U.S. Department of Interior

Bureau of Land Management

North Huckleberry Pile Burn

Environmental Assessment

For more information, contact:
Allen Gardner, Project Lead
BLM Border Field Office
1103 North Fancher Rd.
Spokane, WA 99212
(509) 536-1200

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North Huckleberry Pile Burn
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INTRODUCTION

The Bureau of Land Management (BLM), Border Field Office proposes to burn piles of slash created during the harvest and understory fuels treatment of four forest health projects in an area of Stevens County approximately 10 air miles southwest of Chewelah, WA. The four projects were: Carr's Corner, Lane Mountain, Red Marble, and Red Quarry.

The BLM conducted four forest health projects that generated slash. The forest health projects included commercial timber harvest, precommercial thinning, and burning. The purpose of these projects was to improve stand health, reduce stocking levels, reduce fuel ladders, and reduce the potential for catastrophic stand replacement fire. The total area for the four forest health projects was 882 acres. The slash was piled at approximately 83 landings. Carr's Corner understory thinning hand piles are scattered throughout that sale area. Piles range in size from 5 to 7 feet in diameter for hand piles and 25 to 40 feet in diameter for landing piles. There are 4 landing piles in the Lane Mountain project area and 25-30 piles in each of the remaining sale areas. In addition, there are 2,695-3,080 hand piles (7-8 piles per acre) on 385 acres within the Carr's Corner sale area. The total area occupied by piles is approximately 5 acres (2.4 acres landing piles, 2.6 acres hand piles). Typically, slash piles occur on relatively flat ground (0-20 percent slope). The project is located in T. 31 N., R. 39 E, Willamette Meridian (see attached project maps).

PURPOSE AND NEED

The purpose and need for this project is to reduce fuel loading associated with slash piles and reduce the likelihood of a catastrophic wildfire. The decision to be made is whether to allow the slash piles in the four project areas to be burned.

LAND USE PLAN CONFORMANCE

This project is in conformance with the Spokane Resource Management Plan/EIS (BLM 1985). The RMP (p. 22) indicates that slash will be removed where it poses a potential fire hazard and that the preferred method of disposing of slash will be with the use of prescribed fire.

SCOPING

Internal scoping was used in the development of this environmental assessment.

ALTERNATIVES

Two alternatives have been developed to respond to the Purpose and Need identified during internal scoping: Alternative 1 (Proposed Action) and Alternative 2 (No Action).

Alternative 1 (Proposed Action)

The BLM is proposing to burn landing piles along roads within the four forest health project areas and hand piles distributed throughout the 385-acre Carr's Corner project area (see four maps at the end of this document).

Project Design Features

Fuels Management

- Pile burning would be accomplished consistent with the recommendations and requirements of the Washington Smoke Management Plan. Requirements include writing a burn plan, obtaining a burn permit, burning under conditions that encourage complete combustion of smaller fuels within the burn period, and burning under conditions that would not generate impacts to Smoke Sensitive Receptor Areas, Class 1 airsheds, or other areas sensitive to smoke.
- Burn plans would address burning objectives and operational concerns, identify mitigation measures necessary to protect site-specific resource values, and describe notification procedures for local area residents.
- Hand and landing piles would be burned in the late fall or early winter when fire would not spread beyond the edge of the piles, yet allow for 75-100 percent consumption of biomass.
- Pile burning would occur during the late fall or early winter when soil and duff moisture is high to protect soils but prior to persistent rain.
- No burning would occur within riparian habitat areas.
- At least one engine with crew would be on site during all burning operations. All piles would be monitored to assure there are no escaped fire incidents. No piles would be ignited on or within 25 feet of property boundaries. An Archaeologist would determine if there are piles which need to be retained to preserve cultural features. Piles to be retained would be flagged.
- Prescribed fire would be contained within 15 feet of each pile.

Cultural Resources

- An assessment of cultural site localities in relation to the pile locations was field reviewed in October 2014. Potentially impacted cultural resource sites were flagged and excluded from burn areas and buffers were established between piles where needed to protect cultural sites.
- If previously unknown archaeological sites are encountered during project implementation, the activity would be halted, the authorized BLM official would be contacted, and the resource protected until a BLM archaeologist has assessed the significance of the resource.

Vegetation/Special Status Plants

- All known special status plant species occurrences have been avoided during the thinning and piling phases in each area.
- If any Special Status Plant species are found prior to or during implementation, an agency botanist would be contacted and appropriate mitigation measures such as buffering or avoiding the site would be established.

Noxious Weeds and Invasive Plants

- All hand piles and landing piles would be visually monitored within 6 months post-fire to assess the degree of soil disturbance and the presence of noxious weeds and invasive plants. Weed infestations comprising greater than 25% of the total plant cover in the burn scars may be treated with mechanical, chemical, or biological methods to achieve plant community objectives.

Recreation

- Prescribed burning activities would be completed in the late fall or early winter, outside of the high visitation or recreational use periods (hunting seasons, scheduled recreational activities, etc.).
- The BLM would notify the public of burning activities through outreach and signage prior to prescribed fire activity.

Monitoring

All burned areas would be monitored post burn for possible fire escape and assurance that all fires are completely extinguished.

Alternative 2 (No Action)

No prescribed burning activities would occur under this alternative. Current conditions would continue unabated, fuel loading would remain high, providing multiple ignition points. Accumulation of woody material in the project area would increase the risk of catastrophic wildfires that could become stand-replacing in severity and threaten the Wildland Urban Interface (WUI).

Table 1: Resources Considered in the Impact Analysis:

Resource	Not Present	Present Not Impacted	Present Impacted	Rationale
Access		X		The proposed pile burning activities would not alter any access.
Air Quality		X		Burning operations would be designed to minimize any impacts to air quality. Burning would only occur under conditions that would not generate impacts to Smoke Sensitive Receptor Areas, Class 1 airsheds, or other areas sensitive to smoke.
Areas of Critical Environmental	X			

Resource	Not Present	Present Not Impacted	Present Impacted	Rationale
Concern				
Cultural Resources		X		The project area has been surveyed. Identified sites would be avoided by buffers or by exclusion from the project activities.
Economic and Social Values		X		The proposed action would not result in any measurable economic impact.
Environmental Justice		X		Burning slash piles would not have a disproportionately high or adverse effect on low income or minority populations. Reducing fuel loads and the risk of catastrophic wildfire benefits any visitors or residents in the area.
Fisheries		X		No burning would occur in riparian habitat areas.
Floodplains	X			
Forest Resources		X		Reducing fuel loads would reduce the risk of catastrophic wildfire and maintain the health of forest resources.
Noxious Weeds and Invasive Plant Species			X	Slash pile treatments may result in soil disturbance and loss of desirable vegetative cover that would favor weed spread.
Mineral Resources		X		Burning slash piles would not affect any mineral resource.
Migratory Birds		X		Three migratory birds of conservation concern may be present in the parcel, but due to the short term nature and small footprint of the project will not be affected: Calliope humming bird, olive-sided and willow flycatchers.
Paleontological Resources	X			Based on field surveys, no paleontological resources have been identified.
Prime and Unique Farmlands	X			
Soil Resources			X	Temporary hydrophobic and sterilized soils may occur under landing pile locations
Threatened, Endangered, and Sensitive Plants	X			No TES plants were identified during surveys.
Threatened, Endangered, and Sensitive Animals		X		The following sensitive species are present in the analysis area, but due to the short term nature and small footprint of the project will not be affected: gray wolf, little brown bat, Townsend's big-eared bat, pygmy shrew, and Lewis' and white-headed woodpeckers.
Threatened, Endangered, and Sensitive Fish	X			No TES fishes are present in the analysis area.
Range Resources	X			The area is not part of a range allotment.
Recreational Use		X		By applying design features, and due to the short timeframe of the project, impacts to recreational activities will be negligible.
Tribal Treaty Rights and Interests		X		This project is located within the traditional use area of the Spokane Tribe of Indians and the Confederated Tribes of the Colville Reservation.

Resource	Not Present	Present Not Impacted	Present Impacted	Rationale
Vegetation		X		Areas under the piles (approximately 5 acres) would be affected due to high heat under the piles. Revegetation is expected within 6 months.
Visual Resources		X		The project area is within a Visual Resource Inventory Class IV; no visual resource management class has been established. Impacts to existing visual quality would be temporary as vegetation is expected to re-establish within a short timeframe (6 months).
Wastes, Hazardous and Solid	X			
Water Quality (Surface and Ground)		X		Burning would not occur in riparian habitat areas. Water quality would not be affected.
Wetland and Riparian Zones		X		Burning would not occur in riparian habitat areas and wetlands.
Wild and Scenic Rivers	X			
Wild Horse and Burro HMAs	X			
Wilderness	X			
Wildlife Resources		X		The following sensitive species are present in the analysis area, but due to the short term nature and small footprint of the project will not be affected: gray wolf, little brown bat, Townsend's big-eared bat, pygmy shrew, and Lewis' and white-headed woodpeckers.

Affected Environment & Environmental Consequences

Soils

Affected Environment

The Huckleberry Silt Loam soil complex underlies a majority of the project area. This is a moderately deep well drained soil on foot slopes, sides and ridgetops of mountains. Typically the surface of this soil is covered with a mat of partially decomposed organic litter about 2 inches thick. The permeability is moderate and the available water capacity is high. The effective rooting depth is 20-40 inches. Runoff is rapid and the hazard of water erosion is high. This soil is used for woodland.

Environmental Consequences

Alternative 1 (Proposed Action)

Direct and Indirect Effects

The project activities or mechanisms that may directly affect soil resources would be limited to a

5 by 7-foot area for the hand piles and the exposed soil where landing piles are located. Fire intensity would be low to moderate for the hand piles because pile burning would take place when soil moisture is high such that the existing root systems would be preserved thus preventing wind or water erosion.

Fire intensity for landing piles would be moderate to high. Soils in the landing pile footprints may become hydrophobic and sterilized over the short term (2-5 years). Burning when soil moisture is high would help prevent creation of hydrophobic or sterilized soil conditions.

Overall, the effects of prescribed fire treatments on soil resources are anticipated to be short-term and minor.

Cumulative Effects

The net treatment area would be 5 acres (0.6 percent of the project area). There are no reasonably foreseeable cumulative effects associated with this action such as wind and water erosion.

Alternative 2 (No Action)

Direct and Indirect Effects

This alternative would not remove any of the residual fuels associated with the Red Marble, Carr's Corner, Red Quarry and Lane Mountain forest health projects.

Cumulative Effects

There are no reasonably foreseeable projects that would add to the cumulative effects.

Vegetation/Noxious Weeds and Invasive Plants

Affected Environment

Forest vegetation for the pile burning sites (Carr's Corner, Red Quarry, Red Marble, and Lane Mt.) includes a mixed-conifer forest dominated by grand fir and Douglas-fir with minor amounts of western red cedar and ponderosa pine.

Mountain maple (*Acer glabrum var. Douglasii*) dominates the shrub layer. Other species include pipissewa (*Chimaphila umbellate*), twinflower (*Linnaea borealis*), Oregon boxwood (*Pachistima myrsinites*), thimbleberry (*Rubus parviflorus*), ninebark (*Physocarpus malvaceus*), snowberry (*Symphoricarpos albus*), and Scouler's willow (*Salix scouleri*). Herbs include: Queen's cup beadlily (*Clintonia uniflora*), starry false lily of the valley (*Smilacina stellate*), rattlesnake plantain (*Goodyera oblongifolia*), white hawkweed (*Hieracium albiflorum*), and sweet cicely (*Osmorhiza* sp.).

Some burn piles are within less common habitats that occur on dry ridge-tops and south facing slopes. These areas are dominated by Douglas-fir and ponderosa pine with an understory shrub layer dominated by ninebark, oceanspray (*Holodiscus discolor*), snowberry, snowbrush ceanothus (*Ceanothus velutinus*), Saskatoon (*Amelanchier alnifolia*), and Scouler's willow.

Noxious weed and invasive plant populations occur in low densities within the project areas. In general, these species are more prevalent in disturbed sites, such as roadsides or areas that have been harvested and burned. Some noxious weeds and invasive plant populations are present in undisturbed sites. Table 2 lists the Washington State noxious weeds and invasive plants known to occur within the project areas.

Table 2. Noxious Weeds and Invasive Plants within the Project Areas

Common Name	Scientific Name	Weed Class*
Diffuse Knapweed	*Centaurea diffusa*	B
Musk Thistle	*Carduus nutans*	B
Rush Skeletonweed	*Chondrilla juncea*	B
Houndstounge	*Cynoglossum officinale*	B
Oxeye Daisy	*Leucanthemum vulgare*	B
Dalmatian Toadflax	*Linaria dalmatica ssp.dalmatica*	B
Sulfur Cinquefoil	*Potentilla recta*	B
Canada Thistle	*Cirsium arvense*	C
Bull Thistle	*Cirsium vulgare*	C
Common St. Johnswort	*Hypericum perforatum*	C
Cheatgrass	*Bromus tectorum*	Invasive, not designated in WA
Tumble Mustard	*Sisymbrium altissimum*	Invasive, not designated in WA
Common Mullein	*Verbascum thapsus*	Invasive, not designated in WA

*Weed Class B = Non-native species that are either absent from or limited in distribution in some portions of the state but very abundant in other areas. The goals are to contain the plants where they are already widespread and prevent their spread into new areas.
Weed Class C = Non-native plants that are already widespread in Washington State. Counties can choose to enforce control, or they can educate residents about controlling these noxious weeds.

Environmental Consequences

Alternative 1 (Proposed Action)

Direct, Indirect and Cumulative Effects

Burning the hand and landing piles would directly impact approximately 5 acres of vegetation. Surveys for special status plants were done in 2003 and 2004. No known special status plants were found in this project area. High quality habitat for special status plants does occur in and adjacent to the project area. If special status plants are found prior to or during implementation design features (see page 3) are in place to avoid or minimize impacts.

Pile burning on approximately 5 acres within the 882 project area would create bare soil conditions favorable to invasion by noxious weeds and non-native plants. The removal of existing vegetation and the flush of soil nutrients from burning treatments may contribute to increased germination and establishment of plants (Esquilin et al. 2007, Korb et al. 2004). Although exposing mineral soil would increase susceptibility of weed expansion, the risk is considered low. Since noxious weeds and invasive plants are currently at low densities within the project areas, weeds are expected to remain at low levels. Additionally, post-burn seeding of the unburned areas would help establish desired vegetation.

Substantial changes in forested plant community structure or composition are not anticipated with this project and would not contribute to a decline of forest lands within the project areas. Indirectly, the proposed action would may increase the density and distribution of noxious weeds and invasive plants on approximately five treated acres (0.6 percent of the analysis area), but would not result in discernable changes across the 882-acre analysis area. Cumulatively, noxious weeds and invasive plants may increase as a result of pile burning added to the past forest health treatments and road use.

Alternative 2 (No Action)

Direct, Indirect and Cumulative Effects

The No Action Alternative would leave the slash piles on site to slowly decompose over time. There would be no direct, indirect or cumulative effects to native vegetation or noxious weeds and invasive plants because no burning would take place.

Cultural Resources

Affected Environment

The Carr's Corner, Red Quarry, Red Marble, and Lane Mountain project areas were inventoried for cultural resources prior to timber sale operations in 2008, 2009, and 2011. The majority of sites recorded in these areas are mining-related with the most numerous of these located in the Carr's Corner project area. No sites were recorded in the Lane Mountain project area. The site types recorded in the other three forest health projects areas include adits, shafts, prospect pits, miners' cabins, debris scatters, and an aerial tramway which transported ore from the mountains to the valley below.

This project area is located within the traditional use area of the Spokane Tribe of Indians and the Confederated Tribes of the Colville Reservation (Ray 1936, Spier 1936). It is likely that other groups also used this and nearby areas for seasonal hunting, fishing, and gathering of food and subsistence resources. No prehistoric sites were identified during the Class III inventories. The Spokane Tribe of Indians, Colville Confederated Tribes and the Department of Archaeology and Historic Preservation were initially consulted for the Carr's Corner and Red Quarry projects in April 2008 and consultation concluded in October 2008. The same groups were notified of the proposed Red Marble project in March 2009 and consultation concluded in August 2009. Consultation for the Lane Mountain project was initiated in September 2011 and concluded in November 2011. Updated consultation on disposal of the piles began in February 2014 and was completed in November 2014. Tribal groups did not identify any new concerns with the proposed pile burning project.

There are no known paleontological resources in the project areas nor is there high potential for their existence due to the highly metamorphosed (altered) bedrock geology of the area.

Environmental Consequences

Alternative 1 (Proposed Action)

Direct, Indirect and Cumulative Effects

Known cultural resources would be protected by 10 to 50-foot buffers established around sites that were identified to be at risk from pile burning (the varying buffer distance is directly related to the size of the pile and potential for off pile fire creep). All of the sites that were identified to be at risk from the proposed pile burning were inspected in October 2014 and flagged at that time. Project leads were notified of piles that should not be burned and provided maps and UTM coordinates. Therefore, there should be no direct or indirect effects to known cultural resources within the project area. No impacts to Paleontological Resources are anticipated due to the low probability of their existence in the project area.

Burning the piles may allow for better historical aesthetic value by allowing for a more natural appearing landscape.

No other actions were identified that would contribute to cumulative effects to cultural resources

Alternative 2 (No Action)

Direct, Indirect and Cumulative Effects

There would be no direct, indirect or cumulative impacts to cultural resources from leaving the piles unburned. However, the piles add to short-term fuel loading that would contribute to higher burn intensities and spread rates in the event of a wildfire. Wildfire would adversely affect cultural sites in and outside of the project area.

Air Quality

Affected Environment

Prescribed fires and wildfires are potential sources of air pollutant emissions. The amount of emissions depends on the size and intensity of the fire (determined by meteorological conditions such as temperatures and wind speed and direction); the fuel type and fuel moisture content (including age class, size, and mixture of vegetation types); and the available fuel loading (the total mass of combustible fuels).

The nearest residence to the proposed burn area is 0.1 miles. Air quality in the analysis area is considered good based on EPA air quality standards.

Environmental Consequences

Alternative 1 (Proposed Action)

Direct and Indirect Effects

Under Alternative 1, prescribed fire activities would result in short-term (2-5 days) effects in the immediate vicinity of the project area. Prescribed fire treatments would be conducted in compliance with an approved burn plan and state-issued burn permit. These two documents would establish criteria for burning activities, such as meteorological conditions, season, and treatment acreages, such that treatment activities would have only short-term minor adverse effects to local air quality. Burn plans and smoke permits would not be approved or allowed if the proposed treatments were expected to result in major effects to smoke sensitive areas, effects to nonattainment areas, or any exceedances of NAAQS (National Ambient Air Quality Standards).

The effects of burning piles would be within the permissible PM_{10} criteria and short-term in duration (2-5 days). Smoke is expected to remain at nuisance or negligible levels rather than at levels that could impair human health.

Impaired visibility in the immediate area of burning is possible. The BLM and prescribed fire managers would coordinate directly with nearby residents to ensure that they are aware of the fire treatments and potential hazards. It is not expected that visibility would be reduced such that driving safety would be impaired.

The proposed fuels reduction treatments would, in the long term, result in a reduction of potential emissions during potential future wildfire events in the project area by reducing the availability of fuels. In the long term (30+ years), reduced fuel loads throughout the project area would have a minor effect on severity and extent of air quality effects as a result of future wildland fires.

In addition to potential smoke effects from fire treatments, the operation of heavy equipment and vehicles under Alternative 1 would generate low levels of and exhaust emissions. Air quality effects as a result of these emissions would be short term and negligible, and would be localized to active treatment units.

Cumulative Effects

At the site scale, short-term (2-5 days) emissions from burning piles would be combined with smoke from woodstove emissions from private residences near the project area. On a regional scale, however, the Proposed Action would have no cumulative effect on air quality, as the project area is largely insignificant compared to the burnable area in proximity to population centers or smoke sensitive areas.

Alternative 2 (No Action)

Direct, Indirect and Cumulative Effects

The No Action Alternative would have no direct, indirect or cumulative effects on local or regional air quality.

Climate Change

Affected Environment

In the dry, fire prone forests of the western U.S., wildfire size and severity have been increasing as a result of changing climatic conditions and past management activities (Wiedinmyer and Hurteau 2010, p. 1930-1931). The proportion of fuel combusted during a fire event tends to increase with increasing burn severity (degree to which a site has been altered or disrupted by fire). Prescribed fires are typically less severe than wildfires since they are implemented when atmospheric conditions are stable and fuel moisture is high enough to maintain flame length, combustion, and spread rates within prescription.

Forests store large amounts of carbon in live and dead wood and soil and play an active role in controlling the concentration of CO_2 in the atmosphere. In the U.S. in 2003, carbon removed from the atmosphere by forest growth or stored in harvested wood products offset 12-19 percent of U.S. fossil fuel emissions (the 19 percent includes an uncertain estimate of carbon storage rate in forest soil) (Ryan et al. 2010, p. 2).

Environmental Consequences

Alternative 1 (Proposed Action)

Direct and Indirect Effects

Pile burning to dispose of slash after commercial and precommercial thinning, which is not used for biomass energy, would result in the consumption of 1 ton of biomass per acre or 882 tons of biomass for the entire project area. This is equivalent to 0.03 metric tons of carbon emissions per acre or 26.5 metric tons of carbon emissions for the project area (BLM Timber Harvest Carbon Calculator).

The total approximate combined carbon emissions for all treatments in the project area, not including carbon neutral offsets (carbon sequestration from the forest) is 1,328 metric tons of CO_2. Overall, this is a negligible effect at both the regional and global scales.

Cumulative Effects

Changes in land use patterns and forestry projects, such as commercial thinning, nationally results in a net sink of carbon dioxide of 1 billion metric tons (EPA 2009, p. 2-3); the emissions from the Proposed Action and similar actions in the area would represent less than 0.0001 percent of this net sink.

Alternative 2 (No Action)

Direct, Indirect and Cumulative Effects

Forest vegetation would continue to grow and sequester carbon, but would be more susceptible to forest insect/disease and severe wildfire. The level of greenhouse gas emissions would depend on the severity, intensity, and extent of any wildfire.

Overall, the direct and indirect effects of the No Action Alternative on greenhouse gas emissions are anticipated to be negligible. Therefore, there would be no discernable cumulative effects.

COORDINATION AND CONSULTATION

This Environmental Assessment was prepared by an interdisciplinary team of BLM resource specialists representing various resources, including soils, hydrology (water), wildlife habitat, cultural resources, forestry, fuels, and fire, with public collaboration consistent with the 2006 10-Year Strategy Implementation Plan.

The BLM will notify project partners, stakeholders, and the general public when a decision is made on the proposed project. Public notification will be disseminated through a press release and/or public notices in local newspapers or other media outlets.

LITERATURE CITED

BLM. 1985. Spokane Resource Management Plan/EIS. U.S. Department of the Interior, Bureau of Land Management, Spokane District, Spokane, WA. 202 pp.

BLM. 2004. Huckleberry Mountains Forest Management Programmatic Environmental Assessment; OR135-FY04-EA-007.

Denman, K. L., G. Brasseur, A. Chidthaisong, P. Ciais, P. M. Cox, R. E. Dickinson, and others. 2007. Couplings between changes in the climate system and biogeochemistry. In: Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovermental Panel on Climate Change. Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.) Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

EPA (U.S. Environmental Protection Agency). 2010. Climate Change Indicators in the United States. Available at http://www.epa.gov/climatechange/indicators.html. Accessed August 18, 2010.

EPA. 2009. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990 – 2007. U.S. EPA, Washington, D.C.

Esquilin, A. E. J., M. E. Stromberger, W. J. Massman, and J. M. Frank. 2007. Microbial community structure and activity in a Colorado Rocky Mountain forest soil scarred by slash pile burning. Soil Biology & Biochemistry. 39:1111-1120.

Hann, W., D. Havlina, A. Shlisky, S. Barrett, T. DeMeo, K. Pohl, and others. 2005. Interagency Fire Regime Condition Class Guidebook V. 1.2. Interagency and The Nature Conservancy Fire Regime Condition Class Website. USDA Forest Service, US Department of the Interior, The Nature Conservancy, and Systems for Environmental Management. Available at http://www.frames.gov/rcs/0/343.html. Accessed November 12, 2013.

Korb, J. E., N. C. Johnson, and W. W. Covington. 2004. Slash pile burning effects on soil biotic and chemical properties and plant establishment: recommendations for amelioration. Restoration Ecology 12:52–62.

NRCS (Natural Resources Conservation Service). 1982. Soil Survey of Stevens County, Washington. Norman C. Donaldson and Joseph T. DeFrancesco of Soil Conservation Service and Don W. Barron, Washington State Department of Natural Resources.

Ray, V. F. 1936. Native Villages and Groupings of the Columbia Basin. *Pacific Northwest Quarterly* 27(2):99-152.

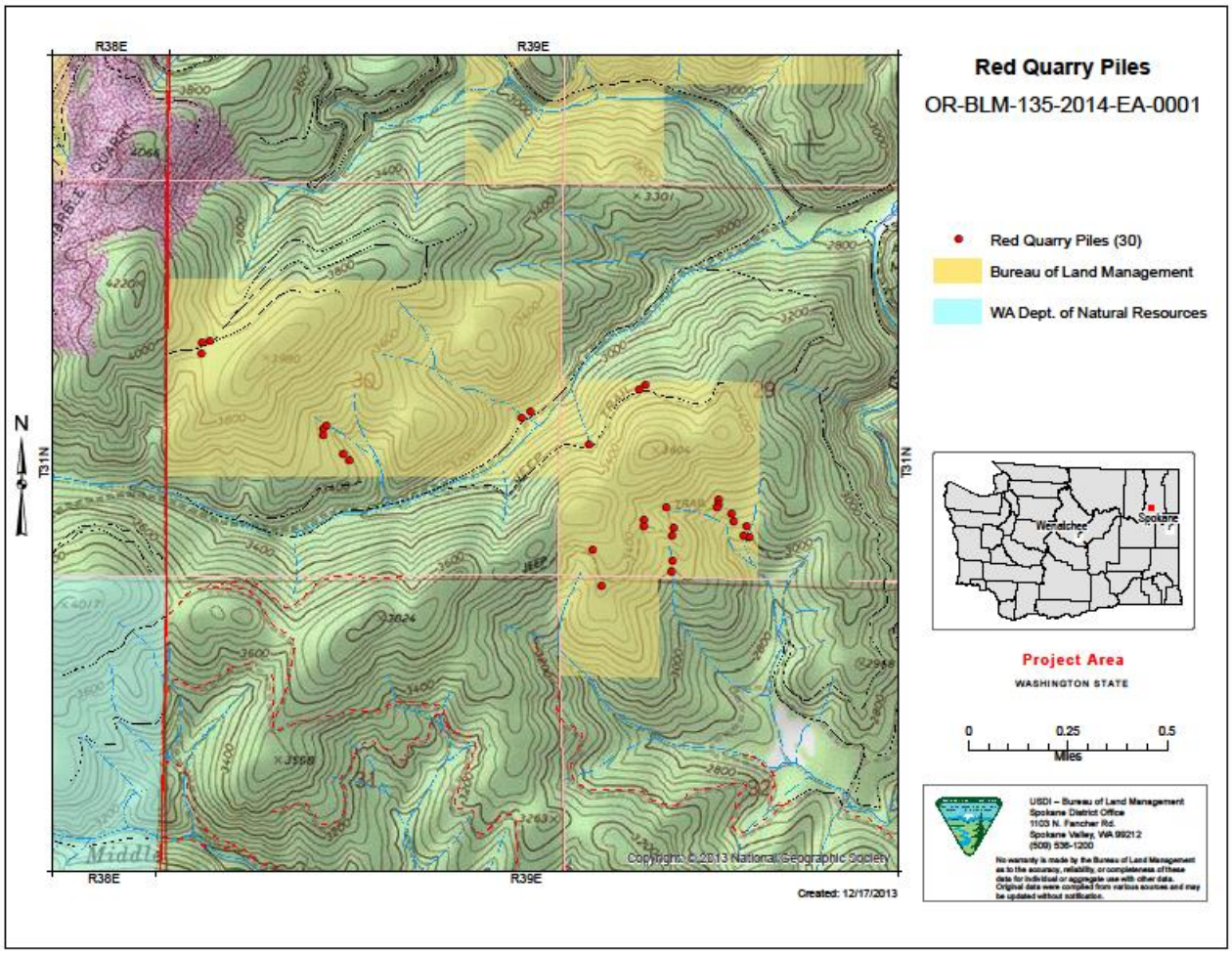
Ryan, M. G., M. E. Harmon, R. A. Birdsey, C. P. Giardina, L. S. Heath, R. A. Houghton and others. 2010. A Synthesis of the Science on Forests and Carbon for U.S. Forests. Issues in Ecology, Ecological Society of America. 16 pp.

Spier, L. 1936. Tribal Distribution in Washington. *General Series in Anthropology 3*. Nemasha, WI.

Wiedinmyer, C., and M. D. Hurteau. 2010. Prescribed Fire As a means of Reducing Forest Carbon Emissions in the Western United States. Eviron. Sci. Technol., National Center for Atmospheric Research. 1926-1932 pp.

LIST OF PREPARERS

Allen Gardner, Forester
Anne Boyd, Archaeologist
Christopher Carlton, Planning and Environmental Coordinator
Debra Plummer, Engine Captain
Elizabeth Earp, Physical Scientist
Jason Lowe, Wildlife Biologist
Kim Frymire, Botanist
Michael Fallon, GIS specialist
Michael Solheim, Fuels Technician
Sean MacDougall, Natural Resource Specialist
Steve Smith, Recreation Specialist


Red Quarry Piles
OR-BLM-135-2014-EA-0001
Red Quarry Piles (30)
Bureau of Land Management
WA Dept. of Natural Resources
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Spokane
Project Area
WASHINGTON STATE
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Spokane Valley, WA 99212
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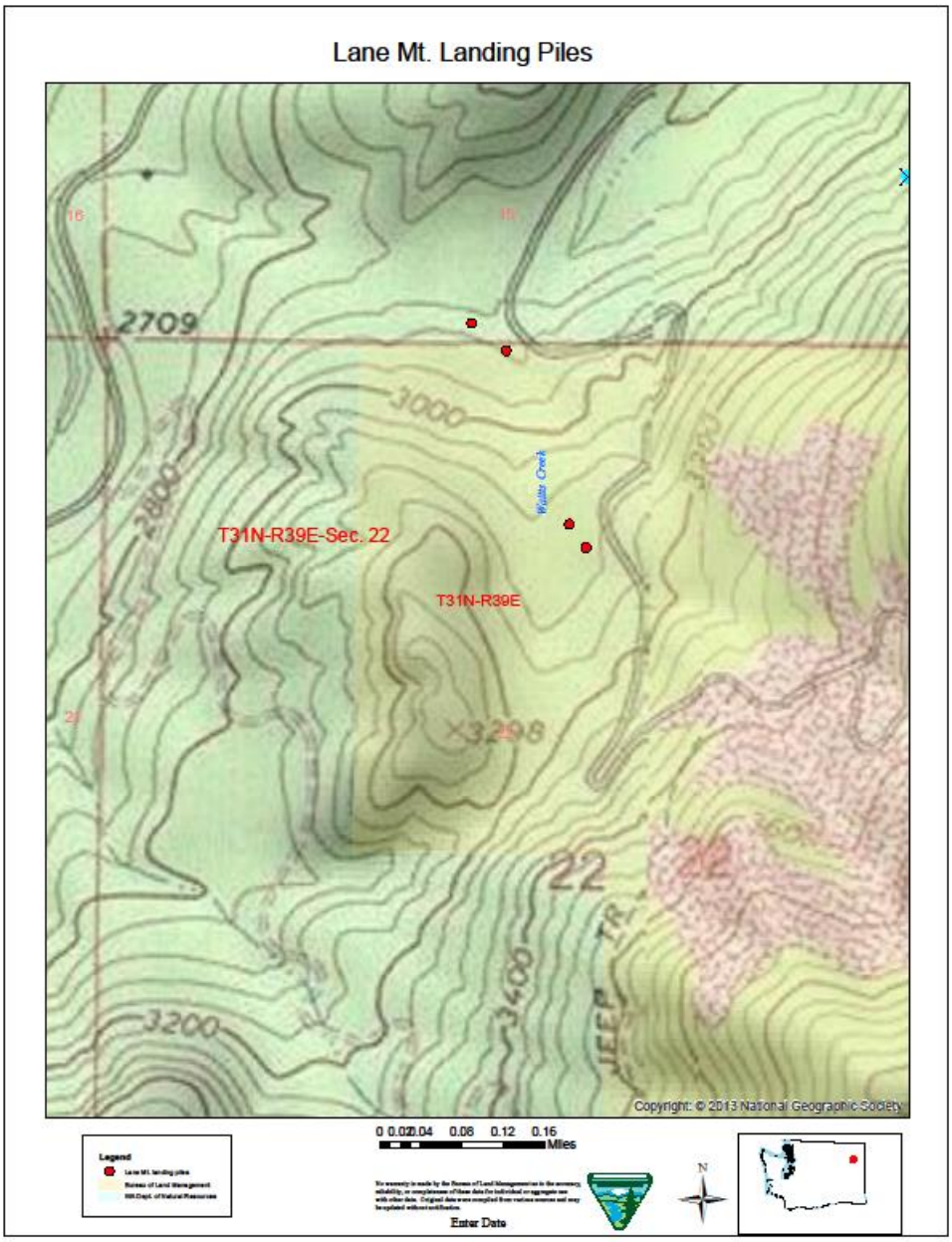
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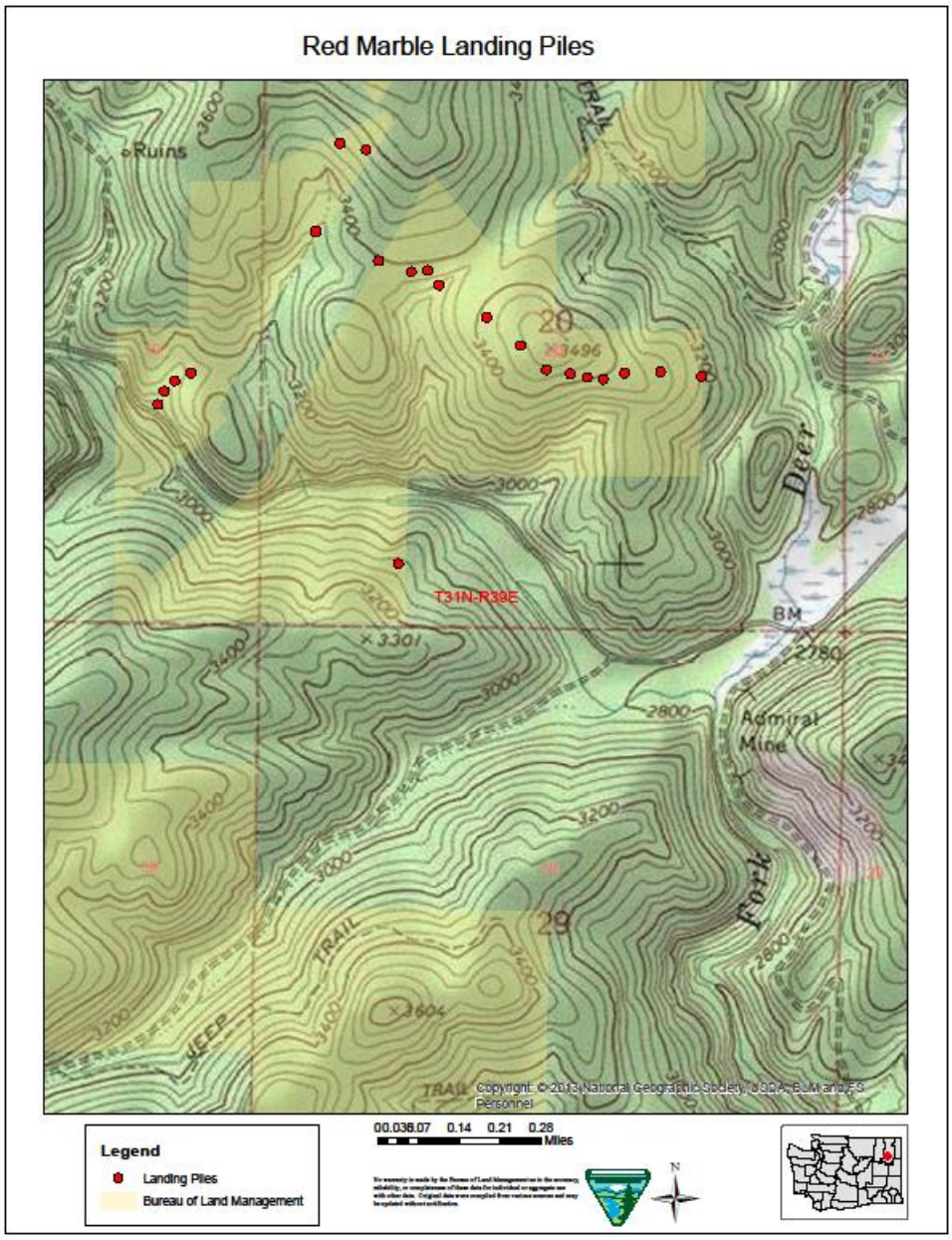
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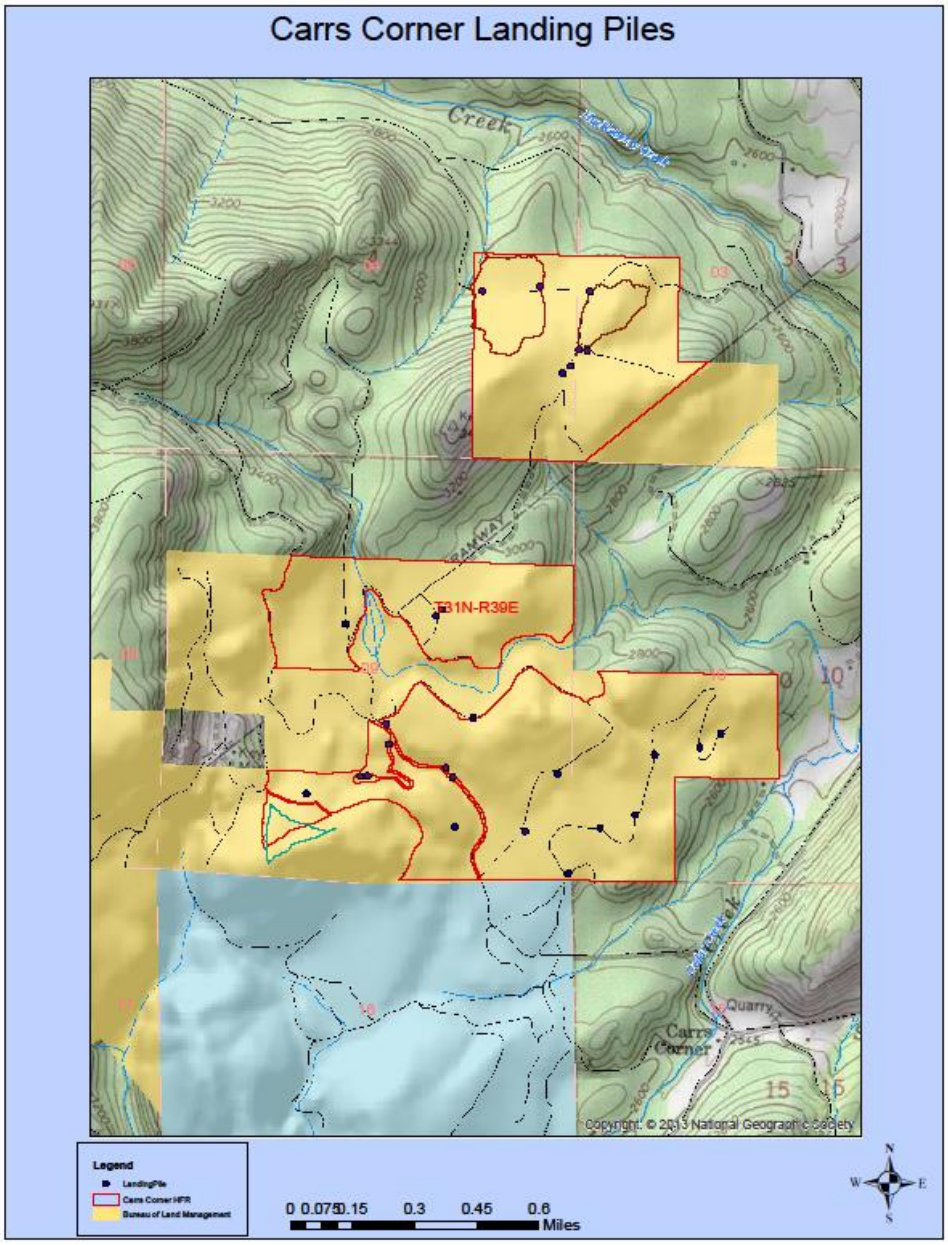
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Legend
Landing/Pile
Carrs Corner NFR
Bureau of Land Management
0 0.075 0.15 0.3 0.45 0.6
Miles
N
W
E
S