

Heritage Specialist Report

Flagtail

Fire Recovery Project



Malheur National Forest
Blue Mountain Ranger District

Grant County, Oregon

/s/ Cheryl Bradford
Cheryl Bradford, Heritage Specialist

2/5/04
Date

/s/ Patrick Haynal
Patrick Haynal, Heritage Specialist

2/9/04
Date

Abstract

Baseline resource condition, resource stresses, pertinent laws and regulations, for prehistoric archaeological properties, historic archaeological properties, and resources of contemporary tribal interest in the Flagtail Fire Recovery Affected Environment are characterized in support of the Flagtail Fire Recovery Environmental Impact Statement. Tribal consultation, public involvement, and cultural resource inventory survey strategies are outlined. Historic land-use in the planning area is summarized. Direct, indirect, and cumulative effects of post-fire harvest, fuels reduction, access management, reforestation, wildlife and watershed improvement activities on cultural resources under each of the five proposed alternatives detailed in the EIS are evaluated. Project design mitigation elements for avoiding or minimizing adverse impacts on cultural resources are described. This report concludes that there will be no direct effects to cultural resources under any of the five proposed alternatives and that potential indirect and cumulative effects are minimal and that the Malheur National Forest is in full compliance with the National Historic Preservation Act

Table of Contents

Introduction	1
Regulatory Framework	1
Consultation with Others	2
Desired Future Condition	3
Existing Condition.....	3
Project Location.....	3
Environment.....	3
Historic Range of Variability.....	5
Cultural Context	6
Identified Cultural Resources.....	7
Previous Projects.....	8
Environmental Consequences.....	9
Direct and Indirect Effects.....	9
Alternative 1 (No Action Alternative).....	9
Alternatives 2, 3, 4 and 5.....	10
Cumulative Effects	11
Consistency with the Forest Plan	12
Irreversible and Irretrievable Resources.....	12
Mitigations.....	12
References Cited.....	17
Table 1 – Soil Erodibility and Relevant Properties.....	6
Table 2 – Soil Burn Severity	7
Table 3 – Identification of Hines Railroad Spurs in Relationship to Cut Units and Method of Logging.....	15
Appendix A - Heritage Site List.....	A-1

Introduction

The purpose of this report is to analyze the effects of fire recovery activities proposed under the Flagtail Fire Recovery Environmental Impact Statement (EIS) on cultural resources. The Flagtail Fire was ignited in July of 2002. It burned approximately 8,200 acres; 7,120 acres are located on the Malheur National Forest, Blue Mountain Ranger District and the remaining 1,080 acres are on private land. The Flagtail Fire Recovery Project area consists of the 7,120 acres, of which 6,180 acres are forested, within the Upper Silvies Watershed. The post-fire landscape consists of 3,150 severely burned acres, 2,400 moderately burned acres, and 460 lightly burned acres. The area is currently characterized by fire-killed ponderosa pine, mixed conifer and interspersed with recent and decant aspen stands.

Cultural resources are fragile and irreplaceable resources that chronicle the history of people utilizing the forested environment. Cultural resources, or Heritage resources, include:

- Historic properties, places which are eligible for inclusion to the National Register of Historic Places (NRHP) by virtue of their historic, archaeological, architectural, engineering, or cultural significance. Buildings, structures, sites, and non-portable objects (e.g., signs, heavy equipment) may be considered historic properties. Traditional Cultural Properties (TCP's), localities that are considered significant in light of the role it plays in a community's historically rooted beliefs, customs, and practices (Parker and King, 1998), are also considered historic properties. Historic properties are subject to the National Historic Preservation Act's Section 106 review process.
- American Indian sacred sites that are located on federal lands. These may or may not be historic properties.
- Cultural uses of the natural environment (e.g., subsistence use of plants or animals), which must be considered under NEPA.

No key issues involving cultural resources have been identified during the scoping efforts for the project.

Regulatory Framework

The legal framework that mandates the Forest to consider the effects of its actions on cultural resources is wide-ranging. In this case, Section 106 of the National Historic Preservation Act (NHPA) of 1966 (amended in 1976, 1980, and 1992) is the foremost legislation that governs the treatment of cultural resources during project planning and implementation. Federal regulations such as 36 CFR 800 (Protection of Historic Properties), 36 CFR 63 (Determination of Eligibility to the National Register of Historic Places), 36 CFR 296 (Protection of Archaeological Resources) and Forest Service Manual 2360 (FSM 2360) clarify and expand upon the NHPA. The Pacific Northwest Region (R6) of the Forest Service, the Advisory Council on Historic Preservation (ACHP), and the Oregon State Historic Preservation Office (SHPO), signed a programmatic agreement (PA) regarding the management of cultural resources on National Forest system lands in 1995. The 1995 PA outlines specific procedures for the identification, evaluation, and protection of cultural resources during activities or projects sponsored by the Forest Service. It also establishes the process that the SHPO utilizes to review Forest Service undertakings for NHPA compliance.

The National Environmental Policy Act (NEPA) of 1969 is also a cultural resource management directive as it calls for agencies to analyze the effects of their actions on sociocultural elements of the environment. Laws such as the National Forest Management Act (NFMA) of 1976, the Archaeological Resources Protection Act (ARPA) of 1979, the Native American Graves Protection and Repatriation Act (NAGPRA) of 1990, Executive Order 13007 (Indian Sacred Sites) Executive Order 13084 (Consultation and Coordination with Indian Tribal Governments), also guide Forest Service decision-making as it relates to Heritage. The American Indian Religious Freedom Act (AIRFA) of 1978 requires that federal agencies consider the impacts of their projects on the free exercise of traditional Indian religions. Executive Order 13175 (EO 13175), Consultation and Coordination with Indian Tribal Governments, November 6, 2000, directs federal agencies to engage in regular and meaningful consultation and collaboration with tribal officials in the development of federal policies that have tribal implications and to strengthen the United States government-to-government relationship with Indian tribes.

The Malheur National Forest Land and Resource Management Plan (USDA Forest Service 1990), the Malheur Forest Inventory Plan (Thomas 1991), and the Programmatic Memorandum of Agreement for Historic Railroad Systems (1986), all have been developed to tier to the previously mentioned laws and corresponding Forest Service manual direction as it sets forth resource management goals, objectives, and standards. Although, the Malheur National Forest was not originally included in the Programmatic Memorandum of Agreement for Historic Railroad Systems (1986), approval was issued Region wide with the 1995 Programmatic Agreement. Forest-wide management standards that are pertinent for this cultural resource effects analysis include:

- Conduct a professionally supervised cultural resource survey on National Forest lands to identify cultural resource properties. Use sound survey strategies and the Malheur National Forest Cultural Resource Inventory Survey Design.
- Evaluate the significance of sites by applying the criteria for eligibility to the National Register of Historic Places.
- Consider the effects of all Forest Service undertakings on cultural resources. Coordinate the formulation and evaluation of alternatives with the State cultural resource plan, the State Historic Preservation Office and State Archaeologist, other State and Federal agencies, and with traditional and religious leaders of Native American Indian groups and tribes with historic ties to the project planning area.

Consultation with Others

Many of the previously described laws, regulations, and directives instruct the Forest Service to consult with American Indian tribes, the state, and other interested parties on cultural resource management issues. The Flagtail Interdisciplinary Team and the Blue Mountain Ranger District invited public comment on fire recovery proposals in the burned area by submitting a project scoping letter to approximately 103 organizations and individuals. Fire recovery proposals were likewise outlined during open house public meetings that were held in John Day, Oregon, in February of 2003. To date, there have been no concerns raised during scoping regarding the effects of fire recovery proposals on cultural resources. In consultation with the three American Indian tribes that have rights or interests in the Flagtail Fire Recovery area, no heritage issues were raised (see Chapter 1, Coordination with Other Governments and Agencies). The heritage inventory has been completed to the standards in Thomas 1991. The results of the inventory are presented in the Heritage Specialist Report and the final inventory report is being completed for submission to SHPO under the terms of the 1995 Programmatic Agreement.

Desired Future Condition

Short Term - The Desired Future Condition (DFC) for the Analysis Area is driven by resource goals, standards, and guidelines described in the Malheur National Forest Land and Resource Management Plan (USDA 1990) and the Inland Native Fish Strategy (USDA 1995).

Long Term - The DFC for the analysis area is to maintain or enhance soil productivity and thus the valuable characteristics of the cultural deposits that lie within. Management should be designed to maintain or improve heritage preservation and associate beneficial uses. For more details relating to goals, standards, and guidelines are available in the Malheur National Forest Land and Resource Management Plan.

Existing Condition

Project Location

County: Grant

Legal description:

T. 16 S., R. 29 E., Sections 1, 12 -14, 22 - 27, 34 - 36 W.M..

T. 16 S., R. 30 E., Sections 6 -8, 17 - 20 W.M..

USGS quadrangle map(s): Logdell

Description: The Flagtail planning area is within National Forest system lands administered by the Blue Mountain Ranger District. The Flagtail Fire Recovery Area is located on the northwest side of Bear Valley at the head of the Silvies River. It is located approximately 13 miles north west of Seneca. Most of the burn is located in Township 16, Range 29 and 30. The project area can be accessed by traveling on County road 63 west from Highway 395 to Forest roads 24 and 2195 directly to the burn area.

Environment

This survey lies in the Blue Mountain Province of northeastern Oregon and southwestern Washington. Within this 100 mile (160 kilometer) wide by 200 mile (320 kilometer) long province exists a complex of mountains, canyons and valleys. The Blue Mountains are comprised of a diverse collection of uplifted sedimentary and igneous rocks from the Paleozoic, Mesozoic, and Tertiary eras. Bedrock in the area comprises Strawberry Volcanics of the Miocene era, which includes basaltic breccia, basaltic andesite, and andesite. This stratum dates from about 20-12 million years ago (mya). This strata overlays older clastic rocks and andesite flows. These clastic rocks and andesite flows are composed of domes, breccia, small intrusive masses, and lesser basaltic to rhyolitic rocks that are interlayered with saprolitic, bedded volcanistic and epiclastic mudstone, claystone, siltstone, conglomerate, and lahar deposits. These rocks have been dated by the potassium-argon method (K/Ar) to 54-37 mya.

The Flagtail Fire occurred within an area known to archaeologists as the Northern Great Basin. The Northern Great Basin is characterized by gentle slopes, with northeast to southwest aligned ridges. The Silvies River is the main feature within the burn; it dissects the northern portion of the burnt area in a northeast direction. Jack Creek runs through the central portion of the burn and flows into the Silvies River several miles down stream. Elevations vary from about 4800 feet to 6100 feet. The Silvies River is fed by numerous creeks and springs, such as Wickiup Creek, Cold Creek, Snow Creek in or near the burn area. Springs in the area include Dipping Vat, 96 Spring, Poison Spring, and several unnamed springs as well.

Based on average values obtained from 44 years of data collection from the Austin Gauging Station, the project area receives an annual average of 20.11 in (51 cm) of precipitation. Most of the precipitation occurs as snow during November to January, with spring rains occurring from March to

May. The largest flows are a result of heavy winter rains accompanied by snow melt on frozen ground.

Sedimentary rocks occur over most of the analysis area (soil types 31 to 37) with extrusive volcanic rocks in the southern part (soil types 41 to 59). The volcanics form a plateau, with an escarpment below. On the sedimentary geology, topography tends to be corrugated hills. The easily weathered sedimentary rocks have contributed to large volumes of colluvial/alluvial fill in wide valley bottoms where meadows have formed (McNeil, 2002).

Table 1: Soil Erodibility and Relevant Properties (McNeil 2002)

Soil Type	Erodibility*	Soil Depth (inches)	Volcanic Ash Thickness (inches)	Slope (%)	Typical Vegetation
3	LM	>24	Variable	<10	Moist & dry meadow
31	LM	12-24	0	<30	Ponderosa
32	M	18-30	6-12	30-70	Mixed conifer
33	MH	12-24	0	30-70	Ponderosa
34	VH	6-12	0	10-70	Juniper & ponderosa
35	VH	4-8	0	30-70	Sagebrush
36	M	24-36	12-18	30-70	Mixed conifer
37	MH	6-12	0	<30	Sagebrush
41	LM	12-30	0	<30	Ponderosa
42	M	12-36	6-12	<30	Mixed conifer
46	MH	8-15	0	<30	Juniper & ponderosa
47	H	4-12	0	<30	Low sagebrush
58	L	24-48	15-24	<30	Mixed conifer

59	M	18-48	12-18	30-70	Mixed conifer
----	---	-------	-------	-------	---------------

* H=High, LM=Low/Moderate, L=Low, M= Moderate, MH=Moderate/High, VH=Very High

The overstory vegetation in the area encompassed by this project includes: ponderosa pine, lodgepole pine, Douglas fir, white fir, aspen, larch, juniper and mountain mahogany. Shrubs in the project area are willow, alder, bitterbrush, currant, and sagebrush. Other shrubs include common and mountain snowberry, grouse huckleberry, serviceberry, and chokecherry. Ground cover consists of mullen, cheatgrass, thistle, yarrow, moss, meadow grasses, sedges and numerous wild flowers.

Remnants of culturally important plant species, such as lomatium spp., onion, balsamroot, camas, yampa and various berries are present in the project area. It is suspected that the distribution of these species has been greatly reduced since the 1860s with the influx of Euroamerican settlers to the area. The present day distribution of fauna in the area is known to include Rocky Mountain elk, mule deer, pronghorn antelope, black bear, bobcats, cougar, jackrabbits, marmots, and gophers, among many others. Game birds consist of California quail, ducks, geese, and grouse.

The majority of the Flagtail Fire burned in a mosaic pattern, which minimized large blocks of severe burn. The Burned Area Emergency Rehabilitation (BAER) team reported 575 acres with high hydrophobic soil conditions. This hydrophobicity is on ash soil with high or moderate severity. The following table depicts 1,720 acres total with high soil severity conditions (McNeil, 2002).

Table 2: Soil Burn Severity (McNeil, 2002)

Total Sub-watershed Acres	Low Severity Acres	Moderate Severity Acres	High Severity Acres	Unburned (Within fire perimeter) Acres	Total Burned Acres	Percentage of Subwatershed Burned
30,270	2,540	2,240	1,720	1,500	6,500	21 (13*)

* Percent of sub-watershed burned with percent of high plus moderate severity in parentheses. (Note: estimates are low resulting from additional burning activity after July 31).

Historic Range of Variability

In 1994, the Unity Ranger District of the WWNF contracted with Rainshadow Research of Pullman, Washington and their collaborator, Applied Paleoscience, to conduct a pilot study of the range of variability in the headwaters of the Northfork John Day River.

Analysis of sediments from McWillis Gulch shows that the forest of the Upper John Day River Basin has undergone significant changes over the last 4000 years. Because of the site's proximity to the headwaters of the Powder, Grande Ronde, and Burnt Rivers, the changes we see in this record will possibly apply to them as well. A subalpine forest occupied the site between approximately 2000 and 400 B.C. The watersheds were interpreted to be clean and productive.

We lack data on the next 700 years, but from 300 A.D. until 1250 A.D. the areas supported a Douglas fir forest that rarely experienced catastrophic fire. Because of the sparse ground cover that accompanied this vegetation type, stream systems would not have been as clean and productive. Big game used the area more during this period than any other. Grand fir became established as the climax association after 1250 A.D., but for the first century of its existence, fluctuating climatic conditions resulted in frequent, severe fires as fuel built up and dried out. This pattern had a negative impact on the watershed, which experienced destructive erosion and certainly sedimentation in downstream areas. Fish productivity would have been harmed. Conditions stabilized after 1350 as the cool climate of the Little Ice Age became dominant. Although climax species occasionally increased and were eliminated quickly by stand clearing fires, a pattern of frequent understory burning, probably by native people, appears to have kept fuel loads down. As a result, fires did not have the devastating effect on stream systems that they had earlier. Runoff remained clean for most of this period (Chatters, 1996).

Cultural Context

The Blue Mountain Ranger District lies on the boundary of two cultural areas, the Columbia Plateau and the Great Basin. Zucker describes this cultural region as follows: "The border between the Great Basin Area and the Plateau Area was even less rigid than other cultural area borders. Peoples from both regions used the area on either side of the boundary. The bands in the Great Basin spoke the Paiute language and shared much culturally and socially. The major food source was from plants including epos, wada, and berries. The population density was very low. Seasonal movement was over a large distance by foot prior to the 1840's. Winter shelter was in a willow-frame house and the social organization was not stratified" (Zucker 1983).

Much of the area occupied by the Cayuse lay within the Blue Mountains and included the drainage systems of the Walla Walla, Umatilla, Upper Grande Ronde, Powder, and Burnt Rivers (Ray 1938:387). Other tribes of the Columbia Plateau include the Nez Perce, Umatilla, Walla-Walla, Yakima, and the Warm Springs. There was no dominant food source but they used camas, kouse,

bitterroot, berries, salmon, buffalo, and other game. The population density was low. Seasonal movement was over a long distance by horse (after 1730). The winter dwelling was a mat longhouse. The social organization was partially stratified by achievement (Zucker 1983).

The Indians of the Columbia Plateau first met non-Indians in 1805 when the Lewis and Clark expedition came through the Columbia Gorge. Trappers came with the Canadian Northwest Company and the Pacific Fur Company after Lewis and Clark and trapped in the area during the first half of the 19th century. The Indians of the Great Basin made their first contact with non-Indians in the 1840's (Zucker 1983).

The Oregon Trail was the route from Independence, Missouri to the Willamette Valley of Oregon used by Euro-American emigrants beginning in 1841. Reportedly over 43,000 persons reached the Willamette Valley using the route between 1841 and 1863. The Oregon Trail passed through Baker Valley but there was no settlement in the area until the discovery of gold in the early 1860's (Haines 1981).

On October 23, 1861, Henry Griffin struck pay dirt on a tributary of the Powder River a few miles west of where Baker is now located. News of the discovery spread quickly and the population soared as miners streamed into eastern Oregon to seek their fortunes. 1700 claims were filed between May and August of 1862 around the town of Auburn (Potter 1977). "Mining and miners provided a market for many services and goods, and merchants, farmers and stock raisers were drawn to the mining area. Settlement of northeast Oregon ...during the 1860's came primarily from the west and the Willamette Valley. Early wagon roads were constructed ...linking settlements and markets around the region" (Hudson et. al 1978:45). A standard gauge railroad was built through Baker City in 1884 as the Oregon Railway and Navigation Company which became part of the Oregon Short Line, a Union Pacific subsidiary, three years later. In 1889 David Eccles formed the Oregon Lumber Company in Baker City. In 1890 he began construction of the Sumpter Valley Railroad which would eventually extend to Prairie City in Grant County. The connection with Union Pacific was like an artery for the narrow gauge Sumpter Valley (Ferrell 1967).

Identified Cultural Resources

Cultural resource identification efforts in the vicinity of the Flagtail planning area have focused on three primary types of resources: prehistoric archaeological sites, historic archaeological sites, and places that support resources of contemporary tribal interest. Cultural resource identification efforts that have been conducted include three previous pedestrian cultural resource inventory surveys, that include; 641-79/029 Fence Springs Development Project CRIS (Grigsby 1991), 641-85/014 Hines Logging Railroad CRIS (Armstrong 1985), and 641-91/131 Upper Silvie CRIS (McNasser 1979).

Literature reviews and consultation with American Indian tribes and other stakeholders that are historically associated with the area were conducted. As a result of the July 2002 Flagtail Wildfire numerous environmental alterations occurred and a resurvey of the high intensity burn

areas was deemed necessary. Surveys were conducted on various days from September through December of 2002. The increase in surface visibility allowed 12 new prehistoric sites, 3 new historic sites, 15 new prehistoric isolates, and 6 new historic isolates (1 of which is within a new prehistoric site) to be located upon resurvey. This most recent cultural resource inventory survey was designed to conform to the standards set in the Malheur National Forest Cultural Resource Inventory Plan (Thomas 1991). Approximately 39% of the Flagtail Fire Recovery Area was inventoried using the Malheur's Inventory Methods. A total of 33% of the high and medium strata was inventoried and examined, with a stratified sample survey strategy that has been approved by the Oregon State Historic Preservation Office (Thomas 1991). Of these 53 cultural properties recorded as sites, a total of 41 sites require protection and should be avoided (with the exception of site H640-0016, this site will suffer very minimal and reversible effects under Alternatives 2, 3, and 5; for mitigation proposals see Chapter 2 of the Flagtail EIS under "Management Requirements, Constraints, and Mitigation Measures" Heritage sub-section) and 12 sites are ineligible for inclusion on the NRHP. In addition, all prehistoric and historic isolates are ineligible.

Most of the previously known sites within heavily burned areas were revisited in 2002 and several were expanded in area, owing mainly to increased ground visibility due to the removal of leaf litter and ground plants by the fire. The Flagtail Fire Recovery Project area is characteristically gentle, with northeast to southwest aligned ridges. The Silvies River is the main feature within the burn; it dissects the northern portion of the burnt area in a northeast direction. Jack Creek runs through the central portion of the burn and empties into the Silvies River several miles downstream. Elevations vary from about 4800 feet to 6100 feet. The Silvies River is fed by numerous creeks and springs in or near the burn, including Wickiup Creek, Cold Creek, and Snow Creek. Springs in the area include Dipping Vat Spring, 96 Spring, and Poison Spring, as well as several unnamed springs. Culturally important plant species, such as biscuitroot, wild onion, balsamroot, camas, yampa, and various berries, are present in the project area. Such territory could be expected to contain at least some prehistoric sites, since it offers warm-season opportunities for hunting, fishing, and the gathering of plants for food and other uses.

Known prehistoric sites in the project area all consist of lithic artifacts such as flaked-stone tools and points, and flakes associated with the manufacture of such tools. Sites are mostly very small, and in general probably represent expedient tool manufacture or reworking, most likely associated with modest seasonal use of the area for hunting and gathering. No large sites with heavy lithic concentrations or stratified deposits of cultural materials, which might suggest heavy and long-term use, are known within the project area.

Historic uses of the project area are reflected, archaeologically, in the form of sites related to past logging operations, stock grazing, and remnants of an old hand-crank era telephone line. Of special concern are 8 spur lines off of the old Hines Logging Railroad, which lie within proposed harvest units (see mitigation measures in Chapter 2 of the EIS). Since several sections of the affected railroad bed meet the criteria for inclusion on the NRHP, mitigation measures are

required. Also, the Bear Valley Work Center is located within the Flagtail project area, where two of the structures on the compound were lost to the fire.

To assess potential fire damage to previously known sites and to discover possible new sites within the Flagtail Fire boundary, a stratified survey was designed. In this design, areas where burning was light to moderate would not be surveyed, while areas of more intense burning, where duff and ground vegetation has been removed by fire, would receive intensive archaeological survey, and previously known sites would be revisited. Because ground visibility was dramatically increased in these heavily burned areas, it was predicted that new sites would be found and areas of existing sites could well be expanded. This intensive survey covered 4,767 acres.

A large portion (4,067 acres) of the lands designated for new archaeological survey within the Flagtail burn area was covered during September thru December of 2002. The Cultural Resource Inventory Heritage Report that incorporates all known cultural properties is being completed for submission to SHPO. The newly discovered sites continue in the character of those previously known in the Flagtail burn area, but demonstrate two things: 1) that within forested areas with significant ground cover, many sites may be passed by, even by trained archaeological surveyors; and 2) use of the area was somewhat more intense than previously known.

PREVIOUS PROJECTS

The following discussion presents cultural resources identified during previous cultural inventory surveys. Included in the listed reports are inventory methods and constraints, results, classification, evaluation, recommendations and conclusions. These previous surveys were evaluated against the current inventory plan and decisions as to whether or not to reenter are based on these evaluations. These cultural resource inventory surveys, include; 641-79/029 Fence Springs Development Project CRIS (McNasser 1979), 641-85/014 Hines Logging Railroad CRIS (Armstrong 1985), and 641-91/131 Upper Silvies (Grigsby 1991).

Appendix A (Heritage Site List) presents the sites within and adjacent (1/4 mile) to the current project area, Site Attributes, and their eligibility.

3. Environmental Consequences

Direct and Indirect Effects

Alternative 1 (No Action)

Implementation of the no action alternative would not directly nor indirectly affect heritage resources since there would be no change to the integrity of eligible or potentially eligible heritage resources. Failure to reduce the accumulated fuel load would increase the potential for a second phase of wildfire loss, thereby increasing the potential for adverse effects on cultural resources, particularly trails, buildings, structures, combustible sites and lithic materials. Hazard tree felling would occur but removal would not be allowed, downed trees would be left

on site. Mitigations including directional felling away from historic sites and toward the site boundary would be imposed. (Chapter 2, Management Requirements, Constraints, and Mitigation Measures in the EIS).

Recent research suggests that the scientific value of obsidian dominated lithic scatters located at or near the surface of the ground is often degraded by surface temperatures generated during high and moderate severity wildfires (Trembour 1990).

Fire severity: Fire severity, loosely, is a product of fire intensity and residence time. Fire severity is generally considered to be low, moderate, or high. A *light severity* burn is one that leaves the soil covered with partially charred organic material. A *moderate-severity* burn results from a burn in which all of the organic material is burned away from the surface of the soil; any remaining fuel is deeply charred. A *high-severity* burn results in all of the organic material being removed from the soil surface; organic material below the surface is consumed or charred (DeBano et al 1998).

Field and laboratory studies indicate that damage to obsidian dominated surface sites correlates directly to fire temperature and fire residence time in wildfire situations (Skinner et al. 1997; Linderman 1992). A study conducted at the Dome Fire on the Santa Fe National Forest in New Mexico, found an inverse relationship between the ability of obsidian artifacts to provide chronologic data, and the degree of burning the artifacts experienced during the wildfire (Steffen 2002). The Dome Fire study found that archaeological specimens with measurable obsidian hydration bands were present in higher frequencies (87% retained OH bands) within assemblages that were not burned, than within assemblages that were burned (27% retained OH bands).

In addition, without reforestation or watershed improvement, heritage sites could be at risk from erosion and flooding. Finally, two popular forest activities, those of mushroom harvesting and horn hunting (antler gathering) could have an indirect effect in the wake of the fire. There is the potential that with many people searching the exposed forest floor a small percentage of harvesters will prove unscrupulous and will illegally collect cultural artifacts.

Alternatives 2, 3, 4 and 5:

There would be no direct negative affects to cultural resources for Alternatives 2, 3, 4 and 5. The Malheur N.F. will insure that mitigation measures identified in the EIS (Chapter 2, Management Requirements, Constraints, and Mitigation Measures), as taken from the PMOA are carried out for the management of affected historic railroad systems. Avoidance measures of heritage sites that are deemed eligible or potentially eligible will be implemented as per Stip. III.B.2(a-d) of the 1995 Programmatic Agreement (see Chapter 2, Management Requirements, Constraints, and Mitigation Measures in the EIS). Dispersed hazard tree cutting (all action alternatives) and removal (Alternatives 2, 3, and 5) will occur. If this activity occurs within heritage site boundaries mitigations would be imposed (Chapter 2, Management Requirements, Constraints, and Mitigation Measures). With prescribed mitigation, hazard tree removal in historic or archeological sites would have limited ground disturbance and no impact to historic and prehistoric sites is expected. Responsible management that implements prescribed

mitigation measures has proved to be highly successful at protecting eligible heritage sites from negative impacts. It is recognized that even the most intensive field surveys may not locate all heritage sites. The portions of this project that would be implemented through a timber sale or restoration contracts under any action alternative would include the #C6.24 clause which enables the Forest Service to modify or cancel any service contract to protect heritage resources, regardless of when they are identified. Reducing motorized access by decommissioning open roads could benefit cultural resources through limiting vehicle access to eligible sites, thereby reducing the opportunities for looting or vandalism.

Alternatives 2, 3, 4, and 5 reduce future fuel loadings to varying degrees, which reduces the severity and resistance to control future fires (see Fire and Fuels section of Chapter 3 of the Flagtail Fire Recovery EIS for a comparison of magnitude). Therefore, these alternatives decrease the potential for a second phase of wildfire loss in the project area. All action alternatives have the same amount of reforestation acreage proposed; thus, all action alternatives equally decrease the risk of erosion and flooding.

There exists the potential for negative indirect effects to cultural resources for Alternatives 2, 3, 4 and 5. Although the general mitigation measure to protect heritage sites is avoidance of those sites, this very avoidance could lead to an indirect effect for burned over sites, in that the surfaces of those avoided sites will remain exposed to the elements longer than the surrounding forest because there will be no reseeded. Rainfall will also impact these bare sites leading for the potential of runoff displacing artifacts, even those slightly below surface.

Alternative 2 has higher fuel reduction treatment acreage. Therefore, this alternative decreases the potential for a second phase of wildfire loss in the project area. All action alternatives have the same amount of reforestation acreage proposed thus; all action alternatives equally decrease the risk of erosion and flooding.

Cumulative Effects

When an artifact is deposited on the ground it is set into motion by a number of natural processes with the help of gravity. Weathering facilitates natural processes such as pedogenesis, (soil development), pedoturbation, (soil disturbance), physiogenic (mechanical processes such as ice and water) and biogenic (biological processes such as plant and animal disturbance) processes. All of these processes contribute to the burial, transformation and dispersion of archaeosediments. The displacement of cultural materials by natural processes, combined with intervening geologic events caused by wildfire, has the potential to mask the distributions of artifacts and/or buried features.

In Alternative 1, hazard tree felling is reasonably foreseeable but removal would not occur; downed trees would be left on site. Mitigation would be imposed that would protect sites (see **Chapter 2, Management Requirements, Constraints, and Mitigation Measures in the EIS**).

As a result of the proposed activities a lower probability of stand replacing wildfires is expected. While many types of cultural resources can survive low-severity fires with little or no damage, high-severity burns destroy or damage a wide range of heritage sites.

Prior to establishment of the Forest Service Heritage Resource Program, past effects of timber harvest, fire suppression, and trail, road, and recreational facility development occurred with little analysis of cultural resource impacts. Adverse effects may have occurred from livestock grazing, irrigation development, and dispersed recreation. Little effort was made to deter private collection of historic or prehistoric artifacts on NFS lands, and losses of cultural resources were extensive in certain locations. The adoption and enforcement of federal cultural resource protection legislation and regulations over the past 30 years has reduced the rate of cultural resource deterioration.

Ongoing dispersed hazard tree removal will occur. If this activity occurs within heritage site boundaries mitigations will be imposed. Mushroom harvesting and horn hunting (antler gathering) as identified in Appendix J of the EIS in the wake of the fires may also adversely affect cultural resources. There is the potential that with many people searching the exposed forest floor; unscrupulous harvesters will illegally collect cultural artifacts.

It is unlikely that there would be cumulative effects to identified heritage resources in the post Flagtail Fire Recovery Project area from any of the proposed activities identified in Appendix J, of the Flagtail Fire Recovery EIS. However, if any such effects are identified, re-initiation of the SHPO consultation process will occur, and appropriate avoidance or new mitigating measures would be developed.

In the consideration of other past, present, and future activities in the cumulative effects analysis (please refer to Appendix J in the Flagtail Fire Recovery EIS), it is apparent that Alt. 2, 3, 4, and 5 adequately consider past, present and future actions.

Consistency with Forest Plan

Heritage and Tribal interests are regulated by federal laws that direct and guide the Forest Service in identifying, evaluating and protecting heritage resources. All of the alternatives would comply with federal laws. The Malheur National Forest. Plan tiers to these laws, therefore the proposed action alternatives will meet Forest Plan standards. Completion of the Heritage inventory under the terms of the 1995 PMOA and also providing the interdisciplinary team with appropriate input as per NEPA, all relevant laws and regulations have been met. The Programmatic Memorandum of Agreement (PMOA) for the Management of Historic Railroad Systems for the Wallowa-Whitman National Forest will be utilized (1986). The Malheur N.F. was provided authority to utilize this PMOA in the 1995 Programmatic Agreement with SHPO.

Irreversible and Irretrievable Commitments

There are no irreversible and irretrievable commitments of resources that may result from the alternatives with respect to cultural resources, except for the potential that subsurface historic artifacts might be disturbed during the placing of skid roads under alternatives 2, 3, and 5. Appropriate mitigation steps are in place (see Management Requirements, Constraints, and Mitigation Measures in Chapter 2 of the EIS).

Mitigations

The Programmatic Memorandum of Agreement (PMOA) for the Management of Historic Railroad Systems for the Wallowa-Whitman National Forest will be utilized. The Malheur N.F. was provided authority to utilize this PMOA in the 1995 Programmatic Agreement with SHPO. The cultural resource staff has completed a site form addendum on the historic railroad system that is within the Flagtail Planning area. This site form includes mapping, photography, sketches and drawings, and analysis. There is a total of approximately 1336m / 4,384 feet or 0.83 miles of historic railroad grades and spurs within and adjacent to proposed tractor harvest units. The following table depicts results from the railroad grade assessments, all affected railroad grades were evaluated in terms of grade classification, grade condition, feature condition, interpretation condition and assigned values accordingly. The end result is a complete assessment of affected segments to be utilized for management decision making. (For elaboration on Logging Systems, please refer to the Flagtail Recovery EIS).

Table 3: Identification of Hines Railroad Spurs in Relationship to Cut Units and Method of Logging

Spur	Grade	Perm v Temp	Cut Units	Type of Logging	Meters	Comment
------	-------	-------------	-----------	-----------------	--------	---------

B18A	C	Temporary	130	Tractor Unit	25m	
B18B	C	Temporary	150	Tractor Unit	305m	
C42	B	Temporary	8	Skyline Unit		
			15	Helicopter Unit		
			17	Skyline Unit		
C45A	B	Temporary	4	Tractor Unit	24m	skims boundary
			34		208m	
			36	Helicopter Unit		
C45B	B	Temporary	None			
C46	B and C	Temporary	90	Tractor Unit	303m	
			88	Helicopter Unit		
C47	B	Temporary	90	Tractor Unit	471m	
		Temporary	87	Helicopter Unit		
		Temporary	85	Skyline Unit		
B17	B	Temporary	None			

- Meter quantification is only addressed for Tractor Units

There are no mainline grades affected with the Flagtail harvest activities. The spur lines that may be affected are part of an extensive network. Management emphasis will make certain that skid trail crossings over these spurs adhere to the following criteria:

1. Railroad spurs in the Grade Condition C do not warrant protection or preservation.
2. Skid trail crossings should be made as far as possible from points where the grade could be viewed by recreationists.
3. Crossings should be made at right angles to the longitudinal axis of the grade, rather than diagonally. Right angle crossings decrease the area of impact.
4. Skidding across the grade should be restricted to designated skid trails located at previously disrupted segments and crossings. If a skid trail crosses a grade in a previously undisturbed segment, the grade must be repaired to its pre-harvest configuration. The Sale Administrator will be responsible for photographic and GPS documentation of crossings to ensure mitigation measures reach pre-harvest configuration. In addition, if any such skid road(s) are to be placed across a railroad grade, a qualified Forest Service employee should be present during the initial ground disturbing action to monitor for the possibility that subsurface historic artifacts may be disturbed, if any such artifacts should be present ground disturbing work must stop and the district archaeologist will be consulted.
5. If features such as trestles, water tank towers, wyes, switches, major cuts and fills, and the remnants of logging camps, the grade should be left intact for at least 300 feet on either side of the feature.

Heritage

Management Requirement/Mitigation Measure	Objective	Responsible Person
Alternatives 2, 3, 4, and 5		
All activities involved with the implementation of any of the proposed actions will avoid all heritage sites, with the exceptions of hazard tree removal and the Hines Railroad grade (see mitigation measures below).	Limit impacts to historic and prehistoric sites.	Sale Administrator District Archaeologist
If hazard trees are located in archeological or historic sites (as displayed on the Timber Sale map provided to the Sale administrator), these trees must be directionally felled with a chainsaw and removed with a boom-mounted log loader or grappling equipment; no winching, skidding, or other cable-based systems may be used for removal, and no heavy equipment of any type is permitted off existing roads or landings in these areas. Slash disposal will occur outside of heritage site boundaries.	Limit ground disturbance and impact to historic and prehistoric sites	Sale Administrator
If an unknown archeological or historic site is found, stop ground-disturbing activities, until the District Archeologist assesses the situation and recommends appropriate action.	Limit risks to heritage resources.	Sale Administrator
<p>Skid trail crossings over spurs in Units 4, 8, 15, 17, 34, 36, 85, 87, 88, 90 will adhere to the following criteria:</p> <ul style="list-style-type: none"> -Skid trail crossings should be made as far as possible from points where the grade could be viewed by recreationists. -Crossings should be made at right angles to the longitudinal axis of the grade, rather than diagonally. Right angle crossings decrease the area of impact. -Skidding across the grade should be restricted to designated skid trails located at previously disrupted segments and crossings. If a skid trail crosses a grade in a previously undisturbed segment, the grade must be repaired to its pre-harvest configuration. The Sale Administrator will be responsible for photographic and GPS documentation of crossings to ensure mitigation measures reach pre-harvest configuration. In addition, if any such skid road(s) are to be placed across a railroad grade, a qualified Forest Service employee should be present during the initial ground disturbing action to monitor for the possibility that subsurface historic artifacts may be disturbed, if any such artifacts should be present ground disturbing work must stop and the district archaeologist will be consulted. -If features such as trestles, water tank towers, wyes, switches, major cuts and fills, and the remnants of logging camps, the grade should be left intact for at least 300 feet on either side of the feature. <p>These mitigation measures, with the exception of the monitoring provision, were derived from the Programmatic Memorandum of Agreement (PMOA) for the Management of Historic Railroad Systems for the Wallowa-Whitman National Forest. The Malheur N.F. was provided authority to utilize this PMOA in the 1995 Programmatic Agreement with SHPO.</p>	Reduce or mitigate damage to visual appearance of sites that visually illustrate an association with important episodes of history.	District Archaeologist Sale Administrator

R
e
f

References Cited

Armstrong, Tom 1985. *Hines Logging Railroad CRIS, Report #641-85/014*. Report on file at the Malheur National Forest Supervisor's Office, John Day, Oregon.

Chatters, J.C., 1996. *McWillis Gulch: An Investigation of the Historic Range of Variability in Vegetation, Fire and Sedimentation at the Crest of the Greenhorn Range, Northeastern Oregon*. U.S.D.A. Forest Service. Unity Ranger District Contracted Publication.

DeBano, L.F.; Neary, D.G.; Folliott, P.F. 1998, *Fire's Effects on Ecosystems*. John Wiley & Sons, New York.

Ferrell, Malory Hope. 1967. *Rails, Sagebrush and Pine*. Golden West Books. San Marino, California.

Grigsby, Thomas L. 1991. The Upper Silvies Timber Sale Cultural Resource Inventory Survey. Report #641-91/131. Report on file at the Malheur National Forest Supervisor's Office, John Day, Oregon.

Haines, Aubrey L. 1981. *Historic Sites Along the Oregon Trail*. The Patrice Press. Gerald, Missouri

Hudson, Lorelea, Gary C. Ayres, George F. Gauzza, and Joseph Randolph. 1978. *Cultural Resource Overview of the Malheur, Umatilla, and Wallowa-Whitman National Forest, Vol. I*. Cultural Resource Consultants, Inc. Sandpoint, Idaho.

King, Thomas F., 1998, *Cultural Resource Laws and Practice, An Introductory Guide*. Alta Mira Press.

Linderman, Carole A., 1992, *The Effects of Fire on Obsidian Artifacts: A Problem in Hydration Dating in a Woodland Environment*. Unpublished Senior Honors Paper, Department of Anthropology, University of Oregon, Eugene, Oregon.

Malheur National Forest, 1990. *Land and Resource Management Plan*. USDA Forest Service, Pacific Northwest Region, Malheur National Forest, John Day, Oregon.

McNassar, Maureen 1979. The Fence Springs Development Project Cultural Resource Inventory Survey. Report #641-79/029. Report on file at the Malheur National Forest Supervisor's Office, John Day, Oregon.

Ray, Verne F. 1938. Tribal Distribution in Oregon. In *American Anthropologist* Vol. 40, 1938, pp. 384-415.

Parker, Patricia L. and Thomas F. King, 1998, *Guidelines for Evaluating and Documenting Traditional Cultural Properties*. National Register Bulletin 38. National Park Service, National Register of Historic Places, Washington D.C.

Potter, Miles F. 1977. *Oregon's Golden Years*. The Claxton Printers, Ltd. Caldwell, Idaho.

Skinner, Craig E., Jennifer J. Thatcher, and M. Kathleen Davis, 1997, *X-Ray Fluorescence Analysis and Obsidian Hydration Rim Measurement of Artifact Obsidian from 35-DS-193 and 35-DS-201, Surveyor Fire Rehabilitation Project, Deschutes National Forest, Oregon*. Report 1996-33 prepared for the Deschutes National Forest, Bend, Oregon, by Northwest Research Obsidian Studies Laboratory, Corvallis, Oregon.

Steffen, Anastasia, 2002, The Dome Fire Pilot Project: Extreme Obsidian Fire Effects in the Jemez Mountains. In *The Effect of Fire and Heat on Obsidian*. Edited by J. Loyd, T. Origer, and D. Fredrickson.

Thomas, Suzanne, 1991, *Malheur National Forest Cultural Resource Inventory Plan*. USDA, Malheur National Forest, John Day, Oregon.

Trembour, Fred N., 1990, Appendix F: A Hydration Study of Obsidian Artifacts, Burnt vs. Unburnt by the La Mesa Forest Fire. In *The 1977 La Mesa Fire Study: Investigation of Fire and Fire Suppression Impact on Cultural Resources in Bandelier National Monument*, by Diane Traylor, Lyndi Hubbell, Nancy Wood, and Barbara Fiedler, pp. 174-180. Southwest Cultural Resources Center Professional Papers No. 28, National Park Service, Santa Fe, New Mexico.

USDA Forest Service. 2002. Malheur National Forest BAER team specialist report: soils, McNeil. Malheur National Forest, John Day, OR.

USDA Forest Service, 1995. Pacific Northwest Region 6, the Advisory Council on Historic Preservation, and the Oregon State Historic Preservation Officer regarding Cultural Resource Management on National Forests in the State of Oregon.

USDA Forest Service, 1986. Wallowa-Whitman National Forest, Programmatic Memorandum of Agreement for the Management of Historic Railroad Systems on the Wallowa-Whitman National Forest.

Wilde, J.D., 1985, *Prehistoric Settlements in the Northern Great Basin: Excavations and Collections Analysis in the Steens Mountain Area, Southeastern Oregon*. Ph.D Dissertation, Department of Anthropology, University of Oregon.

Zucker, Jeff, Kay Hummel, Bob Hogfloss. 1983 *Oregon Indians: Culture, History, and Current Affairs*. Western Imprints, The Press of the Oregon Historical Society. Oregon.

Appendix A: Heritage Site List

SITE NUMBER	SITE ATTRIBUTES	ELIGIBILITY
H640- 0016	RR Grade	Eligible
A641-0016	Lithic Scatter	Undetermined
H641-0049	Stock Driveway	Ineligible
A641-0054	Lithic Scatter	Eligible
H641-0055	Historic debris scatter	Ineligible
H641-0056	Historic agricultural debris,	Undetermined
AH641-0057	Lithic Scatter/Cans/Rock Carving	Eligible
A641-0058	Lithic Scatter	Ineligible
H641-0060	Split rail fence	Ineligible
H641-0061	Split rail fence	Ineligible
H641-0062	Telephone Line	Ineligible
A641-0064	Lithic Scatter	Eligible
A641-0065	Lithic Scatter	Eligible
A641-0066	Lithic Scatter	Ineligible
H641-0261	Can dump	Ineligible
AH641-0428	Industrial debris Tie Mill	Ineligible
H641-0432	RR Logging Camp "Toonerville"	Eligible
A641-0466	Lithic Scatter	Eligible
A641-0470	Lithic Scatter	Eligible
A641-0471	Lithic Scatter	Eligible
A641-0472	Lithic scatter	Eligible
A641-0488	Telephone line	Ineligible
A641-0675	Lithic Scatter	Eligible
A641-1143	Lithic Scatter	Eligible
A641-1144	Lithic Scatter	Eligible
A641-1145	Lithic Scatter	Eligible
A641-1146	Lithic Scatter	Eligible
A641-1147	Lithic Scatter	Eligible
A641-1148	Lithic Scatter	Eligible
A641-1149	Lithic Scatter	Eligible
AH641-1150	Lithic Scatter	Eligible
A641-1152	Lithic Scatter	Ineligible
A641-1154	Lithic Scatter	Eligible
A641-1156	Lithic Scatter	Ineligible
A641-1509	Lithic Scatter	Eligible
A641-1510	Lithic Scatter	Undetermined
A641-1625	Lithic Scatter	Undetermined
A641-1626	Lithic Scatter	Undetermined
A641-1659	Lithic Scatter	Undetermined

New Sites

Newly Recorded Sites

H641-1937	Bear Valley Work Center	Eligible
A641-1938	Lithic scatter, retooling	Eligible
A641-1943	Lithic scatter, retooling	Eligible
A641-1944	Lithic scatter, retooling	Eligible
A641-1947	Lithic scatter with flaked tools	Eligible
A641-1948	Lithic scatter, with flaked tools	Eligible
A641-1949	Lithic Scatter	Undetermined
H641-1956	Trash Dump, hunter's camp	Undetermined
H641-1957	Trash dump	Undetermined
A641-1958	Lithic scatter, with flaked tools,	Undetermined
A641-1960	Lithic scatter, retooling	Eligible
A641-1961	Lithic scatter, retooling	Undetermined
AIH641-1963	Lithic scatter, retooling, bottle	Eligible
A641-1967	Lithic scatter, with flaked tool	Eligible
A641-1969	Lithic scatter with flaked tool	Eligible

New Isolates

IA641-1932	1 Elko Corner Notch & 1 Northern Side Notch Projectile Points
IA641-1933	Stem Point
IH641-1934	PP tip
IH641-1935	Canyon City Coke bottle
IH641-1936	Pluto Bottle
IA641-1939	Elko Corner Notch PP
IA641-1940	Possible Stemmed
IA641-1941	Elko Corner Notch PP
IA641-1942	Elko Corner Notch PP
IA641-1945	Elko Corner Notch PP
IA641-1950	Lithic scatter, CCS and obs.
IA641-1951	ECN PP
IA641-1953	Lithic scatter
IA641-1954	Lithic scatter
IH641-1955	Can dump
IA641-1959	Lithic scatter
IA641-1962	Lithic scatter
IA641-1964	Lithic scatter
IA641-1965	Lithic scatter
IH641-1966	Stock Driveway Sign