fuel models are: GR2, Low Load, Dry Climate Grass, and GR4, Moderate Load, Dry Climate Grass, for much of the project area, and GS2, Moderate Load, Dry Climate Grass-Shrub for areas

where sage brush is found like Badger Canyon and parts of the McNary area. Two fuel models were selected that represent the results of the proposed actions. These fuel models are: GR1, Short, Sparse Dry Climate Grass, and GS1, Low Load, Dry Climate Grass-Shrub. A third fuel model is applicable but would provide no fire behavior; NB9, bare ground. This would be representative of a fuel break that was recently burned with areas that have little to no fuel available to contribute to fire spread. Table 13 provides the fuel loading, t/ac, and a brief description each fuel model. The description is a generalization of a representative fuel model. An area of dense grasses or continuous cheat grass may only be 12 inches tall, but the fine fuel loading may accumulate to the 2.15 t/ac of a GR4 fuel model.

Table 13. Fine fuel loading and description of applicable fuel models

Fuel Model	Condition	Fine Fuel Loading t/ac	Description
GR 2	Pretreatment	1.10	The primary carrier of fire in GR2 is grass, though small amounts of fine dead fuel may be present. Load is greater than GR1, and fuel bed may be more continuous. Shrubs, if present, do not affect fire behavior.
GR 4	Pretreatment	2.15	The primary carrier of fire in GR4 is continuous, dry-climate grass. Load and depth are greater than GR2; fuel bed depth is about 2 feet
GS 2	Pretreatment	2.10	The primary carrier of fire in GS2 is grass and shrubs combined. Shrubs are 1 to 3 feet high; grass load is moderate.
GR 1	Proposed Action	0.40	The primary carrier of fire in GR1 is sparse grass, though small amounts of fine dead fuel may be present. The grass in GR1 is generally short, either naturally or by grazing, and may be sparse or discontinuous.
GS 2	Proposed Action	1.35	The primary carrier of fire in GS1 is grass and shrubs combined. Shrubs are about 1 foot high; grass load is low.

Fuel models included in this table are representative of what is expected to be observed prior to treatment and after treatment under the proposed action.

Outputs from these fire behavior calculations, rate of spread and flame length in particular, can help firefighting personnel determine what tactics and strategies would be appropriate when suppressing a fire. The surface fire behavior chart, Figure 6, is a graph that illustrates primary fire behavior values—spread rate and intensity. The location of a plotted point represents the character of a fire, which can range from a fast spreading, low intensity fire to a slow spreading, high intensity fire. The chart is a visual aid for displaying both observed fire behavior and values calculated by computer programs such as the BehavePlus fire modeling system. Table 14 is a chart to interpret how these variables correlate to the tactical decision-making process for fire personnel. The surface fire characteristics chart includes curves for several flame length values as related to rate of spread and heat per unit area with symbols for fire suppression interpretations ranging from fires that can be attacked by persons with hand tools to fires for which control efforts are ineffective. Mathematical relationships among rate of spread, heat per unit area, fire line intensity, and flame length are the basis for the surface fire behavior characteristics chart (Andrews 2011). Two important thresholds have been established from this data. Fires with flame lengths under four feet can generally be attacked by ground personnel. When flame lengths are between four and eight feet, fires can generally be attacked by heavy equipment, engines, and aircraft, but flames of these lengths are too intense for personnel at the head of the fire. Any flame lengths above eight feet, lead to additional control problems as they increase in length. Flame lengths are more practical to estimate when suppressing fires compared to intensity, so this measure is more applicable to firefighters than fire intensity.

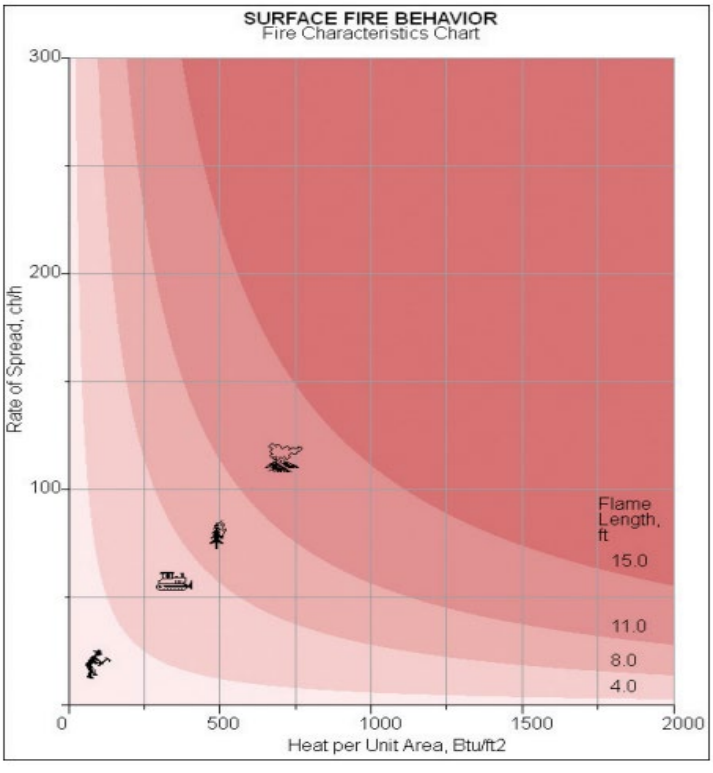

Figure 6. Surface Fire Behavior Chart (Andrews and Rothermel 1981). A curved matrix with three variables; rate of spread (chains per hour), heat per unit area (British Thermal Unit (Btu) per square foot), and flame length (feet).

Table 14. Relationship of surface fore flame length and fire line intensity to suppression interpretations

Flame Length (ft)	Fire Line Intensity (Btu/ft/s)	Interpretation
<4	<100	Fires can generally be attacked at the head or flanks by persons using hand tools. Hand line should hold the fire.
4-8	100-500	Fires are too intense for direct attack on the head by persons using hand tools. Hand line cannot be relied on to hold the fire. Equipment such as dozers, pumpers, and retardant aircraft can be effective.
8-11	500-100	Fires may present serious control problems-torching out, crowning, and spotting. Control efforts at the fire head will probably be ineffective.
>8	>1000	Crowning, spotting, and major fire runs probable. Control efforts at head of fire are ineffective.

(Andrews and Rothermel 1981).

C. Handline Comparison Table

Table 15. Handline Comparison Table

Fuel Break	BLM Acres	Non-BLM Acres	Total Acres	BLM Handline ft	Non-BLM Handline ft	Total Handline ft	BLM Existing Features ft	Non-BLM Existing Features ft	Total Existing Features ft	Total Containment line ft	% New
Gibbon	115	0	115	7811	0	7811	3777	0	3777	11588	67
Yakitat	161	1	162	5344	0	5344	4819	248	5067	10411	51
Benton Exit	68	0	68	5737	0	5737	1915	0	1915	7652	75
McBee	166	4	170	3793	9	3793	9304	2026	11330	15123	25
Webber	130	11	141	0	0	0	10453	2500	12953	12953	0
Badger	69	0	69	6866	0	6866	3041	0	3041	9907	69
McNary West	281	72	353	7802	0	7802	4809	6506	11315	19117	41
McNary East	155	56	211	3134	1001	4135	4809	5352	10161	14296	29
Total	1155	144	1289	40487	1001	41488	42927	16632	59559	101047	41

Acreage of each fuel break and total acreage of the project, including BLM and non-BLM lands. Total linear feet of handline to be constructed, existing features utilized, and total linear feet of all containment lines, as well as percentages of new handline versus existing features utilized for each fuel break and project.

D. Project Design Features

The BLM would follow established agency management plans, policies, and procedures, including the Best Management Practices (BMP) identified in the 1987 RMP and other applicable NEPA documents listed in section 1.5. We would also implement the following design features to avoid or minimize potential impacts to resources:

General

- Fuel breaks would utilize existing features (roads, trails, previous disturbance) as much as possible to minimize the amount of control line that must be constructed and minimize visual impacts to the project area.
- Resting of areas that are seeded from livestock grazing may occur.

Project design features taken from the Fuel Breaks EIS:

- Where feasible, fuel breaks would be constructed where vegetation disturbance by wildland fire or surface-disturbing activities has already occurred.
- Fuel breaks would be constructed in locations determined through interdisciplinary dialogue (including consultation and coordination with adjacent landowners), to best meet the goals of the local fire management plan and can be effectively monitored and maintained. They would be placed in a way that is strategically appropriate for fire suppression, while minimizing short- and long-term impacts on other resources.
- For safety and to protect site resources, treatment methods involving equipment generally would not be applied on slopes exceeding 35 percent.
- Prescribed fire operations would be conducted by qualified personnel when prescription parameters as defined in the burn plans are met.
- During treatment design and implementation, for all visual resource classes, use careful location (e.g., use topography for project screening), minimal disturbance, and consideration of visual contrasts with the surrounding landscapes. For example, drill seed vegetation in a serpentine pattern or modify drilling, for example by using minimum-or-no-till drills, slick discs, and drag chain, so that drill rows are not apparent.

Air Quality

- Conduct prescribed burning in accordance with the smoke permit procedures set forth by the Benton Clean Air Agency (BCAA) to minimize air quality impacts from smoke on local communities and individuals. Ensure atmospheric conditions are within prescriptions when a prescribed burn is ignited and monitor smoke throughout the fire.

Project design feature taken from Fuel Breaks EIS:

- Through site-specific smoke analysis, the BLM would comply with their respective state department of environmental quality or other state air monitoring group to ensure that smoke emissions from treatments remain below the National Ambient Air Quality Standard for PM2.5. The BLM would identify smoke-sensitive receptors at the site-specific project level.

Cultural Resources

- Acting as the lead agency for NEPA and Section 106 obligations, conduct consultations on a case-by-case basis with WA DAHP, private and public landowners, and appropriate tribes in an effort to identify cultural resources. Consultations include efforts to identify plant, fish, and game harvesting areas,

cultural resources sites, and traditional cultural properties (TCPs), and avoid adverse effects to the quality of, or limitations to the use of these resources as a result of project activity.

- Conduct Class III Cultural Resources inventories prior to any treatment activities with the potential to adversely affect cultural resources. If cultural resources are discovered in treatment areas that would be adversely affected by the undertaking, project design features would be implemented to avoid adverse effects. Project design features would be developed with all consulting parties and may include avoidance of the potentially affected resource.
- An Inadvertent (43 CFR 10.4) and Post Review Discovery (36 CFR 800.13) Plan (IPRDP) shall be followed by the BLM, its contractors, and/or anyone implementing actions authorized within this EA in order to further avoid and minimize any potential for adverse impacts to cultural resources and/or human remains and materials of cultural patrimony under the NHPA and NAGPRA. The BLM project lead for these actions will be responsible for disseminating the IPRDP, as authored by the BLM project archaeologist, to any parties responsible for implementation of undertakings within the proposed project area on private and public lands.
- No herbicide treatments shall occur within 1/10th mile of known pictograph or petroglyph sites, or in areas where chemicals may interact with known near-surface deposits that could be utilized for carbon dating. Areas with a high probability to contain unrecorded cultural sites of such types would be surveyed to Class III standards by an SOI-qualified archaeologist prior to project implementation.
- Construction and control methods utilizing machinery and wheeled vehicles would not come to within 1 meter of any stacked rock feature (fences, cairns, corner markers, etc.) in order to avoid accidental damage and/or toppling.
- Signs would be posted in all herbicide treatment areas and water-soluble dyes would be added to applications to minimize accidental ingestion and exposure for traditional use practitioners.

Paleontological Resources

- Apply Minimum Impact Suppression Tactics (MIST) in fire-treated areas where the potential to impact important paleontological resources exists.

Public Safety

- Produce an agency-reviewed burn plan to ensure achievement of resource benefits while mitigating or eliminating the risk of negative outcomes. All prescribed fire operations would be carried out by qualified personnel only.
- Establish a buffer between treatment areas and human residences based a minimum buffer of ¼ mile for aerial applications and 100 feet for ground applications, unless a written waiver is granted.

Project design features taken from Fuel Breaks EIS:

- Signs would be installed in treatment areas during activities for public safety.
- Signs would be posted on primary roads accessing the area being burned to alert drivers of the potential for reduced visibility due to smoke.
- If smoke threatens unacceptable impacts on transportation safety or communities, ignition should cease, provided control of the burn is not compromised.

Wildlife

- Conduct appropriately timed surveys within suitable or potential habitats for BLM special status species prior to treatment implementation.

- Implementation activities, including contracts, would be modified, or cancelled if protective measures proved inadequate, new species were discovered within treatment units, or a new species is listed that could be affected.
- In the Badger Canyon fuel break, the prescribed fire burn plan would emphasize the use of firing patterns that produce backing and flanking fire to reduce fire effects to sagebrush within the fuel break.
- Avoid use of prescribed fire in occupied habitat when ground squirrels are surface-active (January 15 – June 30).
    - Known sites in the Horse Heaven Hills and Badger Canyon.
- Do not use 2,4-D in occupied habitat when ground squirrels are surface-active (January 15 – June 30). Avoid broadcast treatments of diquat, diuron, glyphosate, hexazinone, picloram, tebuthiuron, and triclopyr in occupied habitat when ground squirrels are surface-active. Do not use the maximum rates for 2,4-D, diquat, and diuron for spot treatments in occupied ground squirrel habitat (at any time of year).
- Do not use prescribed fire during the migratory bird nesting season (May 15 to July 15).
- Do not use 2,4-D during the migratory bird nesting season (May 15 to July 15), when practicable. Avoid broadcast applications of diquat, diuron, glyphosate, hexazinone and triclopyr during the migratory bird nesting season, when practicable. Do not use the maximum rates for diquat, diuron, glyphosate, hexazinone, and triclopyr for spot treatments during the migratory bird nesting season, when practicable.
- Do not allow noise and activity disturbance (vehicular traffic, tractors, or pump equipment) within 0.25 miles of known raptor nest sites during their breeding seasons. Activities along existing open roads are not restricted due to habituation to disturbance in these situations. Raptor breeding seasons are ferruginous hawk (March 1 - May 31), burrowing owl (February 15 – September 25), short-eared owl (March 15 – August 31).
    - Ferruginous Hawk: Known sites in Horse Heaven Hills and Badger Canyon.
- Do not allow helicopter/aircraft activity within 1 mile of known raptor nest sites during their breeding seasons (2 miles for ferruginous hawks). (March 1 - May 31).
- Conduct prescribed fire activities in a manner that ensures that known raptor nest sites are greater than 1 mile (2 miles for ferruginous hawks) from downwind smoke effects.

Rare and Special Status Plants

- Prescribed fire burn plan would emphasize the use of firing patterns that produce backing and flanking fire around known rare plant sites to reduce fire intensity at these sites.
- Chemical treatments in proximity to Sensitive plant occurrences would be buffered to protect plants from drift of broadcast spray.
- The following buffers are for individual BLM Sensitive plants when herbicides or prescribed fire are used. Buffers will be accomplished though non-ground disturbing methods such as the use of weed eaters and pre-wetting to keep rare plant sites from burning. Firing patterns would also be modified around rare plant buffers to prevent fire from entering the sites.
    - **Woven**-spore lichen (*Texosporum santi-jacobi*): buffer size = 50 feet. Known site in Horse Heaven Hills.
    - Rare mosses (*Bryoerythrophyllum, Aloina, Tortula*): buffer size = 50 feet. Known sites in McNary/Sillusi Butte parcels.
- Manual and mechanical treatments may be used inside buffers if individual plants have been identified for protection.

- Herbicides that degrade quickly in the environment would be used in TES plant occurrence locations. The following herbicides, due to their potentially long half lives in soil, would not be used within 200 feet of TES plants: aminopyralid, clopyralid, tebuthiuron, imazapic, and diquat.
- Spot treatments with herbicides using protective barriers, such as buckets or panels to block herbicide spray from around individual plants could occur on case-by-case bases if individual plants have been identified for protection and it has been determined that the invasive plants are threatening the T&E and/or Sensitive (TES) plant occurrence. These treatment methods and appropriate mitigation measures would be supervised by qualified BLM personnel prior to manual, herbicide, and/or biological agent treatments in occupied TES plant habitat. Otherwise, distances above would be used.
- The BLM will monitor the rare plant occurrences during and after the project is completed. The BLM would monitor site populations and habitat for up to five years, post-project.

Project design feature taken from Fuel Breaks EIS:

- If special status plant or animal populations and their habitats occur in a proposed treatment area, assess the area for habitat quality and base the need for treatment on special status species present. Conduct appropriately timed surveys within suitable or potential habitats for federally listed, proposed, and BLM special status species prior to treatment.

Invasive, Non-native Vegetation

Project design feature taken from Fuel Breaks EIS:

- Noxious weeds and invasive plants would be monitored to track changes in populations over time, and corrective action would be prescribed where needed, in accordance with local weed programs. Thresholds and responses for noxious weeds and invasive plants (particularly invasive annual grasses) will be included in fuel break implementation and monitoring plans.
- All prescribed soil disturbance would need to incorporate noxious and invasive weed management, including pre-work evaluation or avoidance.

Project design features taken from the Spokane NIMP EA:

Prevention Measures

- Locate and use weed-free project staging areas. Avoid or minimize all types of travel through weed-infested areas or restrict travel to periods when the spread of seeds or propagules is least likely.
- Prevent weed establishment by not driving through weed-infested areas.
- Inspect and document weed establishment at access roads, cleaning sites, and all disturbed areas; control infestations to prevent weed spread within the project area.
- Identify sites where equipment can be cleaned. Clean equipment before entering public lands.
- Clean all equipment before leaving the project site if operating in areas infested with weeds.
- Inspect and treat weeds that establish at equipment cleaning sites.
    - Pre-treat high-risk sites for weed establishment and spread before implementing projects.
    - Inspect and document all limited term ground-disturbing operations in noxious weed infested areas for at least 3 growing seasons following completion of the project.
    - Evaluate options, including closure, to regulate the flow of traffic on sites where desired vegetation needs to be established. Sites could include road and trail rights-of-way (ROW), and other areas of disturbed soils.

Revegetation

- To prevent conditions favoring weed establishment, reestablish vegetation on bare ground caused by project disturbance as soon as possible using either natural recovery or artificial techniques.

Herbicide Application

- Conduct a pretreatment survey before applying herbicides.
- Follow herbicide product label for use and storage.
- Apply the least amount of herbicide needed to achieve the desired result.
- Consider surrounding land use before assigning aerial spraying as a treatment method and avoid aerial spraying near agricultural or densely populated areas.
- Make helicopter applications at a target airspeed of 40 to 50 miles per hour (mph), and at about 30 to 45 feet above ground.
- Take precautions to minimize drift by not applying herbicides when winds exceed >10 mph (>6 mph for aerial applications), or a serious rainfall event is imminent.
- Select proper application equipment (e.g., spray equipment that produces 200- to 800-micron diameter droplets [spray droplets of 100 microns and less are most prone to drift]).

ESA-listed fishes and critical habitat

Design Features for herbicide use from the Spokane NIMP EA:

Buffers

- The Columbia is defined as a Category 1 (Fish-bearing) Riparian Habitat Conservation Area (RHCA). RHCAs are areas where riparian-dependent resources receive management emphasis.
- Category 1 RHCA buffer is 300 feet slope distance each side of the river.

Buffer (Appendix C-2a, C-4a) summary for Cat 1 RHCAs (e.g., the Columbia River)

- Aerial herbicide application would only occur > 0.5 mi. outside of the RHCA; i.e. > 0.5 mi. outside of the 300 foot buffer for the Columbia River.
- Within 0.5 mi. of the 300-foot buffer, all herbicide applications will be ground- based spot treatments of noxious weeds. Max 8 mph wind speed.
- Do not use in RHCA: “moderate risk” (Imazapyr, Sulfometuron-methyl, Chlorsulfuron) or “high risk” (Triclopyr-BEE, Picloram, Sethoxydim, 2,4-D (ester))
- The surfactants R-11, Polyethoxylated tallow amine (POEA), and herbicides that contain POEA (e.g., Roundup) will not be used within RHCA.
- No work within 15 feet of live waters for herbicides labeled for “Aquatic Use” and “low risk” (Table C-4a).

Aquatic/riparian-specific restrictions (focused on Critical Habitat)

- An herbicide safety/spill response plan is required for all projects to reduce the likelihood of spills, misapplication, reduce potential for unsafe practices, and to take remedial actions in the event of spills. Spill plan contents will follow agency direction.
- Herbicide carriers (solvents) are limited to water or specifically labeled vegetable oil.
- All hauling and application equipment shall be free from leaks and operating as intended.

- Avoid water withdrawals from the Columbia River or other fish bearing streams.
- Within the RHCA (within 300 feet of the Columbia River):
- Herbicide buffer distances (see Appendix C-4a summary) will be observed during herbicide applications.
- Do not use vehicle equipment off established roads.
- Do not fuel/refuel equipment, store fuel, or perform equipment maintenance.
- The surfactants R-11, Polyethoxylated tallow amine (POEA), and herbicides that contain POEA (e.g., Roundup) will not be used.
- Do not mix herbicides.
- Do not wash out spray tanks.
- Herbicides are restricted to BLM-approved formulations of the following active ingredients: 2, 4-D, aminopyralid, bromacil, chlorsulfuron, clopyralid, dicamba, diuron, fluroxypyr, glyphosate, hexazinone, imazapyr, metsulfuron methyl, picloram, rimsulfuron, sulfometuron methyl, tebuthiuron, triclopyr, imazapic, diquat, difluenzopyr (in formulation with dicamba), and fluridone.

Livestock Grazing

- Notify operators of current livestock authorizations of the treatment project to improve coordination and avoid potential conflicts and safety concerns to livestock during implementation of the fire or herbicide treatment activities.
- Whenever possible and whenever needed, schedule treatments when livestock are not present in the treatment area. Design treatments to take advantage of normal livestock grazing rest periods, when possible.
- As directed by the herbicide product label, remove livestock from treatment sites prior to herbicide application, where applicable.
- Use herbicides of low toxicity to livestock, where feasible.

Soil and Aquatic Resources

- Post and maintain signage where control lines meet public access points (i.e., roads and trails intersections). This signage would state that these lines are prescribed fire control lines and not recreational trails. If public use becomes an issue with these signs in place, portions of control lines may need to be returned to a natural state when not in use.
- Reseed all control lines where bare-mineral soil is present, other than roads and BLM designated trails, after prescribed fire operations are complete.
- Design Features for herbicide use from the Spokane NIMP EA:
    - Minimize disturbance to biological soil crusts (e.g., by timing treatments when crusts are moist).
    - Minimize treatments in areas where herbicide runoff is likely, such as steep slopes when heavy rainfall is expected.
    - Minimize use of herbicides that have high soil mobility, particularly in areas where soil properties increase the potential for mobility.
    - Do not apply granular herbicides on slopes of more than 15 percent where there is the possibility of runoff carrying the granules into non-target areas.

- To avoid the loss of finer-sized soil particles and avoid having herbicide-treated soils blown or washed offsite, avoid exposing large areas with soils having high wind erosion risk when a combination of dry soil and seasonal winds are expected.

- Fire can be allowed to progress into gullies and drainages, but no active lighting will occur in these areas to retain vegetation for soil stability.
- Construct certified weed-free straw wattles on firelines where practical and appropriate to minimize erosion, using the following guidelines:

Table 16. Erosion Control Guidelines

Fireline Percent Grade	Maximum Spacing in Feet
6-9	400
10-15	200
15-25	100
25+	50

The maximum spacing between straw wattles based on the percent grade of slopes to mitigate soil erosion.

Project design features taken from Fuel Breaks EIS:

- Avoid or minimize potential ground-disturbing activities when soils are saturated.
- Soils, site factors, and timing of application must be suitable for any ground-based equipment used for creating a fuel break. This is to avoid excessive compaction, rutting, or damage to the soil surface layer. Equipment would be used on the contour, where feasible.

E. Inadvertent (43 CFR 10.4) and Post Review Discovery (36 CFR 800.13) Plan (IPRDP)

Condition 1: Inadvertent Discoveries (43 CFR 10.4) - If human remains are encountered, the BLM Ranger, county coroner or medical examiner and local law enforcement are to be notified immediately. If burials, funerary items, sacred objects, or objects of cultural patrimony are encountered, the BLM archaeologist shall be notified immediately. All activity is to cease immediately in the location of the discovery. Protective measures are to be implemented until the discovery can be assessed by the authorized official. On federal land, and in the case of Native American remains, the BLM would implement internal procedures for consulting with Tribes and complying with NAGPRA.

Condition 2: Post-Review Discoveries (36 CFR 800.13) – In the event that prehistoric artifacts (i.e. arrowheads, spear points, mortars, pestles, other ground stone tools, knives, scrapers, or flakes from the manufacture of tools, fire pits, peeled trees, etc.) or historic period artifacts or features (i.e. cans, ceramics, glass bottles, dumps, cabins, root cellars, privies, etc.) are found at any point over the course of project activities (including pre and post implementation), the BLM will avoid the area and ensure that artifacts are not removed or damaged. As a general rule, buildings, structural remains, historic artifacts (cans, bottles etc.), stacked rock features (such as walls, alignments, and cairns, etc.) shall be avoided at all times by any kind of prescribed fire, hand tools, mechanized equipment or wheeled transportation during implementation. If an historic or cultural artifact or

feature is discovered, the BLM, and/or its contractors, shall inform the Lead Archaeologist as soon as possible and/or the Border Field Office Field Manager at 509-536-1200 immediately. No further activity shall be allowed within 10 meters of the find until a plan for managing or preserving the artifacts or features are approved and in place.

Condition 3: Activities that have the potential to disturb cultural resources outside of the specified and approved project boundary (APE) and actions (as originally proposed) shall not proceed prior to cultural resources review of potential effects in the new area under the new conditions. Future actions may be subject to review of the most current cultural resource records to ensure that no new sites or features have been discovered since the initial authorization of this undertaking which may be disturbed thorough it's continued implementation.

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G. Commonly Used Acronyms

AA Analysis Area
AML Appropriate Management Level
AUM Animal Unit Month
BCC Birds of Conservation Concern
BCR Bird Conservation Region
BHCA Bird Habitat Conservation Areas
BLM Bureau of Land Management
CA Cooperating Agency
CFR Code of Federal Regulations
DF Design Feature
EA Environmental Assessment
EPA Environmental Protection Agency
FLPMA Federal Land Policy and Management Act
GIS Geographic Information System
GPS Global Positioning System
H Handbook
HA Herd Area
HMA Herd Management Area
HMAP Herd Management Area Plan
HQ Headquarters (BLM)
IDT Interdisciplinary Team
IM Instruction Memorandum
M Manual
MBTA Migratory Bird Treaty Act
MLRA Major Land Resource Area
MOU Memorandum of Understanding
NAS National Academies of Sciences
NHPA National Historic Preservation Act
NRCS Natural Resource Conservation Service
OHV Off Highway Vehicle
ORP Off-Range Pasture
PGS Population Growth Suppression
PLPCO Public Land Policy Coordinating Office
PRIA Public Rangeland Improvement Act

PZP Porcine Zona Pellucida RFID Radio-Frequency Identification

RMP Resource Management Plan

ROD Record of Decision

TGA Taylor Grazing Act

TNEB Thriving Natural Ecological Balance

U.S.C. United States Code

USDA United States Department of Agriculture

USFWS United States Fish and Wildlife Service

VHF Very High Frequency

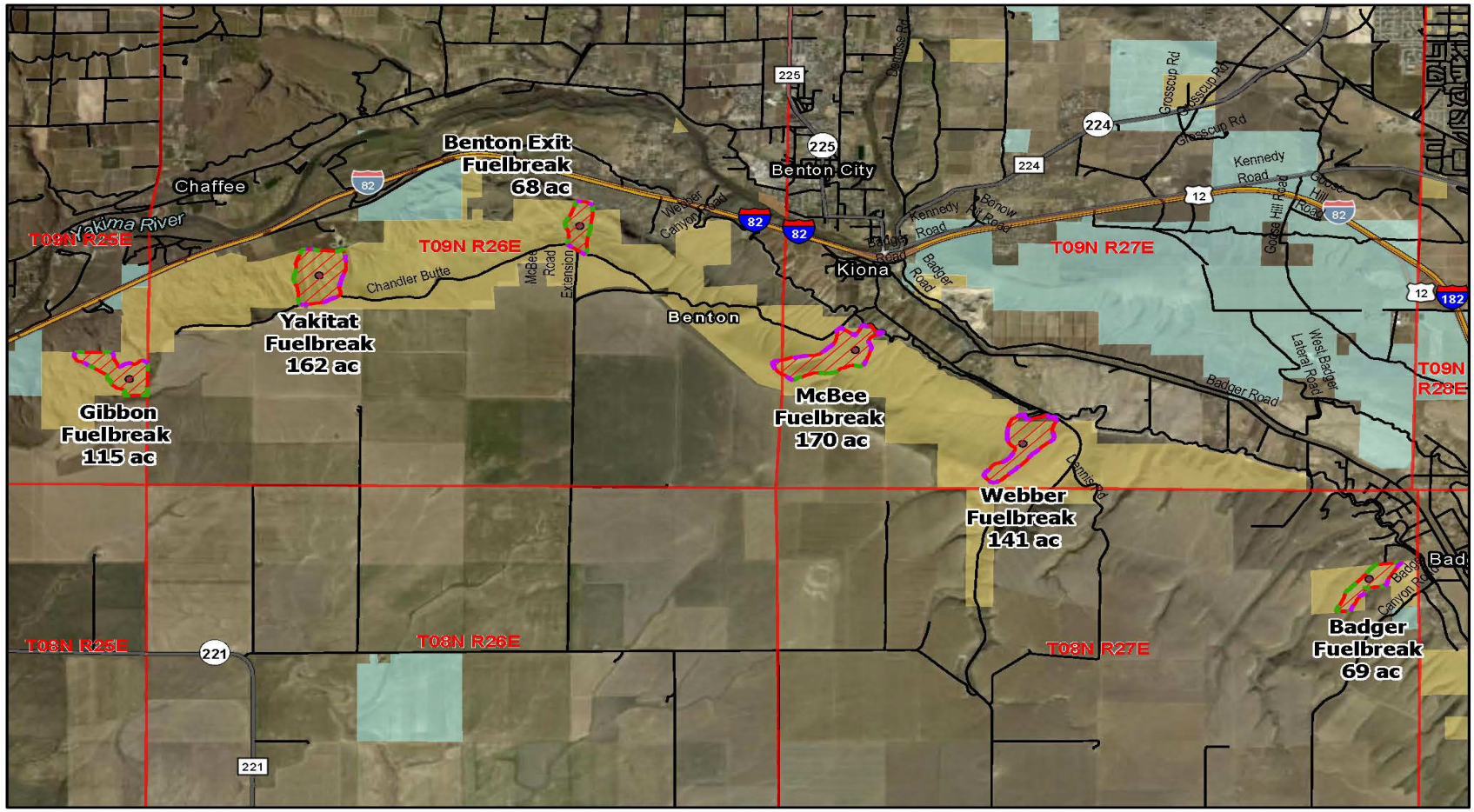
WO Washington Office (BLM)

WAOR Washington Oregon State Office (BLM)

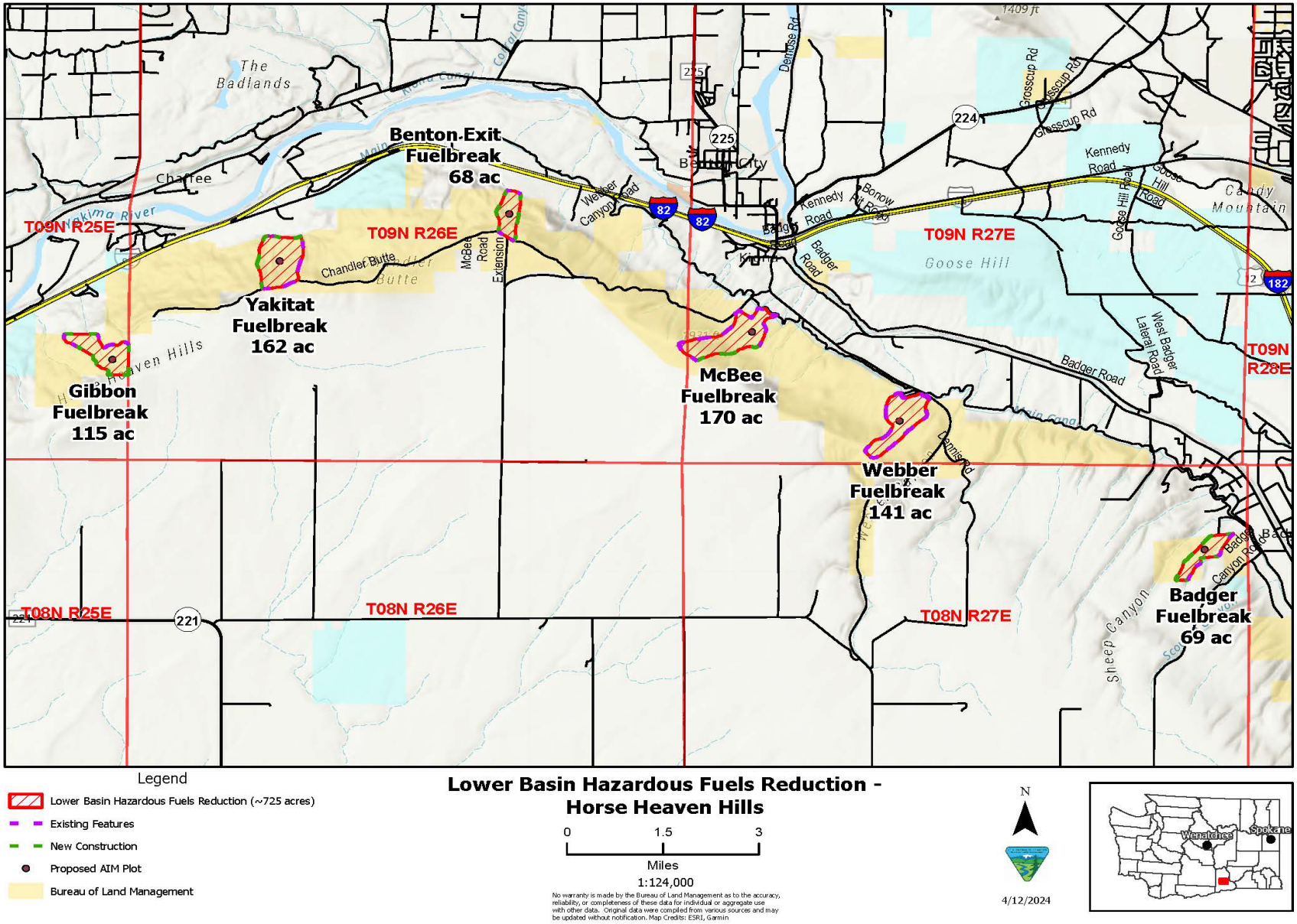
WSA Wilderness Study Area

H. Maps

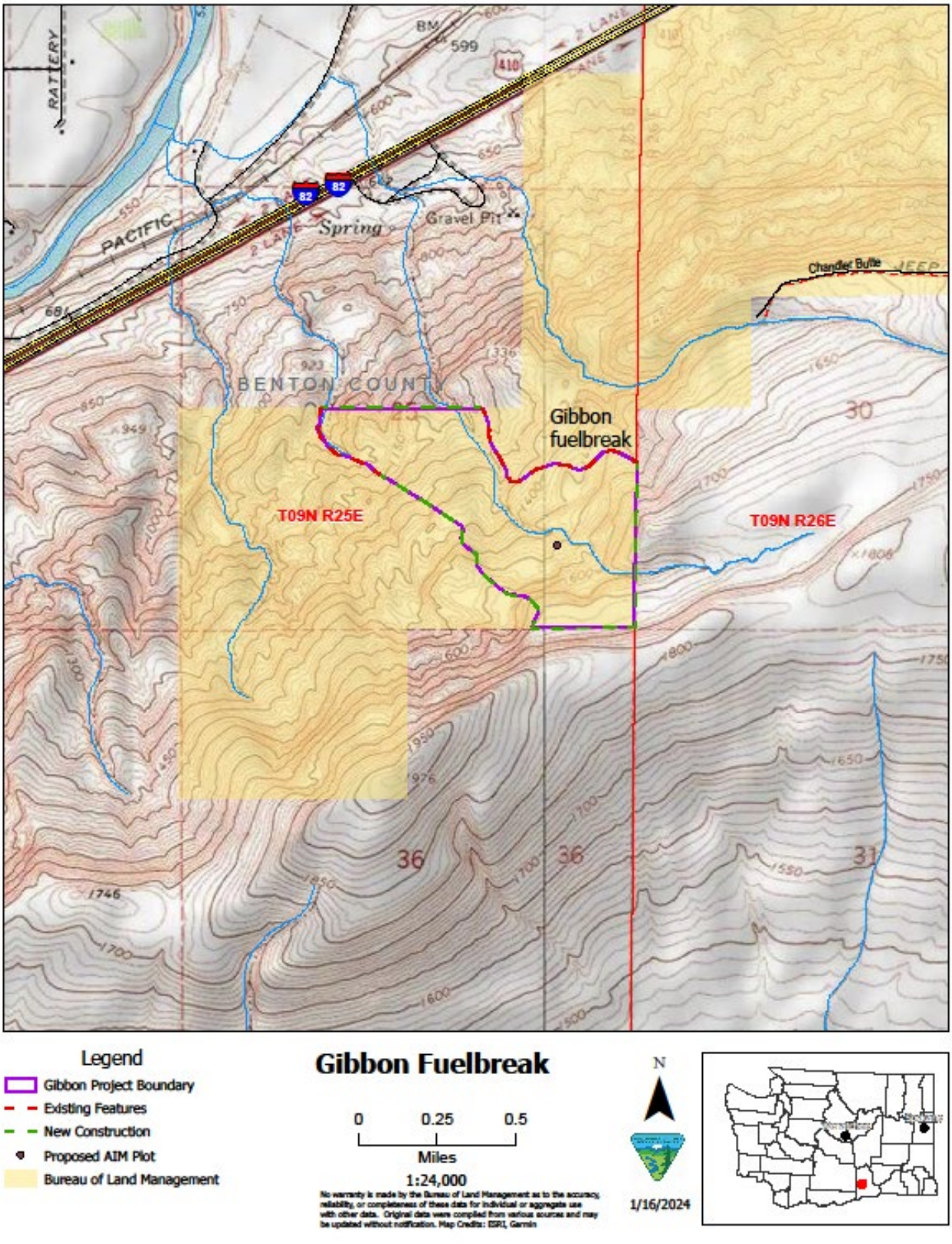
H.1: Horse Heaven Hills Aerial



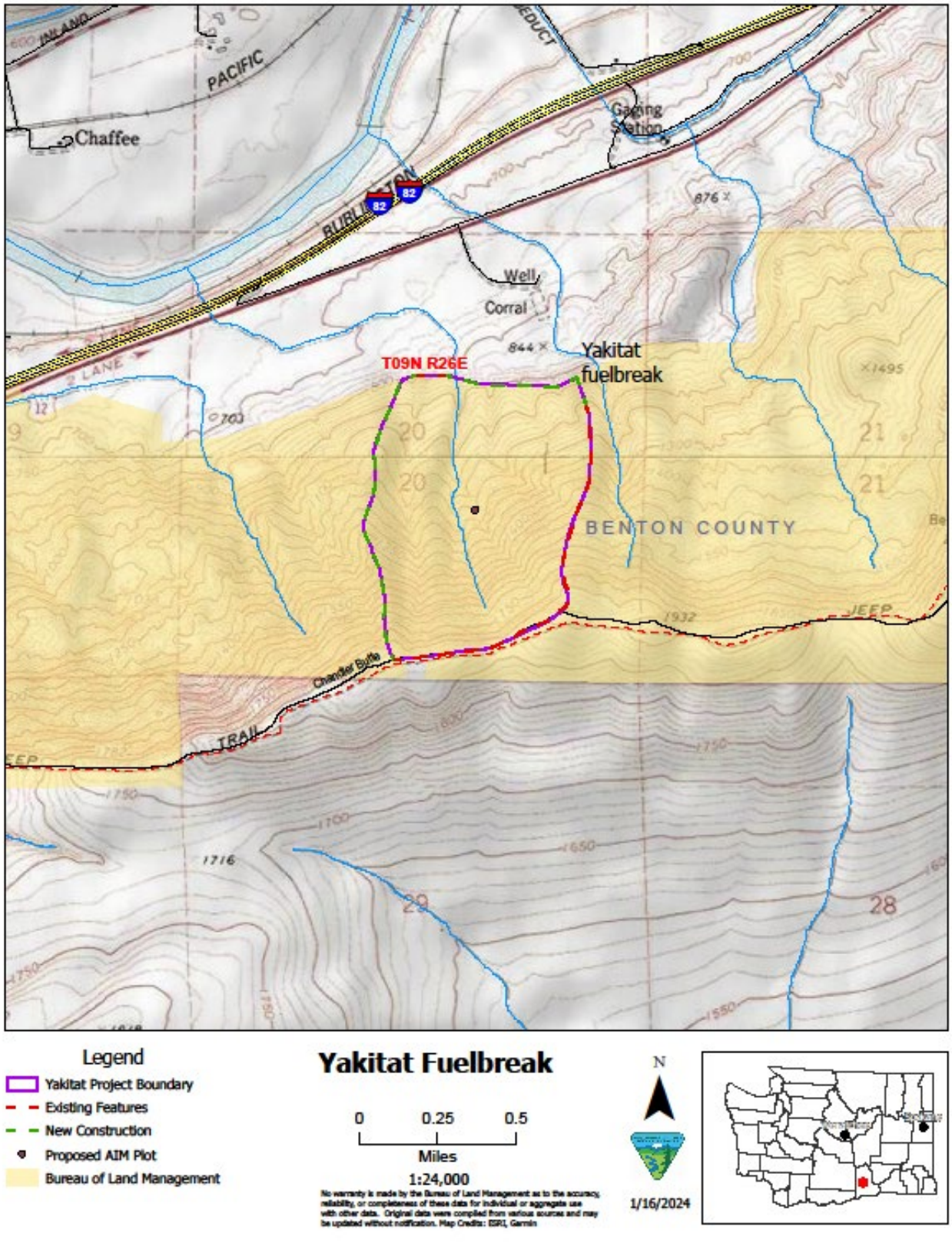
H.2: Horse Heaven Hills Topographical



H.3: Gibbon


Gibbon fuelbreak
T09N R25E
T09N R26E
BENTON COUNTY
PACIFIC
Spring
Gravel Pit
Chandler Butte
RATTERY
BM 599
410
82
2 LANE
36
30
31
Legend
Gibbon Project Boundary
Existing Features
New Construction
Proposed AIM Plot
Bureau of Land Management
Gibbon Fuelbreak
0 0.25 0.5
Miles
1:24,000
No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources and may be updated without notification. Map Credits: ESRI, Garmin
N
1/16/2024

H.4: Yakitat


PACIFIC
Chaffee
Gaging Station
82
Well
Corral
844
Yakitat fuelbreak
T09N R26E
BENTON COUNTY
JEEP
TRAIL
1716
20
21
28
29
Legend
Yakitat Project Boundary
Existing Features
New Construction
Proposed AIM Plot
Bureau of Land Management
Yakitat Fuelbreak
0
0.25
0.5
Miles
1:24,000
No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources and may be updated without notification. Map Credits: ESRI, Garmin
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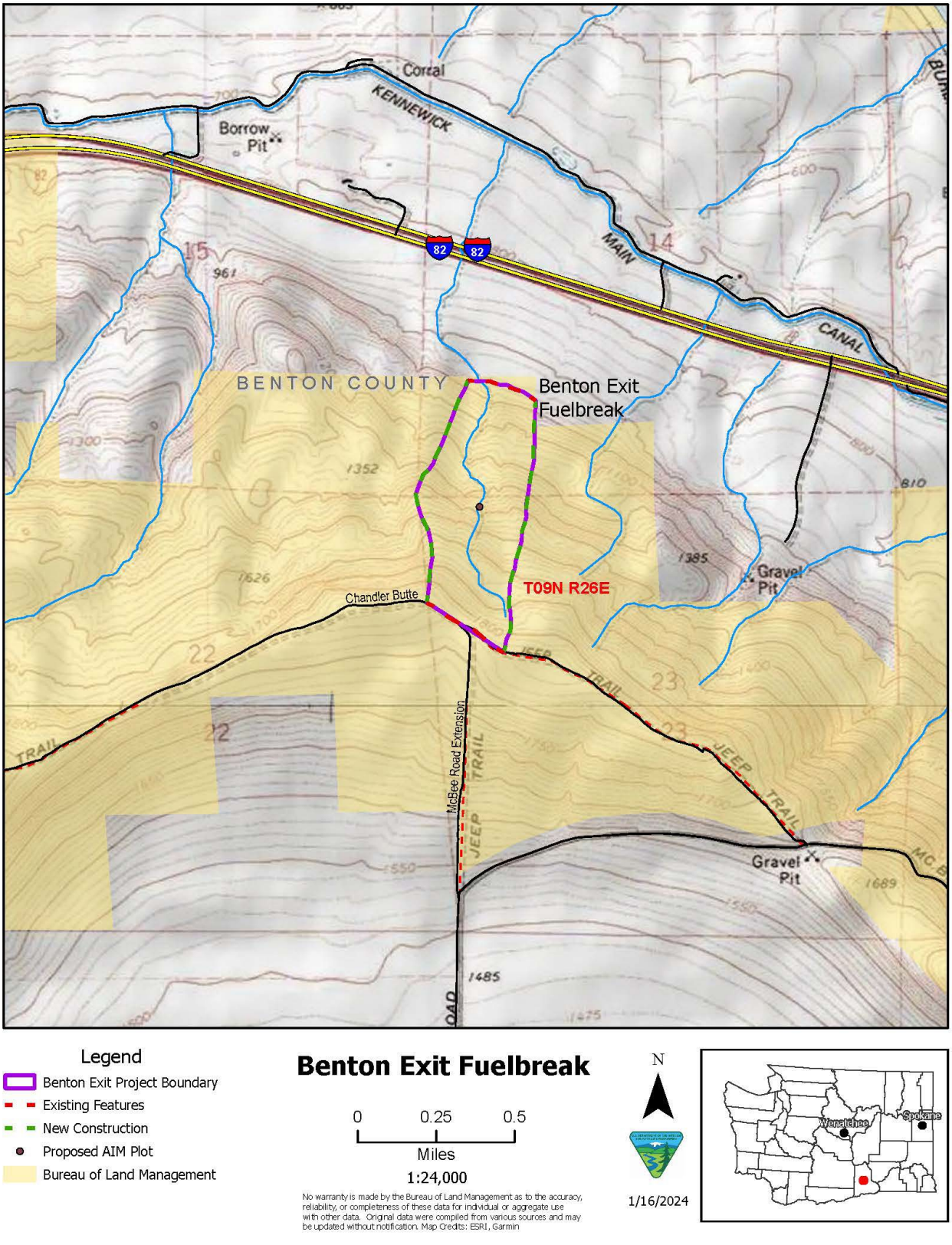
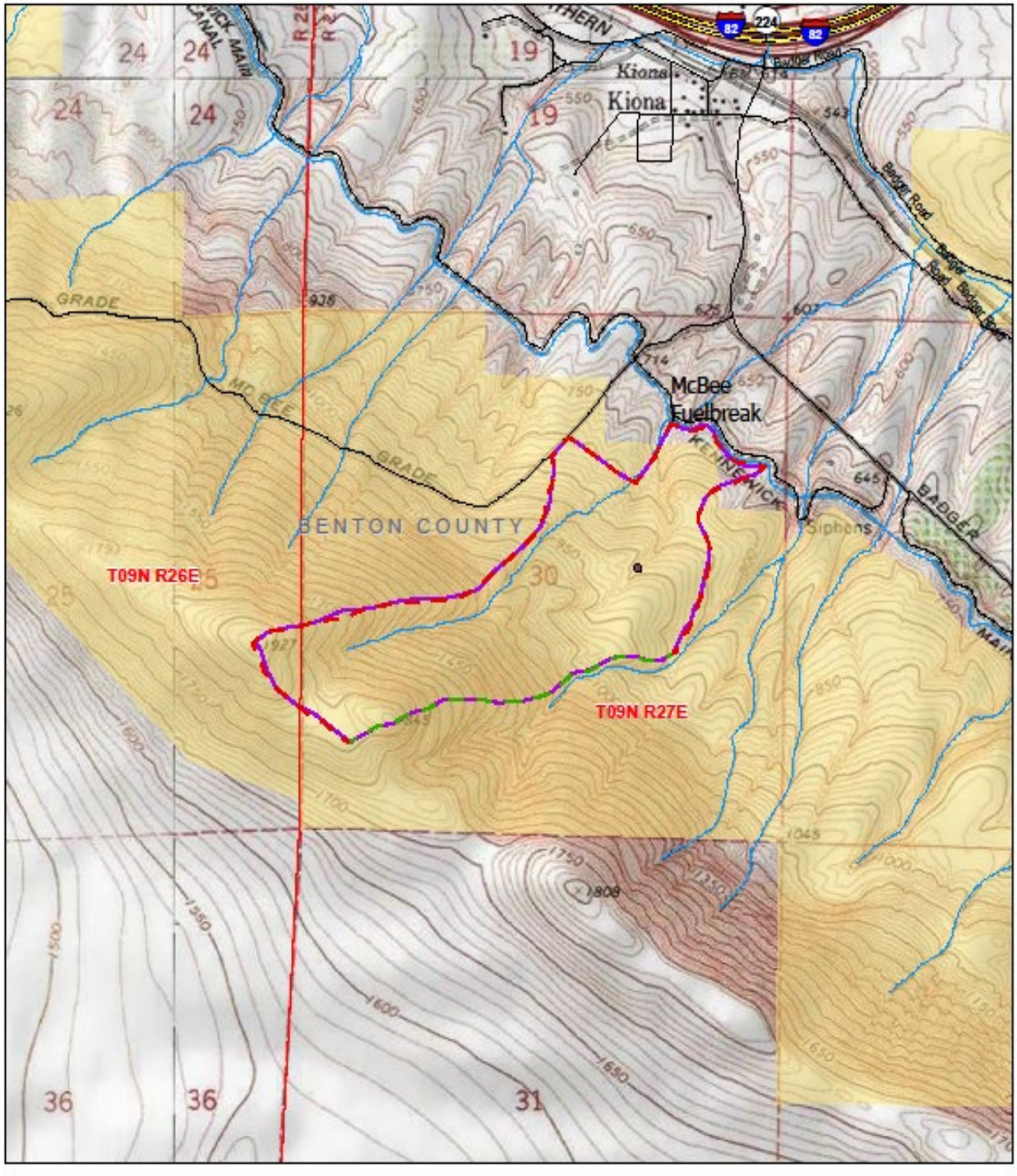
1/16/2024

H.5: Benton Exit



H.6 McBee



Legend

- McBee Project Boundary
- Existing Features
- New Construction
- Proposed AIM Plot
- Bureau of Land Management

McBee Fuelbreak

0 0.25 0.5

Miles

1:24,000

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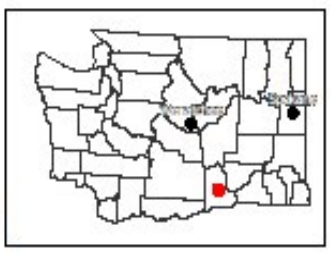
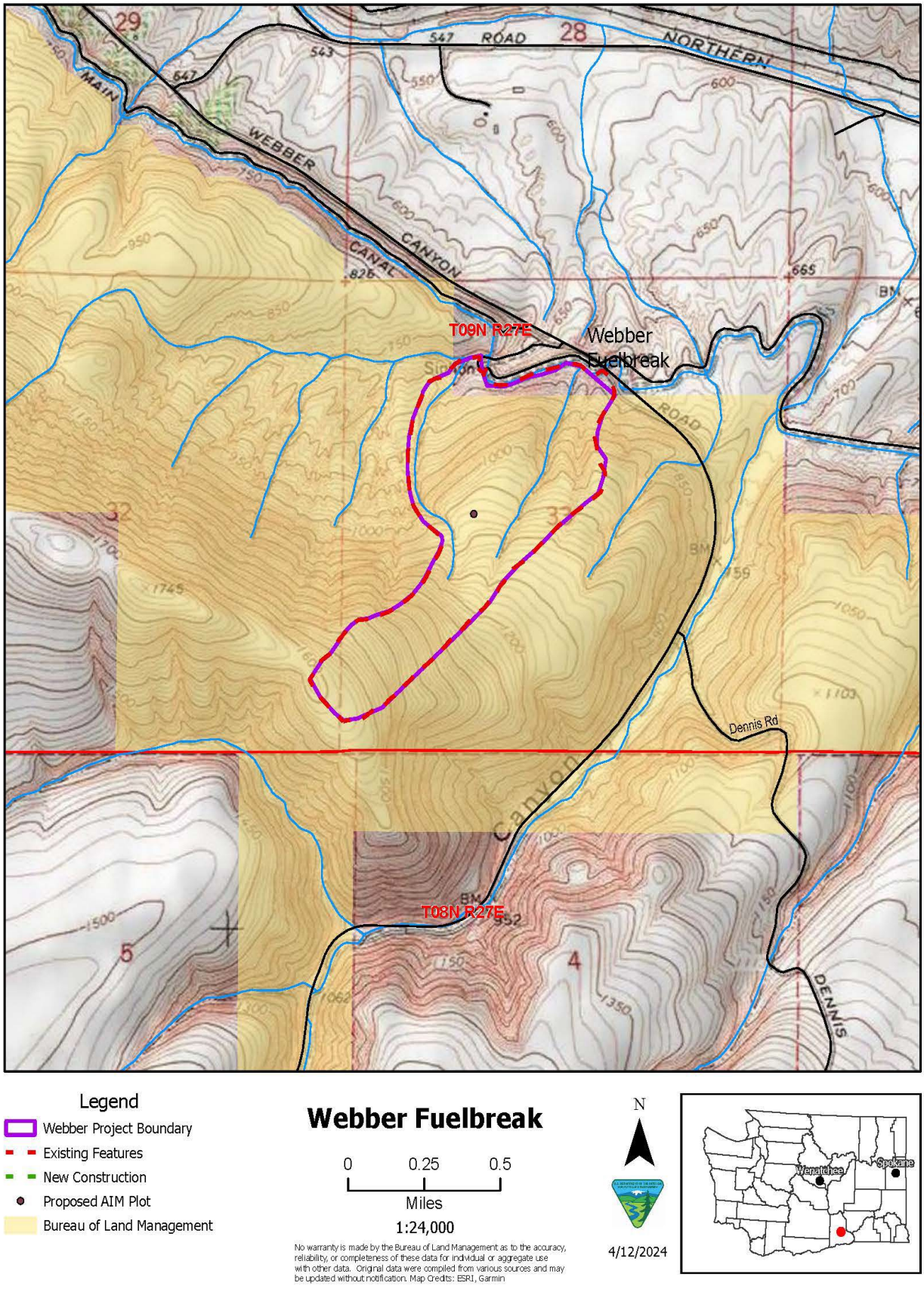
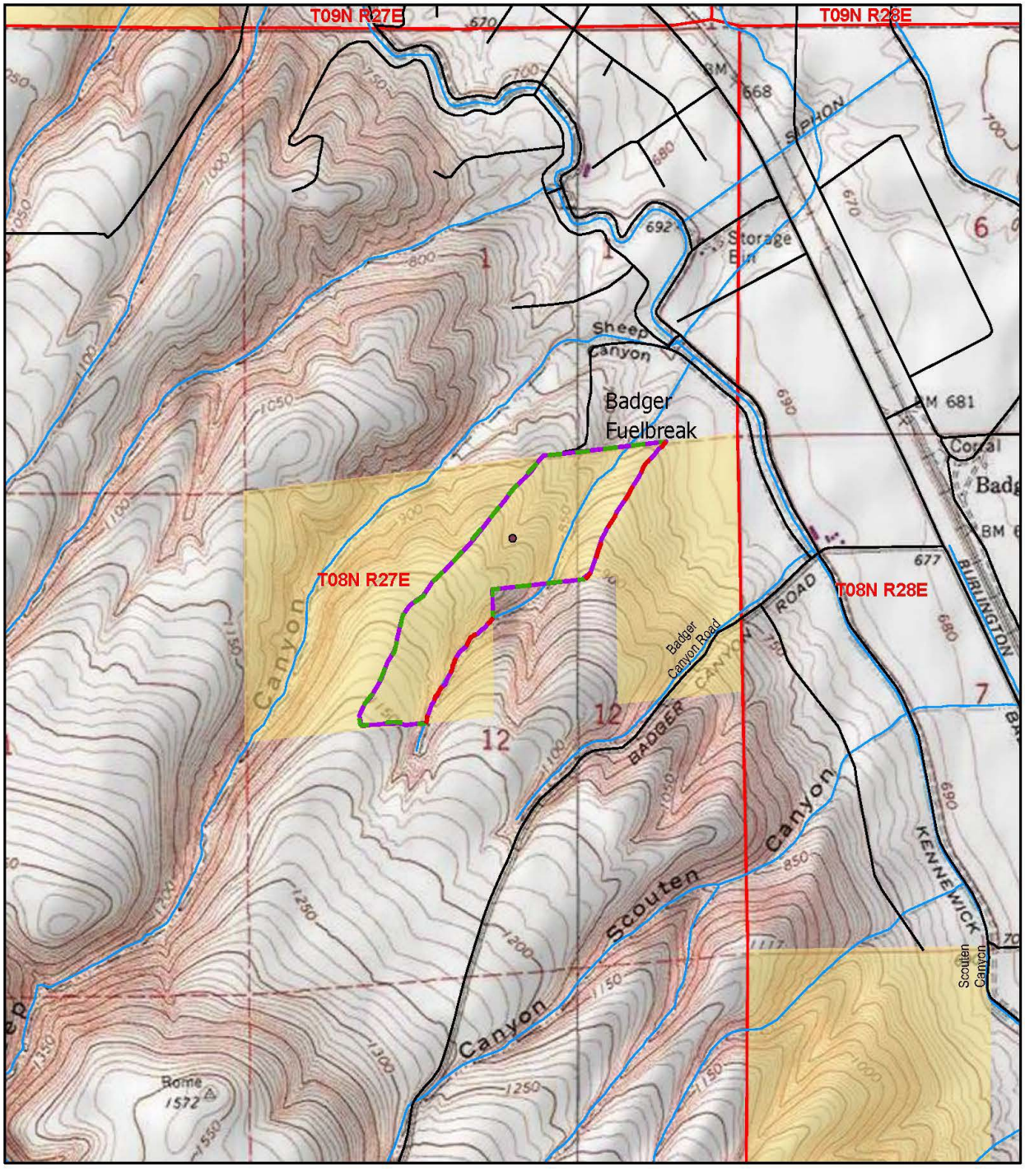
1/16/2024



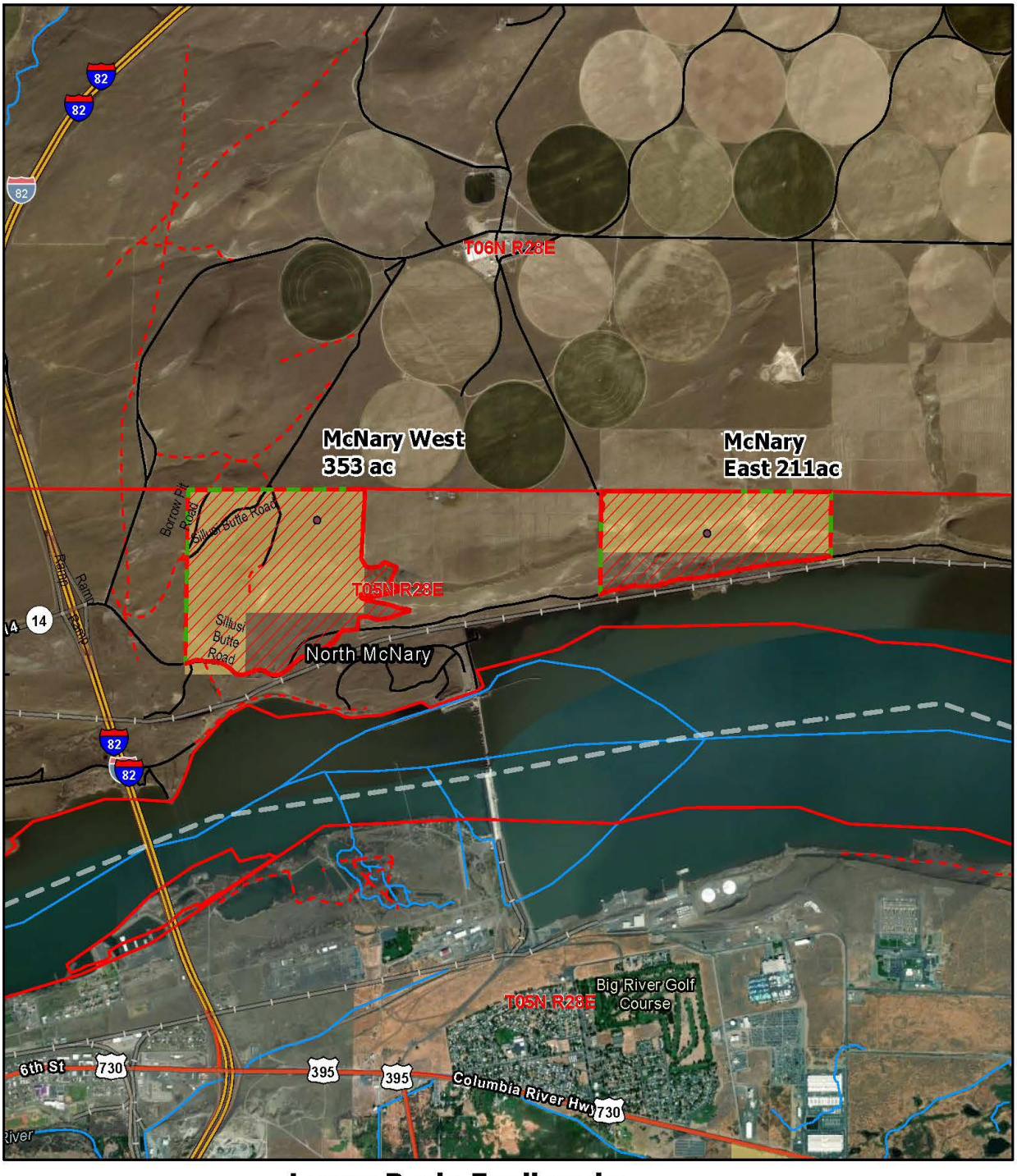
H.7: Webber


T09N R27E
Webber
Fuelbreak
T08N R27E
Dennis Rd
WEBBER CANYON CANAL
MAIN
547 ROAD
NORTHERN
DENNIS
Legend
Webber Project Boundary
Existing Features
New Construction
Proposed AIM Plot
Bureau of Land Management
Webber Fuelbreak
0 0.25 0.5
Miles
1:24,000
No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources and may be updated without notification. Map Credits: ESRI, Garmin
N
4/12/2024
Wenatchee
Spokane

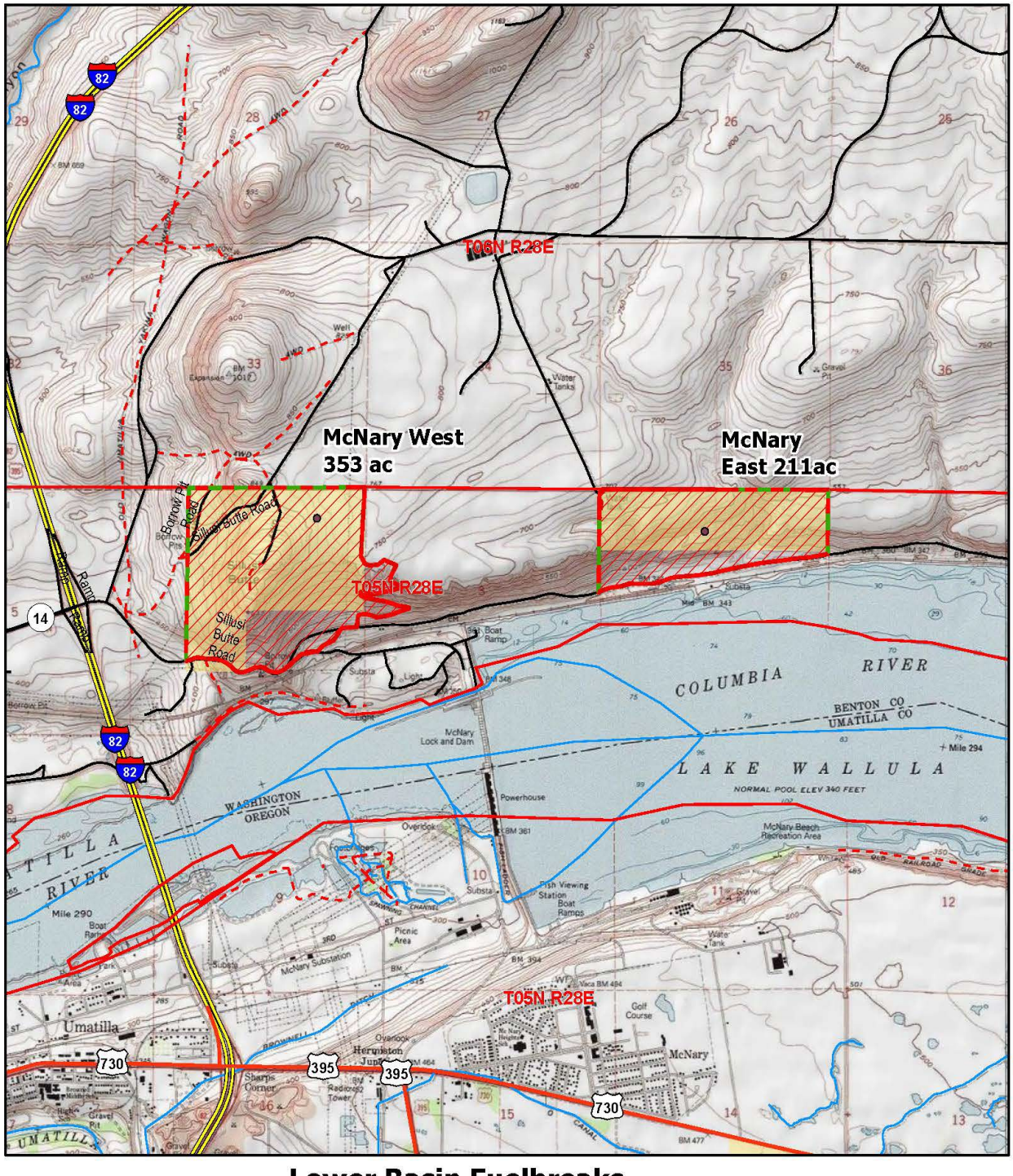
H.8: Badger


T09N R27E
T09N R28E
T08N R27E
T08N R28E
Badger Fuelbreak
Sheep Canyon
Badger Canyon Road
Badger Canyon
Scouten Canyon
Kennewick
Rome
1572
Storage Bin
Coral
Legend
Badger Project Boundary
Existing Features
New Construction
Proposed AIM Plot
Bureau of Land Management
Badger Fuelbreak
0 0.25 0.5
Miles
1:24,000
No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources and may be updated without notification. Map Credits: ESRI, Garmin
N
1/16/2024
Wenatchee
Spokane

H.9: McNary Aerial

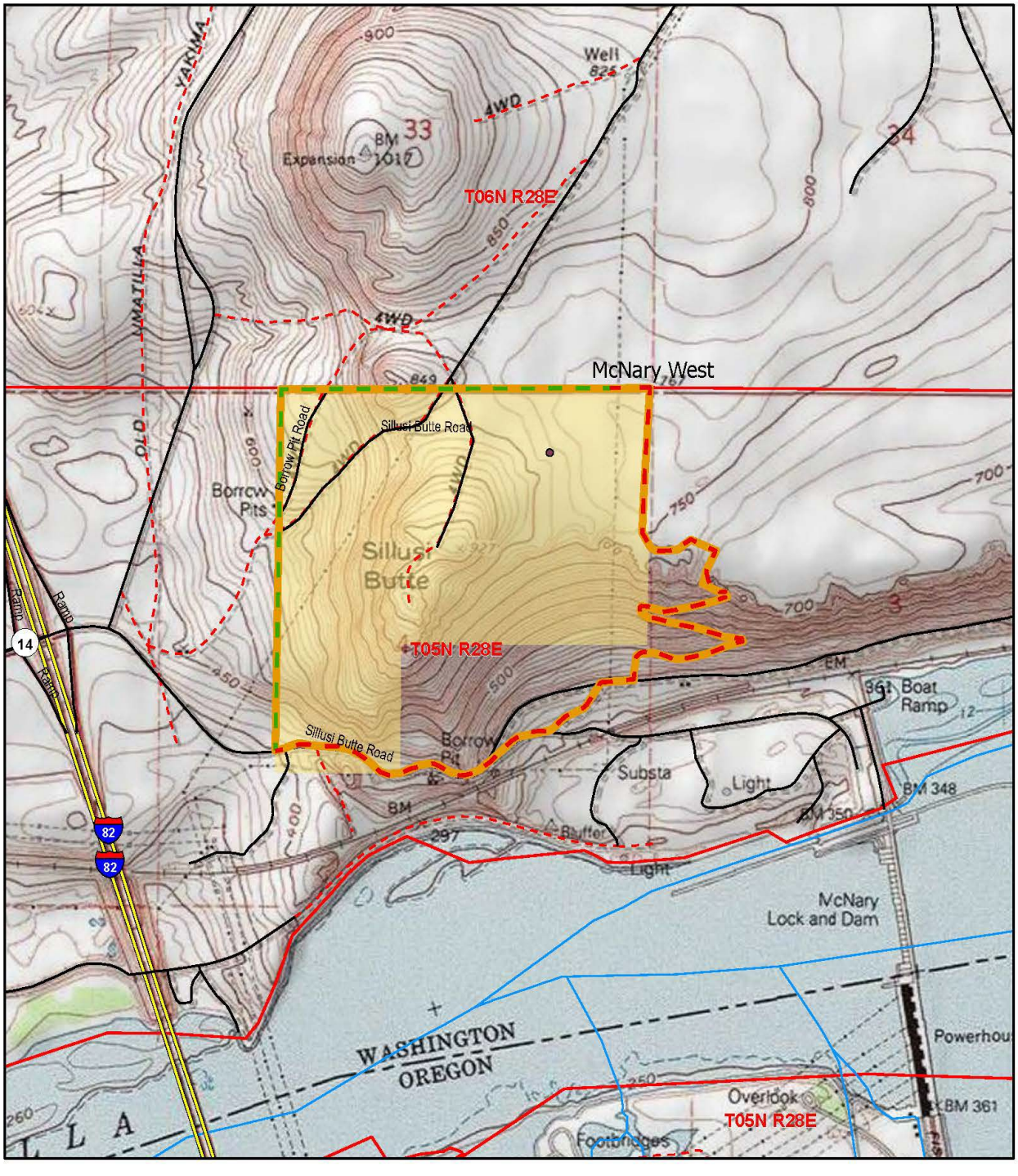


H.10: McNary Topographical

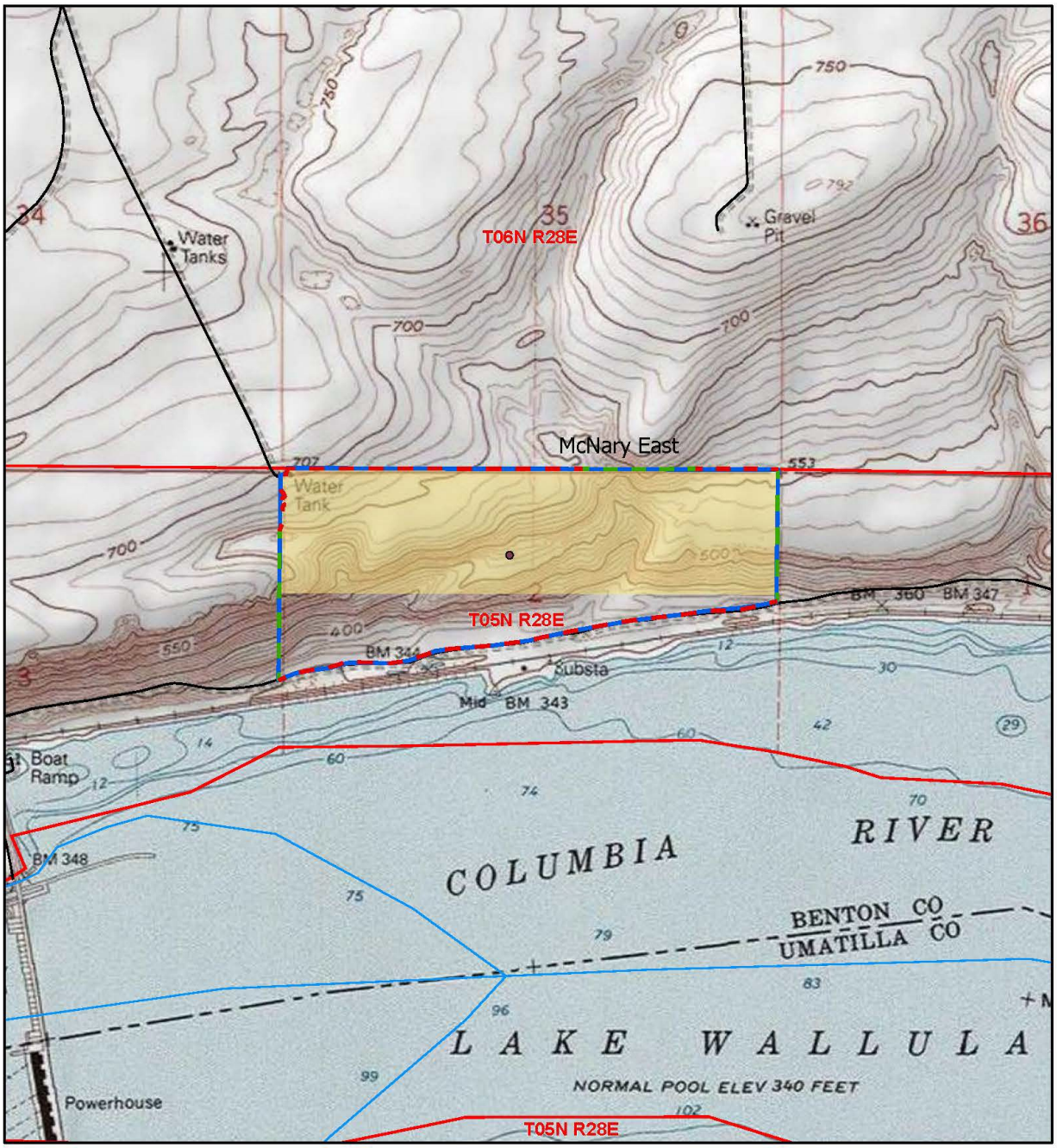


No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources and may be updated without notification. Map Credits: ESRI, Garmin

H.11: McNary West



H.12: McNary East



Legend

- McNary East Project Boundary
- Existing Features
- New Construction
- Proposed AIM Plot
- Bureau of Land Management

McNary East Fuelbreak

0 0.25 0.5

Miles

1:24,000

No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources and may be updated without notification. Map Credits: ESRI, Garmin

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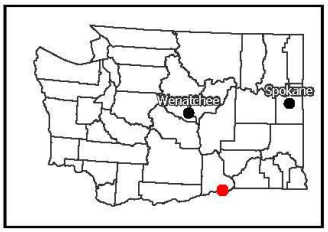
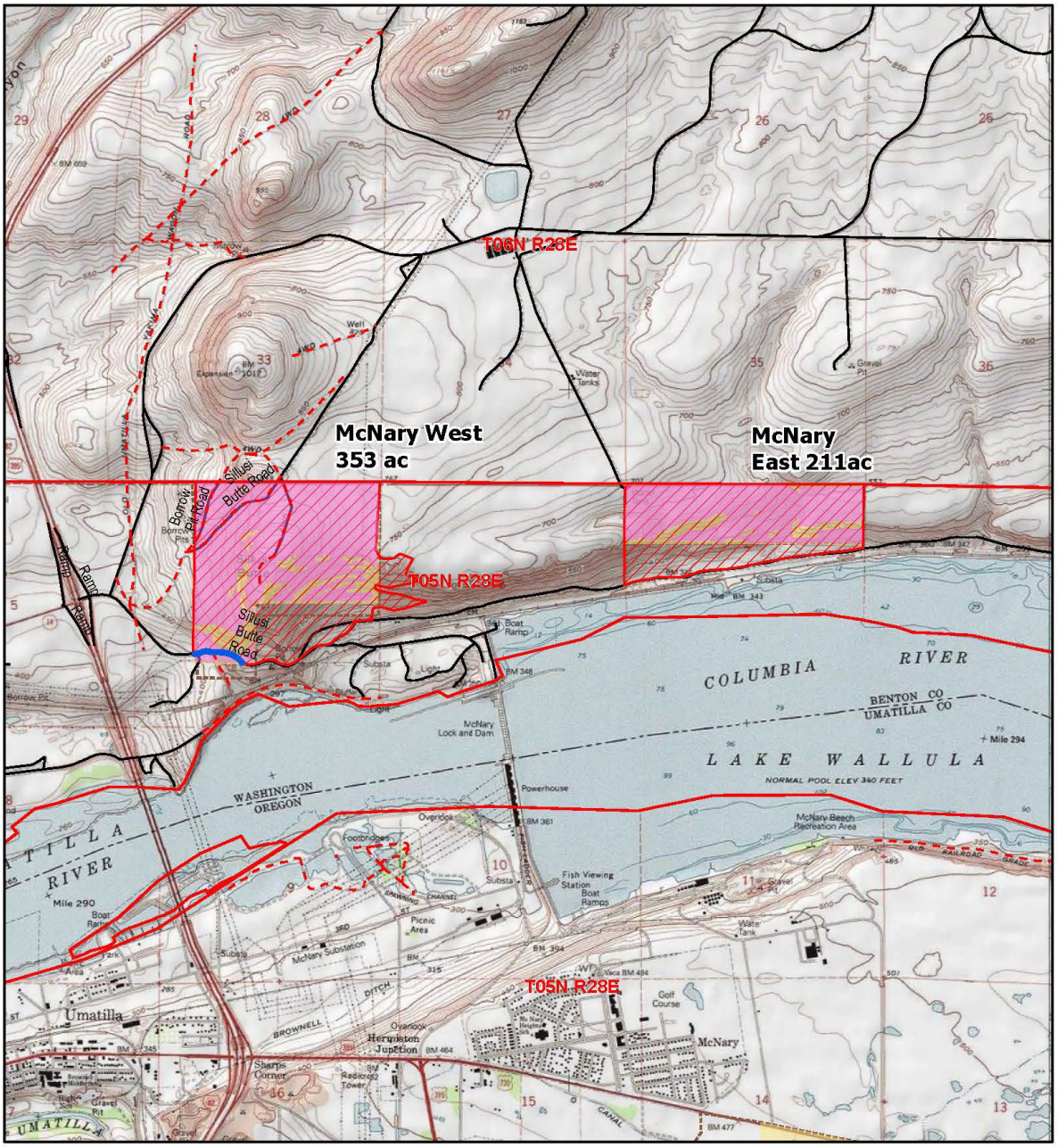
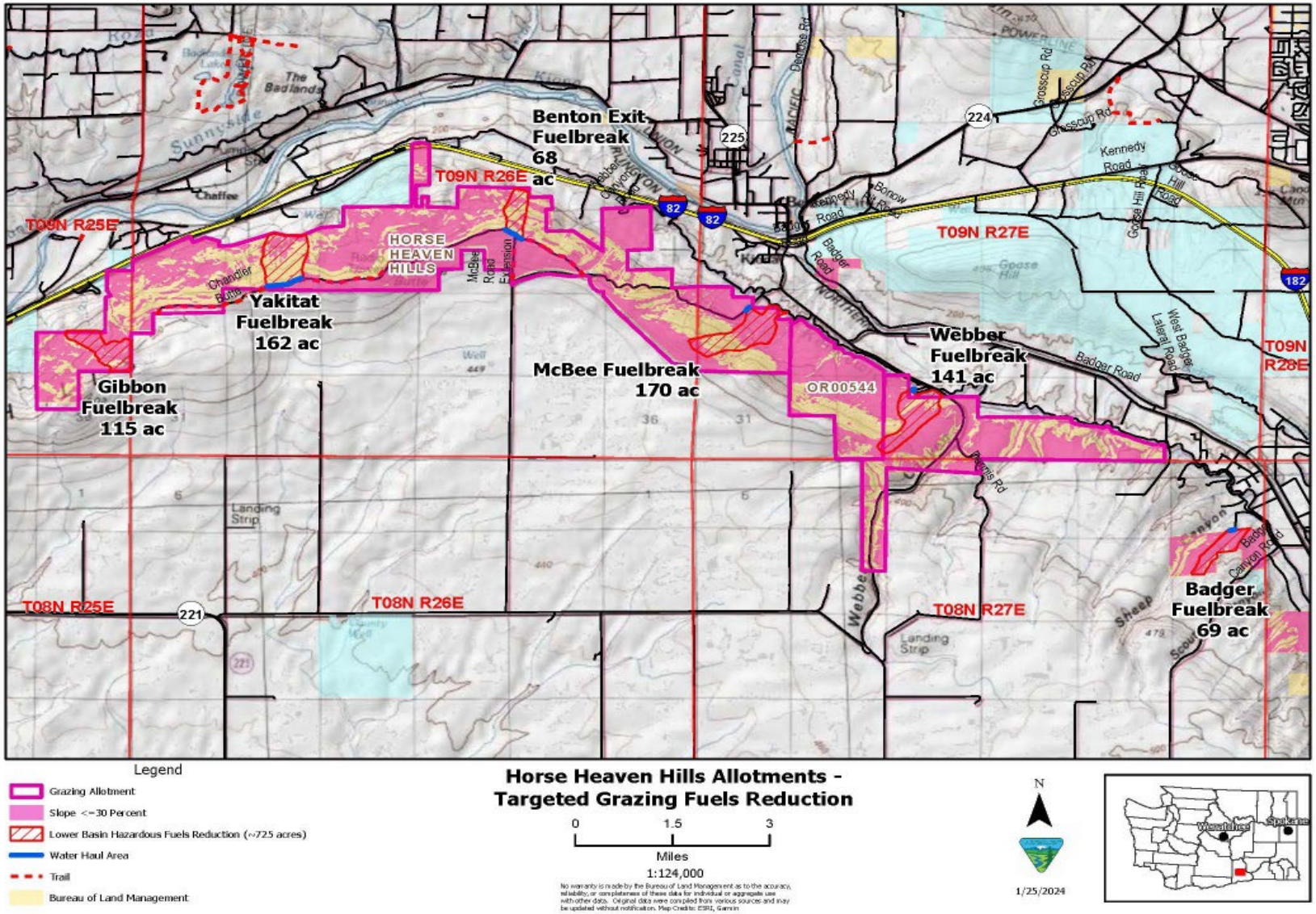
1/16/2024



H.13: McNary Targeted Grazing with Slope and Water Haul Locations



H.14: Horse Heaven Hills Targeted Grazing with Slope and Water Haul Locations



G. Visual Resource Management (VRM)

UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF LAND MANAGEMENT **VISUAL CONTRAST RATING WORKSHEET**	Date: 1/9/24 District/ Field Office: Spokane District Office Resource Area: Border Field Office Activity (program): Fuels

SECTION A. PROJECT INFORMATION

1. Project Name: Lower Basin Hazardous Fuels Reduction	4. Location Townships_5N,8N,9N_	5. Location Sketch
2. Key Observation Point: KOP #1	Ranges_25E,26E,27E, 28E_	
3. VRM Class: II	Sections_2,3,4,12,14,20,23,25,30,32,33_	

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Transition from urban developed valley floor to high-rising hills sweeping east to west. Ranges from FG urban zone and hillside FG to MG.	Uniform prominent low rounded grasses in FG to MG.	In immediate FG developed structures transitions to high-rising hillside and rolling grasslands with diagonal road in FG to MG.
LINE	Complex urban valley floor transitions to uniform open hills with silhouette horizontal ridgeline and sweeping vertical lines from ravines.	Silhouette line of horizontal ridgetop with long sweeping line horizontally of grasslands with vertical ravines.	Weak diagonal line of county road in FG to MG along horizontal hillside.
COLOR	In FG greys and developed structures that transition to FG and MG monotone dark green cheatgrass and other grasses.	Uniform dark green grasses, with darker shade green-grey vertical ravines.	Very dark green of county road in FG to MG.

TEX-TURE	Dense, coarse urban structures in immediate FG transitions to fine grain sparse density in FG to MG.	Fine grains of grass vegetation with even regularity in FG to MG.	Urban structures in immediate FG are uniform high contrast compared to ordered smooth hillside in FG to MG.

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	N/A	Temporary vertical burn patches in FG to MG.	N/A
LINE	N/A	Temporary bold vertical burn patches, gradually dissipating.	N/A
COLOR	N/A	Mottled black or grey vertical patches on hillside.	N/A
TEX-TURE	N/A	Fine grain, uneven random, sparse.	N/A

SECTION D. CONTRAST RATING _X_SHORT TERM ___LONG TERM

1. DEGREE OF CONTRAST		FEATURES												2. Does project design meet visual resource management objectives? _X_Yes ___No (Explain on reverse side) 3. Additional mitigating measures recommended ___Yes _X_No (Explain on reverse side)
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)				
		STRONG	MODERATE	WEAK	NONE	STRONG	MODERATE	WEAK	NONE	STRONG	MODERATE	WEAK	NONE	
ELEMENTS	FORM				X			X					X	
	LINE				X			X					X	
	COLOR				X			X					X	
	TEXTURE				X				X				X	

														Evaluator's Names	Date
														Stephen Smith	1/9/24
														Paul Ratcliff	

SECTION D. (Continued)

Comments from item 2.

Project meets Class II objectives because the source of temporary visual contrast, namely darkened vegetation due to wildland fire (a naturally occurring phenomenon), is lessened in scale, intensity, and regularity (all of which contribute to level of change), due to project activities. Otherwise, due to mitigating project features including broadcast burns over ridgelines and within ravines, the level of change to the characteristic landscape is low. The activity does not dominate the view and is not the major focus of viewer attention.

Additional Mitigating Measures (See item 3)

No additional mitigation measures are required since the temporary basic form elements of the project, darkened vegetation from broadcast burns, on the landscape are already minimized via placement over ridgetops and within ravines. Location and amount of disturbance are also dictated by where temporary fire scars would likely otherwise naturally occur, likely in a manner causing worse visual contrast. Only minimal color modifications are visible from the KOP.

Key Observation Point Overview (VRM)

Key Observation Point Photograph (VRM)