

2016 CAYUSE MOUNTAIN FIRE

BURNED AREA EMERGENCY RESPONSE PLAN

SPOKANE TRIBE

BUREAU OF INDIAN AFFAIRS



View of Cayuse Mountain

WELLPINIT, WA
SEPTEMBER 2016
INTERAGENCY BAER TEAM



BURNED AREA EMERGENCY RESPONSE PLAN
2016 CAYUSE MOUNTAIN FIRE

AGENCY/UNIT: Bureau of Indian Affairs
Spokane Indian Tribe

LOCATION: Wellpinit, Washington

DATE: September 12, 2016

PREPARED BY: Interagency Burned Area Emergency
Response Team (D. Martinez)



View from the Peaks Property

Submitted By: _____
Darryl Martinez, BAER Team Leader, BIA NIFC – Albuquerque, NM

**BURNED AREA EMERGENCY RESPONSE PLAN
2016 CAYUSE MOUNTAIN FIRE**

REVIEW AND APPROVAL -- BUREAU OF INDIAN AFFAIRS

I. EMERGENCY STABLIZATION PLAN CONCURRENCE

- Concur**
- Concur with Revision**
- Disapproved**

Explanation for Revision or Disapproval:

Dale Sebastian, Acting Superintendent, Spokane Agency, BIA

Date

II. EMERGENCY STABLIZATION PLAN CONCURRENCE

- Concur**
- Concur with**
- Revision Disapproved**

Explanation for Revision or Disapproval:

Stanley Speaks, Regional Director, Northwest Region, BIA

Date

III. EMERGENCY STABILIZATION PLAN CONCURRENCE

- Approved**
- Approved with Revision**
- Disapproved**

Explanation for Revision or Disapproval:

Aaron Baldwin, Director, Branch of Wildland Fire Management, BIA

Date

EXECUTIVE SUMMARY

This Burned Area Emergency Response (BAER) plan addresses emergency stabilization and burned area rehabilitation of post-fire effects as a result of the Cayuse Mountain Fire. This plan has been prepared in accordance with the *Department of the Interior, Departmental Manual, Part 620: Wildland Fire Management, Chapter 3: Burned Area Emergency Stabilization and Rehabilitation* (January 19, 2001) and the *Interagency Burned Area Emergency Stabilization Guidebook* (June, 2006).

The 18,086 acre fire occurred on Spokane Indian Reservation trust lands within the jurisdiction of the Bureau of Indian Affairs-Spokane Agency. The fire also burned a relatively small acreage of private fee lands (136 acres) and lands administered by the Bureau of Reclamation (183 acres.) This plan provides emergency stabilization and burned area rehabilitation recommendations for lands on the Spokane Indian Reservation potentially impacted by the Cayuse Mountain Fire.

The primary objectives of the Cayuse Mountain Fire Burned Area Emergency Response Plan are to:

- promptly mitigate the unacceptable effects of the fire on lands within and adjacent to the burned area in accordance with management policy guidelines and all relevant federal and tribal regulations;
- repair or improve lands damaged directly by wildland fire and unlikely to recover naturally by emulating historic or pre-fire ecosystem structure, function, diversity, and dynamics according to approved land management plans;
- restore or promote healthy, stable ecosystems in the burned area within the Spokane Indian Reservation; and
- provide training to local resource specialists in the process of burned area emergency response.

The Interagency BAER team conducted an analysis of fire effects using aerial and ground reconnaissance methods across trust lands impacted by the fire. Resource assessments produced by the BAER team can be found in Appendix I and treatments identified in the assessments can be located within Part F, Specifications. A summary of treatment costs is located within Part E. A signature page for review and approval is located in Part I. Appendix II contains the National Environmental Policy Act (NEPA) compliance summary for all recommended treatments. Appendix III contains maps while Appendix IV contains photo documentation of fire effects. Appendix V contains supporting documentation.

Fire Background

The following information is summarized from the Cayuse Mountain Fire Narrative prepared by the Type II Northwest Interagency Incident Management Team (NWIIMT) 9.

The Cayuse Mountain Fire started 8 miles southwest of Wellpinit, Washington on August 21, 2016 when high winds from a strong dry cold front passage caused the Hart Road Fire to jump the Spokane River. The fire spread very rapidly threatening numerous structures and triggering level 2 and 3 evacuations. By evening the fire had spread to approximately 12,700 acres in size and a Type II incident management team was ordered.

The NWIIMT 9 in-briefed with the Tribe and Agency on August 23 and assumed control of the incident on August 24. At this time local resources had managed to complete fireline on 80 percent of the perimeter. Priority control objectives were to hold and mop-up existing control lines, secure unlined fire edge on the northwest and eastern edges, and minimize any further fire spread that could threaten further loss of structures.

The Spokane Agency and Tribe provided critical resources to the incident including engines, dozers, water tenders, and line leadership. NWIIMT 9 attributed much of their success to the contributions of these local firefighting resources. Local resource advisors also worked with the incident team to minimize

suppression-related damage to critical cultural and natural resources and promptly undertake suppression rehabilitation actions. Resources on the incident reach a peak level on August 27 with 488 personnel assigned.

Air operations for both the Cayuse Mountain and Hart Road Fires were under the direction of the NWIIMT 7 Air Group. The respective Air Operations Branch Directors coordinated daily to ensure the needs of each fire were met. In addition to lead planes and air tankers used during initial attack, peak aircraft utilization for the Cayuse Mountain and Hart Road Fires combined consisted of air attack and 2 Type 1, 3 Type 2 and 2 Type 3 helicopters.

Besides the clear threats the fire posed to residents and infrastructure, a major concern was the Sherwood Uranium Mine located at the northwest corner of the fire. Safe working specifications for fire personnel were developed through consultation with the Washington State Department of Health. Other hazards included livestock, rattlesnakes and miles of downed power lines.

By August 30 dozer lines had been constructed on 90 percent of the fire perimeter and hand lines on the remaining 10 percent. The entire fire perimeter had been mopped up to an average of 200 feet and interior unburned areas that posed a potential threat to structures had been secured. All rehabilitation of interior dozer lines had also been completed. Transition to the Type III organization took place on August 31.

Incident Objectives

The following fire management objectives were identified by the Spokane Tribe and BIA Spokane Agency:

- provide for safety of firefighters by utilizing risk management processes assessing the best means to meet operational objectives;
- provide for safety of the public by utilizing PACE model and trigger points allowing notification of the public timely, coordinate with implementing agencies on closures and evacuations;
- general strategy is to minimize acres burned—efficiently, and minimize impacts to natural resources, where indirect strategies are likely to be efficient, coordinate with agency administrators and affected landowners in advance;
- keep the communities and interested parties informed of fire conditions present and future and to develop understanding for management actions, being cognizant of strengthening relationships; and
- coordinate with emergency managers and cooperators to develop strategies for responding to affected landowners and the communities as a result of the fire.

Management Direction

Management direction relevant to Emergency Stabilization and Burned Area Rehabilitation is documented in the *Spokane Indian Reservation Fire Management Plan, 2005*; *DOI Departmental Manual, Part 620: Wildland Fire Management, Chapter 3: Burned Area Emergency Stabilization and Rehabilitation (January 19, 2001)*; and *Interagency Burned Area Emergency Stabilization Guidebook (June, 2006)*. The conditions triggering BAER plan preparation and implementation include:

- threats to life and property;
- loss of soil or on-site productivity;
- loss of water control and deterioration or water quality; and
- threats to critical resources, including irreversible loss of native vegetation, threats to listed species, or threats to Federal Register properties and/or cultural resources.

The BAER Team, tasked with evaluation of emergency stabilization and rehabilitation needs, developed this plan to address the following issues:

- Risk of flooding or debris flow impacts to homes, roads and other sites

- Public safety
- Water quality
- Threatened and Endangered species
- Potential invasive species spread
- Wildlife habitat
- Commercial timber loss and reforestation needs
- Soil erosion
- Cultural and historic resources
- Continuous forest inventory plot reestablishment
- Tree hazards
- Livestock management

Cultural Resources

There is a moderate diversity of archaeological site types that are known, or expected to exist across the landscape affected by the fire or that have the potential to be affected by post-fire effects. Site types include habitation sites, cemeteries and individual burials, storage pits, stacked rock features, rock art, culturally modified trees, and historic residential structures. Other cultural resources include traditional resource gathering locations and traditional cultural places. A variety of site types were visited during the assessment. Four pre-contact occupation areas were assessed along the river. Aside from the cemeteries, two burial locations along the river were also assessed. A pictograph site was assessed as were two talus storage pit locations. Lastly, an assessment was done at the location of an historic residence.

With the exception of the fence surrounding one cemetery, there was no direct fire damage to any cultural resource site. Culturally important plants were damaged by the fire, however, due to the relatively low intensity of the burn and regenerative capabilities of the species, fire impacts are expected to be short-term. One site was determined to be at-risk of damage from potential debris flows, however, no feasible protection measures were identified. No other significant post-fire damage to cultural sites is anticipated. Prescribed treatments include rebuilding the damaged cemetery fence and completing necessary cultural resource compliance activities associated with recommended reforestation treatments.

Forest and Vegetation Resources

The Forest and Vegetation Assessment addresses fire impacts to commercial timberlands, forest reserves, woodlands and grasslands. For all vegetation types combined just under 60 percent of the fire area experienced high or very high mortality (levels greater than 50 percent), however, 22 percent of this area consists of grasslands and shrublands which are expected to rapidly recover.

For forested lands alone just under 60 percent experienced high or very high mortality. Timber growth and yield will be substantially reduced in stands that experienced moderate or high mortality. These lands are not expected to recover rapidly without reforestation treatments. Blue Creek-Sherwood, Cayuse Mountain and South Breaks Forest Reserve areas experienced substantial forest mortality. South Breaks was impacted the highest with 74% of the Reserve experiencing high or very high mortality.

Fire-weakened trees pose a threat to anyone traveling through the fire area, consequently tree hazard assessment and potential mitigation is recommended for 31 miles of primary system roads. It is estimated 62 of the existing 92 continuous forest inventory (CFI) plots in the fire area may have been damaged or destroyed by fire. The plot stakes, reference trees and tree tags should be reestablished on these plots. Additionally, the burn area is susceptible to invasion by non-native weeds, most notably knapweeds and thistles.) Annual weed assessments are recommended for all roads and dozer lines, to be followed by chemical and biological control treatments if determined necessary.

Wildlife and Range Resources

Analysis of GIS databases, species occurrence maps, and consultation with species experts indicates that no Federally Listed Threatened and Endangered species occur in the vicinity of the Cayuse Mountain Fire. Due to lack of occurrence and potential habitat, there will be **no effect** to any federal candidate, threatened or endangered species with the potential to occur on the reservation as provided by the US Fish and Wildlife Service.

There are no stabilization activities proposed for the sole benefit of wildlife. All of the proposed emergency stabilization activities in the vicinity of Cayuse Mountain Fire will have an indirect beneficial effect on wildlife. There is one fence within the boundary of the fire that was burned and is managed for the protection of wildlife habitat. This fence will need minor repairs to replace wooden corner braces and will be funded and repaired by the Wildlife Mitigation Program.

Fisheries

One federally listed fish species, the bull trout (threatened) has been documented to occur in the Spokane arm of Lake Roosevelt within the area of the Cayuse Mountain Fire. Critical habitat for bull trout has not been designated in the Spokane River or Lake Roosevelt. The Spokane Arm of Lake Roosevelt supports a popular recreational fishery. Recreational fishing also occurs at Benjamin and Mathew Lakes on the Spokane Indian Reservation.

Hydrologic modeling results show that the Cayuse Mountain and Prospect watersheds have the potential for sediment and ash delivery that could impact water quality and nutrient levels in Lake Roosevelt. Following initial storm events these impacts are expected to decrease significantly. Given the size of these watersheds relative to the volume of the reservoir and the fact fish will be able to largely avoid turbid areas, no significant impacts to fisheries are expected to occur. Water quality monitoring should be continued or even increased, particularly following storm events.

The areas near and upslope of Benjamin and Mathew Lakes exhibit low topographic relief, low soil burn severity, and low fire intensity. Both lakes have significant riparian areas that are intact which will filter any potential sediment inputs. No anticipated effects to water quality for either lake are expected to occur.

Public Safety Infrastructure

Potential areas of concern were identified through discussions with the respective Incident Management Teams, resource advisors, tribal and agency officials, and local residents. Focused ground survey was then conducted on tribal lands within the fire area by BAER team members and Tribal representatives. Roads that were surveyed include the Elijah, Sherwood Mine, Wynecoop-Cayuse Mountain, and Wellpinit-Little Falls roads. Potential infrastructure needs were identified, mapped, photographed and recorded. These include: repairing burned roadside guard rails on Elijah Road, Sherwood Mine Road, and the Wynecoop-Cayuse Mountain Road; replacing damaged safety and directional signs on the Sherwood Mine Road, Elijah Road and the Wellpinit-Little Falls Highway; and replacing a burned outhouse at the Jackson Cove Recreation Area.

Watershed Resources

Soil testing in the field was conducted in areas of high, moderate, and low soil burn severity. Unburned soils in comparable vegetation, elevation, and aspects were also tested to calibrate soil tests conducted in burned soils. The following observations were made regarding post-fire watershed conditions: the majority of the lands burned in the Low and Moderate soil burn severity classes; very little fire-induced hydrophobicity (water repellency) was found throughout the fire; surface roughness was observed in many areas, which will help catch and detain rainfall which will aid infiltration and mitigate erosion potential increase in runoff potential; on steeper burned slopes, loss of ground vegetation and litter will allow perched sediments and surface debris to more easily dry ravel; the primary watershed responses from the effects of the fires are expected to include an initial flush of ash and sediment with normal precipitation; flooding and debris flows may be initiated by higher intensity precipitation events with sediment deposition where stream gradients flatten and/or at tributary mouths; the chance of elevated soil erosion, sedimentation, runoff, and stream flows are expected to decrease significantly after the first

growing season as a result of natural vegetative recovery in the areas burned at low to moderate soil burn severity; return to the natural hydrologic watershed conditions is probable in three to five years after the fire as a result of natural vegetative recovery in the areas burned at low to moderate soil burn severity.

Implementation

This plan address needs for both emergency stabilization (ES) and burned area rehabilitation (BAR) funding. Based on aerial imagery, flights and ground surveys the Interagency BAER Team identified the following treatments for implementation:

Emergency Stabilization treatments:

- Hazard Warning Signs
- Storm Patrol
- Invasive Species Assessment
- Invasive Species Control
- Floatable Debris Removal
- Heritage Site Protection
- Tree Hazard Assessment
- Tree Hazard Mitigation
- Guard Rail & Traffic Sign Replacement
- Structure Protection
- Project Administration

Burned Area Rehabilitation treatments:

- Reforestation
- Stocking Surveys
- CFI Plot Reestablishment
- Pit Toilet Replacement
- Archeological Survey of Reforestation Locations

The Cayuse Mountain Fire BAER Plan is the initial funding request for ES and BAR funds. This plan may be cited as a justification document to seek additional funding from other sources for recommended treatments that were not covered by ES and BAR. Once this document is reviewed, approved and funded, additional supplemental funding requests may be submitted on an as-needed basis.

Initial ES program funding is limited to one year beginning from the containment date of the fire while the BAR program funding may extend up to five years. At the conclusion of the funding period, a final Accomplishment Report will be due within five years of the containment date to the approving official. The Accomplishment Report will document the funding received (initial and supplemental funding), treatments installed, the effectiveness of the installed treatments, and the results of monitoring activities.

The BAER Team conducted a closeout presentation to BIA Spokane Agency and Spokane Tribe on Friday, September 9, 2016 providing findings and identifying proposed emergency stabilization and rehabilitation treatments. After the closeout, the BAER Team leader will submit the completed Cayuse Mountain Fire BAER Plan to the BIA Spokane Agency, in accordance with interagency Emergency Burned Area Rehabilitation guidelines and timeframes. The Spokane Agency will submit the BAER Plan to the Northwest Region for Regional Director approval, who will then forward this plan to the National Interagency Fire Center for final approval.

BURNED AREA EMERGENCY RESPONSE PLAN

2016 CAYUSE MOUNTAIN FIRE

TABLE OF CONTENTS

PLAN APPROVALS----- i
EXECUTIVE SUMMARY----- ii
TABLE OF CONTENTS----- vii

PART A - FIRE LOCATION AND BACKGROUND INFORMATION----- 1
PART B - NATURE OF PLAN, STABILIZATION OBJECTIVES----- 1
PART C - TEAM ORGANIZATION, RESOURCE ADVISORS,CONSULTATIONS----- 2
PART D - TREATMENT COSTS BY AGENCY & FIRE----- 4
PART E - SUMMARY OF STABILIZATION AND REHABILITATION ACTIVITIES----- 5

PART F - SPECIFICATIONS----- 7

EMERGENCY STABILIZATION (ES)

1. **HAZARD WARNING SIGNS**----- 8
2. **STORM PATROL**----- 10
3. **INVASIVE SPECIES ASSESSMENT**----- 12
4. **INVASIVE SPECIES CONTROL**----- 14
5. **FLOATABLE DEBRIS ASSESSMENT**----- 16
6. **CEMETERY FENCE CONSTRUCTION**----- 18
7. **TREE HAZARD ASSESSMENT**----- 20
8. **TREE HAZARD MITIGATION**----- 22
9. **GUARD RAIL AND TRAFFIC SIGN REPLACEMENT**----- 24
10. **STRUCTURE PROTECTION**----- 26
11. **PROJECT ADMINISTRATION**----- 28

BURN AREA REHABILITATION (BAR)

1. **REFORESTATION**----- 30
2. **STOCKING SURVEYS**----- 32
3. **CFI PLOT REESTABLISHMENT**----- 34
4. **PIT TOILET REPLACEMENT**----- 36
5. **ARCHEOLOGICAL SURVEY OF REFORESTATION LOCATIONS**----- 38

APPENDIX I RESOURCE ASSESSMENTS----- App I
WATERSHED ASSESSMENT----- App I-1
FOREST VEGETATION ASSESSMENT----- App I-17
CULTURAL ASSESSMENT----- App I-26
FISHERIES ASSESSMENT----- App I-29
PUBLIC SAFETY INFRASTRUCTURE ASSESSMENT----- App I-34
WILDLIFE ASSESSMENT----- App I-36

APPENDIX II ENVIRONMENTAL COMPLIANCE----- App II
APPENDIX III PHOTO DOCUMENTATION----- App III
APPENDIX IV MAPS----- App IV
APPENDIX V SUPPORTING DOCUMENTATION----- App V

BURNED AREA EMERGENCY RESPONSE PLAN

2016 CAYUSE MOUNTAIN FIRE

PART A. FIRE LOCATION AND BACKGROUND INFORMATION

Fire Name	Cayuse Mountain	Jurisdiction	Acres
Fire Number	WA-SPA-000024	BIA –Trust	17,767
Agency Unit	Spokane	Private Fee	136
Region	Northwest	BOR	183
State	WA		
County	Stevens		
Ignition Date/ Manner	August 21, 2016 Undetermined		
Zone	WA-SAC		
Date Contained	September 7, 2016	TOTAL ACRES	18,086

PART B. NATURE OF PLAN

I. Type of Plan (check one box below)

	Short-term Emergency Stabilization Plan
	Long-term Rehabilitation
√	Both Long and Short-term Rehabilitation

II. Type of Action (Check One box below)

√	Initial Submission
	Updating Or Revising The Initial Submission
	Supplying Information For Accomplishment To Date On Work Underway
	Different Phase Of Project Plan
	Final Report (To Comply With The Closure Of The EFR Account)

EMERGENCY STABILIZATION OBJECTIVES

- Determine need for and to prescribe and implement emergency treatments
- Minimize threats to human life, safety, and property
- Identify threats to critical cultural and natural resources
- Promptly stabilize and prevent unacceptable degradation to resources

PART C. TEAM ORGANIZATION

BAER TEAM MEMBERS

POSITION	TEAM MEMBER / AFFILIATION
Team Leader	Darryl Martinez, BIA
Deputy Team Leader	Hal Luedtke, BIA
Environmental Compliance/Documentation	Juliette Jeanne, BIA
Forestry/Vegetation	Fred von Bonin, BIA
Cultural Resources	Dan Hall, BIA
Cultural Resources	Harding Polk II, BIA
GIS Specialist	Luther Arizana, BIA
GIS Specialist	Trisha Johnson, Confederated Tribes of Warm Springs
Watershed Modeler	Richard Easterbrook, FWS
Geology/Watershed	Marsha Davis, NPS
Watershed/Fisheries	Rich Pyzik, USFS
Hydrology/Watershed	Katherine Rowden, NWS
Wildlife	Jacob Turner, Spokane Tribe
Safety and Facilities Infrastructure	Kevin Ritzer, Spokane Tribe

RESOURCE ADVISORS: (Note: Resource Advisors are individuals who assisted the BAER Team with the preparation of this plan). See the Consultations section of this plan for a full list of agencies and individuals who were consulted or otherwise contributed to the development of this plan.

Name	Affiliation	Specialty
BJ Kieffer	Spokane Tribe	Dept. Natural Resources
Blaine Kieffer	Spokane Tribe	Fire Management
Brian Crossley	Spokane Tribe	Water and Fish
Andy Moss	Spokane Tribe	Water and Fish
James Harrison	Spokane Tribe	Cultural Preservation
Chad McCrea	Spokane Tribe	Wildlife
Ted Hensold	Spokane Tribe	Forestry
Kevin Ritzer	Spokane Tribe	Forestry
Randy Abrahamson III	Spokane Tribe	Forestry
Tim Leach	Spokane Tribe	GIS
Jacob Turner	Spokane Tribe	Wildlife
Randy Abrahamson II	Spokane Tribe	Tribal Historic Preservation Officer
Greg Wynecoop	Spokane Tribe	Roads
John Matt	Spokane Tribe	Preservation Program
Jackie Corley	Spokane Tribe	Preservation Program
Reggie Peone	Spokane Tribe	Range
Dale Sebastian	Bureau of Indian Affairs	Acting Superintendent
Donna Smith	Bureau of Indian Affairs	Regional Geologist/Mine Representative

CONSULTATIONS

*** See Resource Assessments APPENDIX I , SECTION V, CONSULTATIONS

PART D. TREATMENT COSTS BY REGION AND FIRE

**Northwest Region
2016 CAYUSE MOUNTAIN FIRE**

AGENCY	TREATMENT	TOTAL
BIA	EMERGENCY STABILIZATION (ES)	
ES 1.	Hazard Warning Signs	\$2,476
ES 2.	Storm Patrol	\$105,632
ES 3.	Invasive Species Assessment	\$11,412
ES 4.	Invasive Species Control	\$0
ES 5.	Floatable Debris Removal	\$2,160
ES 6.	Heritage Site Protection	\$1,313
ES 7.	Tree Hazard Assessment	\$5,400
ES 8.	Tree Hazard Mitigation	\$0
ES 9.	Guard Rail & Traffic Sign Replacement	\$192,140
ES 10.	Structure Protection	\$38,735
ES 11.	Project Administration	\$34,068
	TOTAL	\$393,336
BIA	BURNED AREA REHAB (BAR)	
BAR 1.	Reforestation	\$968,500
BAR 2.	Stocking Surveys	\$92,280
BAR 3.	CFI Plot Reestablishment	\$4,530
BAR 4.	Pit Toilet Replacement	\$3,190
BAR 5.	Archeological Survey of Reforestation Locations	\$56,335
	TOTAL	\$1,124,835

2016 CAYUSE MOUNTAIN FIRE

INTERAGENCY BURNED AREA EMERGENCY RESPONSE PLAN

PART E – SUMMARY OF ACTIVITIES – COST SUMMARY TABLE – BUREAU OF INDIAN AFFAIRS

EMERGENCY STABILIZATION ACTIVITIES COST SUMMARY

TREATMENT SPECIFICATION		NFPORS CAT.	UNIT	UNIT COST	# OF UNITS	Fiscal Year			TOTAL
						2017	2018	2019	
NORTHWEST REGION									
ES 1.	Hazard Warning Signs	Protection and Warning	Signs	\$495	5	\$2,476	--	--	\$2,476
ES 2.	Storm Patrol	Roads	Patrol	\$26,408	4	\$105,632	--	--	\$105,632
ES 3.	Invasive Species Assessment	Monitoring	Acres	\$2.24	1,698	\$3,804	\$3,804	\$3,804	\$11,412
ES 4.	Invasive Species Control	Invasive Species	Acres	\$0	1,698	\$0	\$0	\$0	\$0
ES 5.	Floatable Debris Assessment	Roads	Assessment	\$2,160	1	\$2,160	--	--	\$2,160
ES 6.	Cemetery Fence Construction	Heritage Resources	Fence	\$1,313	1	\$1,313	--	--	\$1,313
ES 7.	Tree Hazard Assessment	Assessment	Miles	\$186	29	\$5,400	--	--	\$5,400
ES 8.	Tree Hazard Mitigation	Hazard Removal	Trees	\$0	0	\$0	\$0	\$0	\$0
ES 9.	Guard Rail & Traffic Sign Replacement	Roads	Rails/Signs	\$40/\$114	4715/31	\$192,140	--	--	\$192,140
ES 10.	Structure Protection	Facility & Infrastructure	Feet	\$258	150	\$38,735	--	--	\$38,735
ES 11.	Project Administration	Administration	Implementation	\$34,068	1	\$16,893	\$8,675	\$8,500	\$34,068
TOTAL						\$368,553	\$12,479	\$12,304	\$393,336

REHABILITATION (BAR) ACTIVITIES COST SUMMARY

TREATMENT SPECIFICATION		NFPORS CAT.	UNIT	UNIT COST	# OF UNITS	Fiscal Year					TOTAL
						2017	2018	2019	2020	2021	
NORTHWEST REGION											
BAR 1.	Reforestation	Reforestation	Acres	\$616	1,573	\$242,400	\$483,700	\$242,400	--	--	\$968,500
BAR 2.	Stocking Surveys	Monitoring	Acres	\$11.48	1,608	\$18,456	\$18,456	\$18,456	\$18,456	\$18,456	\$92,280
BAR 3.	CFI Plot Reestablishment	Facility & Infrastructure	Plot	\$73	62	\$4,530	--	--	--	--	\$4,530
BAR 4.	Pit Toilet Replacement	Facility & Infrastructure	Each	\$3,190	1	\$3,190	--	--	--	--	\$3,190
BAR 5.	Archeological Survey of Reforestation Locations	Planning	Acres	\$17.60	3200	\$56,335	--	--	--	--	\$56,335
TOTAL						\$324,911	\$502,156	\$260,856	\$18,456	\$18,456	\$1,124,835

BURNED AREA EMERGENCY RESPONSE PLAN
2016 CAYUSE MOUNTAIN FIRE

PART F SPECIFICATIONS



View at “Ethel’s”

PART F - INDIVIDUAL TREATMENT SPECIFICATION

TREATMENT/ACTIVITY NAME	Hazard Warning Signs	PART E Spec-#	ES-1
NFPORS TREATMENT CATEGORY*	Protection & Warning	FISCAL YEAR(S) (list each year):	2017
NFPORS TREATMENT TYPE *	Warning Signs	WUI? Y / N	Y
IMPACTED COMMUNITIES AT RISK	Wellpinit, WA	IMPACTED T&E SPECIES	N/A

* See NFPORS Restoration & Rehabilitation module - Edit Treatment screen for applicable entries.

WORK TO BE DONE (describe or attach exact specifications of work to be done):

<p>A. General Description: This treatment is for the installation of burned area warning and flood hazard warning signs. These signs will warn the public of dangers on the roads that have changed as a result of the fire. Burned area signs consist of a warning to the public and identifying the possible dangers associated with a burned area. Flood hazard signs warn the public that they are entering an area prone to flooding and/or debris flows during rain events. The signs shall contain language specifying issues to be aware of when entering a burn area such as falling trees and rocks, and flash floods.</p> <p>B. Location/(Suitable) Sites: see Treatments Map – 5 locations total. 1. 2 signs shall be placed on the Wellpinit-Little Falls Road, at both ends where the fire perimeter meets the road. 2. 1 sign shall be placed on the Wynecoop Road where the fire perimeter meets the road. 3. 1 sign shall be placed on the Elijah Road where the fire perimeter meets the road. 4. 1 sign shall be places on Matthews Road east of Matthews Lake where the fire perimeter meets the road.</p> <p>C. Design/Construction Specifications: 1.Hazard Warning Signs: a. Entering Burned Area and Water Crossing signs along the roads shall measure, at a minimum, 4 feet by 4 feet and consist of 0.08” aluminum, sheeted in high intensity orange with black letters. The signs shall read “ENTERING BURNED AREA INCREASED RISK OF FLOODS, FALLING ROCKS, AND FALLING TREES” The lettering shall be a minimum of 5 inches in height and all remaining lettering shall be a minimum of 3.5 inches in height.</p> <p>D. Purpose of Treatment Specifications (relate to damage/change caused by fire): Provide residents, workers, and recreation and traditional users with the necessary information to be prepared for being in a post-fire environment.</p> <p>E. Treatment consistent with Agency Land Management Plan (identify which plan): This treatment is compatible with the <i>Spokane Indian Reservation Wildfire Management Plan 2005</i>.</p> <p>F. Treatment Effectiveness Monitoring Proposed: Implementation Leader will verify installation and locations. Road Maintenance will verify that signs remain in good condition and are visible.</p>
--

LABOR, MATERIALS AND OTHER COST:

PERSONNEL SERVICES: (Grade @ Cost/Hours X # Hours X # Fiscal Years = Cost/Item): Do not include contract personnel costs here (see contractor services below).	COST / ITEM
Laborers: 2 ea. @ \$18/hr. X 24 hrs.	\$864
TOTAL PERSONNEL SERVICE COST	\$864
EQUIPMENT PURCHASE, LEASE AND/OR RENT (Item @ Cost/Hour X # of Hours X #Fiscal Years = Cost/Item): Note: Purchases require written justification that demonstrates cost benefits over leasing or renting.	
Post driver, wrenches, misc. tools	\$150
TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST	\$150

MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item):	
5 "Entering Burn Area..." signs @ \$200.00 each	\$1,000
10 Steel U-channel sign posts @ \$30.00 each	\$300
20 - 3/8" machine bolts, nuts, washers—hex head @ \$3.00 each	\$60
TOTAL MATERIALS AND SUPPLY COST	\$1,360
TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item):	
4 X 4 pickup: 200 miles X \$0.51/ mile	\$102
TOTAL TRAVEL COST	\$102
CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):	
TOTAL CONTRACT COST	\$0

SPECIFICATION COST SUMMARY

FISCAL YEAR	PLANNED INITIATION DATE MM/DD/YYYY	PLANNED COMPLETION DATE (M/D/YYYY)	WORK AGENT	UNITS	UNIT COST	PLANNED ACCOMPLISHMENTS	PLANNED COST
2017	10/1/2016	11/1/2016	F	Signs	\$495	5	\$2,476
TOTAL							\$2,476

Work Agent: C=Coop Agreement, F=Force Account, G=Grantee, P=Permittees, S=Service Contract, T=Timber Sales Purchaser, V=Volunteer

SOURCE OF COST ESTIMATE

1. Estimate obtained from 2-3 independent contractual sources.	
2. Documented cost figures from similar project work obtained from local agency sources.	T, E, P, M
3. Estimate supported by cost guides from independent sources or other federal agencies	
4. Estimates based upon government wage rates and material cost.	P
5. No cost estimate required - cost charged to Fire Suppression Account	

P = Personnel Services, **E** = Equipment **M** = Materials/Supplies, **T** = Travel, **C** = Contract, **F** = Suppression

RELEVANT DETAILS, MAPS AND DOCUMENTATION INCLUDED IN THIS REPORT:

See Treatments Map, Watershed Assessment
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PART F - INDIVIDUAL TREATMENT SPECIFICATION

TREATMENT/ACTIVITY NAME	Storm Patrol	PART E Spec-#	ES-2
NFPORS TREATMENT CATEGORY*	Roads	FISCAL YEAR(S) (list each year):	2017
NFPORS TREATMENT TYPE *	Hazard Removal	WUI? Y / N	Y
IMPACTED COMMUNITIES AT RISK	Wellpinit, WA	IMPACTED T&E SPECIES	N/A

* See NFPORS Restoration & Rehabilitation module - Edit Treatment screen for applicable entries.

WORK TO BE DONE (describe or attach exact specifications of work to be done):

<p>A. General Description: There are many places at risk of inundation, debris deposition, flood damage and other post-fire related impacts from elevated flows carrying sediment and debris. There are several stream crossing within the Cayuse Mountain Fire where these roads could be damaged limiting ingress/egress to the community of Wellpinit, other residences outside the community, and recreational sites. After rainfall events these areas will be assessed for any potential damage to the roads and infrastructure. If the culverts are plugged or damaged then the areas could be cleaned out immediately to avoid further damage during the next rainfall event. Additionally, other values at risk (buildings, well heads, diversion structures, etc.) in the floodplain area will be assessed during storm patrol.</p> <p>The patrols are used to identify those road problems such as plugged culverts and washed out roads and to clear, clean, and/or block those roads that are or have received damage. The storm patrollers shall have access to equipment that can be used when a drainage culvert is plugged or soon to be plugged and to repair any road receiving severe surface erosion. Work should be performed in the morning and early afternoon. Leave drainages when chance of rain is moderate or higher. Store equipment and materials out of flood plains and where chance of loss is low.</p> <p>B. Location/(Suitable) Sites: All primary travel routes within and through the Cayuse Mountain Fire which includes Little Falls Rd., Flett Rd., Elijah Rd., Wynecoop-Cayuse Rd., Sherwood Mine Rd., and Bull Pasture Rd.</p> <p>C. Design/Construction Specifications:</p> <ol style="list-style-type: none"> 1. Inspect and clean road/stream channel crossings prior to the onset of the fall/winter storm season. 2. Immediately after receiving heavy rain the Spokane Tribe/BIA will send out patrols to the roads and facilities of high importance on tribal lands to identify road and other hazard conditions – obstructions such as rocks, sediment, washouts and plugged culverts so the problems can be corrected before they worsen or jeopardize motor vehicle users. 3. The road patrols shall bring in heavy equipment necessary to mechanically remove any obstructions from the roads and culvert inlets and catch basins where necessary. 4. All excess material and debris removed from the drainage system shall be placed outside of the bank-full channel and floodplain where it cannot re-enter stream channels. Preferably the material will be moved off-site. 5. After each storm event, the Spokane Tribe will identify the location(s) along roads, ponds and structures where debris material is located and what debris material has been removed. <p>D. Purpose of Treatment Specifications (relate to damage/change caused by fire): There is an immediate and future threat to travelers along these roads within the burned area due to the increased potential for rolling and falling rock from burned slopes and increased potential for flash floods and debris flows. With the loss of vegetation normal storm frequencies and magnitudes can more easily initiate rill and gully erosion on the slopes and it is likely that this runoff will cover the roads or cause washouts. These events make for hazardous access along steep slopes and put the safety of users at risk.</p> <p>The storm patrol is intended to identify and mitigate issues immediately after a rainfall event to avoid further damage during subsequent events. The purpose of the monitoring is to evaluate the condition of roads for motorized access and to identify and implement additional work needed to maintain and/or repair damage to road surfaces and flow conveyance structures across roads in order to provide safe access across Tribal lands. Spokane Tribe and/or BIA Engineering personnel will survey the roads within the fire perimeter after high-intensity storms. Survey will inspect road surface condition, ditch erosion, and culverts/inlet basins for capacity to accommodate runoff flows.</p> <p>E. Treatment consistent with Agency Land Management Plan (identify which plan): Spokane Indian Reservation Wildfire Management Plan, 2005</p>
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F. Treatment Effectiveness Monitoring Proposed: Monitor roads and culverts after storms and snow melt for possible obstructions and damage, initiate maintenance as necessary.

LABOR, MATERIALS AND OTHER COST:

PERSONNEL SERVICES (Grade @ Cost/Hours X # Hours X # Fiscal Years = Cost/Item): Do not include contract personnel costs here (see contractor services below).	COST / ITEM
Storm Patrol Assessors (GS-7 equiv. @ \$250/day x 2 teams of 2 people x 5 days/event x 4 events)	\$20,000
Project Supervisor (GS-9 equiv. @ \$300/day x 10 days) - patrol	\$3,000
Project Supervisor (GS-9 equiv. @ \$300/day x 10 days) - clearing	\$3,000
TOTAL PERSONNEL SERVICE COST	\$26,000
EQUIPMENT PURCHASE, LEASE AND/OR RENT (Item @ Cost/Hour X # of Hours X #Fiscal Years = Cost/Item): Note: Purchases require written justification that demonstrates cost benefits over leasing or renting.	
JD 160 or equivalent excavator (incl. operator): \$1120/day x 5 days/event x 4 events	\$22,400
140H Grader or equivalent (incl. operator): \$800/day x 5 days/event x 4 events	\$16,000
D6 Dozer (incl. operator): \$680/day x 5 days/event x 4 events	\$13,600
10 yd. Dump truck with 3 axle tilt trailer (incl. operator) \$680/day x 2 dump trucks/trailers x 5 days/event x 4 events	\$27,200
Patrols: 4 X 4 pickup: 100 miles X \$0.54/ mile x 4 patrols x 2 teams	\$432
TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST	\$79,632
MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item):	
TOTAL MATERIALS AND SUPPLY COST	\$0
TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item):	
TOTAL TRAVEL COST	\$0
CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):	
TOTAL CONTRACT COST	\$0

SPECIFICATION COST SUMMARY

FISCAL YEAR	PLANNED INITIATION DATE (MM/DD/YYYY)	PLANNED COMPLETION DATE (M/D/YYYY)	WORK AGENT	UNITS	UNIT COST	PLANNED ACCOMPLISHMENTS	PLANNED COST
2017	10/1/2016	09/30/2017	F	Patrol	\$26,408	4	\$105,632

Work Agent: C=Coop Agreement, F=Force Account, G=Grantee, P=Permittees, S=Service Contract, T=Timber Sales Purchaser, V=Volunteer

SOURCE OF COST ESTIMATE

1. Estimate obtained from 2-3 independent contractual sources.	
2. Documented cost figures from similar project work obtained from local agency sources.	P, M, E, T
3. Estimate supported by cost guides from independent sources or other federal agencies	
4. Estimates based upon government wage rates and material cost.	
5. No cost estimate required - cost charged to Fire Suppression Account	

P = Personnel Services, **E** = Equipment **M** = Materials/Supplies, **T** = Travel, **C** = Contract, **F** = Suppression

RELEVANT DETAILS, MAPS AND DOCUMENTATION INCLUDED IN THIS REPORT:

See Watershed Assessment.

PART F - INDIVIDUAL TREATMENT SPECIFICATION

TREATMENT/ACTIVITY NAME	Invasive Species Assessment	PART E Spec-#	ES-3
NFPORS TREATMENT CATEGORY*	Monitoring	FISCAL YEAR(S) (list each year):	2017, 2018, 2019
NFPORS TREATMENT TYPE *	Ecosystem Recovery Monitoring	WUI? Y / N	Y
IMPACTED COMMUNITIES AT RISK	Wellpinit, WA	IMPACTED T&E SPECIES	N/A

* See NFPORS Restoration & Rehabilitation module - Edit Treatment screen for applicable entries.

WORK TO BE DONE (describe or attach exact specifications of work to be done):

<p>A. General Description: Assess invasive weed encroachment into the fire area focusing particularly on available vector areas (roads dozer lines and safety zones.)</p> <p>B. Location/(Suitable) Sites: Principally 138 miles of roads and 27 miles of dozer lines within and immediately adjacent to the fire area on tribal lands (see BAER Treatments Map.) The acreage of assessment sites are roughly estimated to include all areas within 40 feet from the centerline of all mapped roads and dozer lines (1,419 acres associated with roads and 279 acres associated with dozer lines.)</p> <p>C. Design/Construction Specifications: Conduct annual assessments of roads, dozer lines and other disturbed sites within and immediately adjacent to the fire area using early detection and rapid response (EDRR) methods. Assess for noxious weeds and non-native invasive plant species of concern identified in the Spokane Tribe Vegetation Management Plan. Assessments will generally be conducted in the early summer season. Species occurrence and abundance will be noted and photographed and the locational information will be recorded through global positioning system (GPS) technology. Prepare annual reports documenting accomplishments and associated costs.</p> <p>D. Purpose of Treatment Specifications (relate to damage/change caused by fire): This treatment is necessary to assess weed infestations in an adequately timely manner to plan and implement rapid control measures. EDRR methods will be used to prevent new noxious weed infestation from becoming established to promote the natural recovery of native grasses, forbs, shrubs and trees. Implementation of this treatment will also contribute to overall natural recovery of the fire area through restoration of soil stability, hydrologic function and biotic integrity.</p> <p>E. Treatment consistent with Agency Land Management Plan (identify which plan): Spokane Tribe Draft Vegetation Management Plan and Range Management Plan.</p> <p>F. Treatment Effectiveness Monitoring Proposed: Periodic weed assessments will be documented and maintained on a site-specific basis to determine invasion trends and treatment effectiveness.</p>
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LABOR, MATERIALS AND OTHER COST:

PERSONNEL SERVICES: (Grade @ Cost/Hours X # Hours X # Fiscal Years = Cost/Item): Do not include contract personnel costs here (see contractor services below).	COST / ITEM
Project Management: Natural Resource Specialist 10 days X 8 hours/day @ \$40.00/hour X 3 fiscal years	\$9,600
TOTAL PERSONNEL SERVICE COST	\$9,600
EQUIPMENT PURCHASE, LEASE AND/OR RENT (Item @ Cost/Hour X # of Hours X #Fiscal Years = Cost/Item): Note: Purchases require written justification that demonstrates cost benefits over leasing or renting.	
TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST	\$0
MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item):	

TOTAL MATERIALS AND SUPPLY COST	\$0
TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item):	
1 4WD pickup @\$40/day X 10 days X 3 fiscal years	\$1,200
UTV 30 miles/day @\$0.68/mile @ 10 days X 3 fiscal years	\$612
TOTAL TRAVEL COST	\$1,812
CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):	
TOTAL CONTRACT COST	\$0

SPECIFICATION COST SUMMARY

FISCAL YEAR	PLANNED INITIATION DATE (M/D/YYYY)	PLANNED COMPLETION DATE (M/D/YYYY)	WORK AGENT	UNITS	UNIT COST	PLANNED ACCOMPLISHMENTS	PLANNED COST
2017	3/1/2017	5/30/2017	F	Acre	\$2.24	1,698	\$3,804
2018	3/1/2018	5/30/2018	F	Acre	\$2.24	1,698	\$3,804
2019	3/1/2019	5/30/2019	F	Acre	\$2.24	1,698	\$3,804
TOTAL							\$11,412

Work Agent: C=Coop Agreement, F=Force Account, G=Grantee, P=Permittees, S=Service Contract, T=Timber Sales Purchaser, V=Volunteer

SOURCE OF COST ESTIMATE

1. Estimate obtained from 2-3 independent contractual sources.	
2. Documented cost figures from similar project work obtained from local agency sources.	
3. Estimate supported by cost guides from independent sources or other federal agencies	
4. Estimates based upon government wage rates and material cost.	P, T
5. No cost estimate required - cost charged to Fire Suppression Account	

P = Personnel Services, **E** = Equipment **M** = Materials/Supplies, **T** = Travel, **C** = Contract, **F** = Suppression

RELEVANT DETAILS, MAPS AND DOCUMENTATION INCLUDED IN THIS REPORT:

See Forest and Vegetation Resource Assessment and Treatments Map.

PART F - INDIVIDUAL TREATMENT SPECIFICATION

TREATMENT/ACTIVITY NAME	Invasive Species Control	PART E Spec-#	ES-4
NFPORS TREATMENT CATEGORY*	Invasive Species	FISCAL YEAR(S) (list each year):	2017, 2018, 2019
NFPORS TREATMENT TYPE *	Chemical, Biological Treatment	WUI? Y / N	Y
IMPACTED COMMUNITIES AT RISK	Wellpinit, WA	IMPACTED T&E SPECIES	N/A

* See NFPORS Restoration & Rehabilitation module - Edit Treatment screen for applicable entries.

WORK TO BE DONE (describe or attach exact specifications of work to be done):

<p>A. General Description: Combination of chemical and biological control treatments of invasive weed populations identified during annual assessment monitoring. Focus of assessment and treatment will be primarily in susceptible vector areas (roads dozer lines and safety zones.)</p> <p>B. Location/(Suitable) Sites: All sites of identified invasive weed occurrence based on annual assessments, principally 138 miles of roads and 27 miles of dozer lines on tribal lands within and immediately adjacent to the fire area (see BAER Treatments Map.) The acreage of assessment sites is roughly estimated to include all areas within 40 feet of the center line of all mapped roads and dozer lines (1,419 acres associated with roads and 279 acres associated with dozer lines.)</p> <p>C. Design/Construction Specifications: Combination of chemical, biological and other integrated pest management treatments. Chemical selection and application methods and rates will conform with guidelines detailed in the Tribe's Vegetation Management Plan and label directions. Chemical treatments may include spot and broadcast application using sprayers mounted on pickups and utility vehicles (UTV.) Treatment areas will be mapped using global positioning system (GPS) technology. Prepare annual reports documenting accomplishments and associated costs.</p> <p>D. Purpose of Treatment Specifications (relate to damage/change caused by fire): This treatment is necessary to rapidly control encroachment of invasive weeds onto disturbed areas, particularly those subject to introduction by road and equipment traffic. Early detection and rapid response (EDRR) methods will be used to prevent new noxious weed infestation from becoming established to promote the natural recovery of native grasses, forbs, shrubs and trees. Implementation of this treatment will also contribute to overall natural recovery of the fire area through restoration of soil stability, hydrologic function and biotic integrity.</p> <p>E. Treatment consistent with Agency Land Management Plan (identify which plan): Spokane Tribe Draft Vegetation Management Plan and Range Management Plan.</p> <p>F. Treatment Effectiveness Monitoring Proposed: Periodic weed assessments will be documented and maintained on a site-specific basis to determine invasion trends and treatment effectiveness.</p>

Quantities and costs provided are for informational purposes only. Actual figures will be determined after assessment is completed and then submitted with plan amendment.

LABOR, MATERIALS AND OTHER COST:

PERSONNEL SERVICES: (Grade @ Cost/Hours X # Hours X # Fiscal Years = Cost/Item): Do not include contract personnel costs here (see contractor services below).	COST / ITEM
Project Management: Natural Resource Specialist 30 days X 8 hours/day @ \$\$\$\$ /hour X 3 fiscal years	
TOTAL PERSONNEL SERVICE COST	
EQUIPMENT PURCHASE, LEASE AND/OR RENT (Item @ Cost/Hour X # of Hours X #Fiscal Years = Cost/Item): Note: Purchases require written justification that demonstrates cost benefits over leasing or renting.	
100 gallon UTV Tank Sprayer @ \$\$\$\$ each	
TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST	

MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item):	
Herbicide ??? acres @ \$\$\$/acre	
Surfactant ??? acres @ \$\$\$/acre	
TOTAL MATERIALS AND SUPPLY COST	
TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item):	
1 4WD pickup @ \$\$\$/day X 30 days X 3 fiscal years	
2 UTV 30 miles/day @ \$\$\$/mile @ 30 days X 3 fiscal years	
TOTAL TRAVEL COST	
CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):	
Application 1 hour/3 acres @ \$\$\$/hour X ??? acres X 3 fiscal years	
TOTAL CONTRACT COST	

SPECIFICATION COST SUMMARY

FISCAL YEAR	PLANNED INITIATION DATE (M/D/YYYY)	PLANNED COMPLETION DATE (M/D/YYYY)	WORK AGENT	UNITS	UNIT COST	PLANNED ACCOMPLISHMENTS	PLANNED COST
2017	3/1/2017	9/30/2017	F	Acre	\$		
2018	3/1/2018	9/30/2018	F	Acre	\$		
2019	3/1/2019	9/30/2019	F	Acre	\$		
TOTAL							\$0

Work Agent: C=Coop Agreement, F=Force Account, G=Grantee, P=Permittees, S=Service Contract, T=Timber Sales Purchaser, V=Volunteer

SOURCE OF COST ESTIMATE

1. Estimate obtained from 2-3 independent contractual sources.	M, E
2. Documented cost figures from similar project work obtained from local agency sources.	
3. Estimate supported by cost guides from independent sources or other federal agencies	
4. Estimates based upon government wage rates and material cost.	P, T
5. No cost estimate required - cost charged to Fire Suppression Account	

P = Personnel Services, **E** = Equipment **M** = Materials/Supplies, **T** = Travel, **C** = Contract, **F** = Suppression

RELEVANT DETAILS, MAPS AND DOCUMENTATION INCLUDED IN THIS REPORT:

See Treatments Map and Forest and Vegetation Resource Assessment.

PART F- INDIVIDUAL TREATMENT SPECIFICATION

TREATMENT/ACTIVITY NAME	Floatable Debris Assessment	PART E Spec-#	ES-5
NFPORS TREATMENT CATEGORY*	Assessment	FISCAL YEAR(S) (list each year):	2017
NFPORS TREATMENT TYPE *	Risk Assessment	WUI? Y / N	Y
IMPACTED COMMUNITIES AT RISK	Wellpinit, WA	IMPACTED T&E SPECIES	N/A

* See NFPORS Restoration & Rehabilitation module - Edit Treatment screen for applicable entries.

WORK TO BE DONE (describe or attach exact specifications of work to be done):

<p>A. General Description: Burned drainages within the Cayuse Mountain Fire burn perimeter may experience increased runoff and flow in ephemeral stream channels that typically see very little flow. It was noted during the BAER team’s field reconnaissance that in some areas, stream channels and their floodways contained discarded debris of various types such as pulled culverts, appliances and car parts. Some materials were seen that could potentially contain hazardous materials. This floatable debris could become mobilized in a flood event and potentially impact downstream residences, roads and motorists, and/or eventually be deposited in the Spokane River arm of Lake Roosevelt.</p> <p>An assessment needs to be completed to quantify the amount of debris that should be removed, identify potential hazardous material sites and develop specs and cost estimates for removal, which will be submitted for supplemental ES funds.</p> <p>B. Location/Suitable Sites: Assessment focus is within and through the Cayuse Mountain burned area, on stream channels upstream of primary travel routes and homes. This includes Wellpinit-Little Falls Road, Flett Road, Elijah Road, Wynecoop-Cayuse Road, Sherwood Mine Road, and Bull Pasture Road (a.k.a. No Docks Road), and above homes in the Raymond-Wynecoop Canyon and the Sherwood Mountain drainage (see treatment map).</p> <p>C. Design/Construction Specifications:</p> <ol style="list-style-type: none"> 1. Conduct field reconnaissance to identify and map locations of floatable discarded debris and/or hazardous materials in stream channels and estimate quantities. 2. Based on field work, prepare cost estimates and specs for discarded debris removal, including material, labor, and costs. 3. Work with hazardous materials specialist to prepare cost estimates and specs for hazardous materials removal, including material, labor, and costs <p>D. Purpose of Treatment Specifications (relate to damage/change caused by fire): The purpose of this specification is to assess the scope and range of occurrences of floatable discarded debris and hazardous materials in stream channels burned by the Cayuse Mountain Fire and to prepare treatment specification for debris removal, to submit for supplemental ES funds.</p> <p>E. Treatment consistent with Agency Land Management Plan (identify which plan): Protection of beneficiaries is consistent with the BIA’s mission. Integrated Resource Management Plan for the Spokane Indian Reservation.</p> <p>F. Treatment Effectiveness Monitoring Proposed: Implementation of the treatments by the summer of 2017 should be considered effective. Once implemented, the amount of discarded debris and hazardous materials deposited downstream during flood events will be inversely proportional to the effectiveness of the implemented treatments.</p>

LABOR, MATERIALS AND OTHER COST:

PERSONNEL SERVICES: (Grade @ Cost/Hours X # Hours X # Fiscal Years = Cost/Item): Do not include contract personnel costs here (see contractor services below).	COST / ITEM
Laborer/Technician @ \$25/hr x 40 hours	\$1,000
Hazardous Materials Specialist (GS11 or equivalent) @ \$GS11 \$350/day x 2 days	\$700
TOTAL PERSONNEL SERVICE COST	\$1,700
EQUIPMENT PURCHASE, LEASE AND/OR RENT (Item @ Cost/Hour X # of Hours X #Fiscal Years = Cost/Item):	

Note: Purchases require written justification that demonstrates cost benefits over leasing or renting.	
One truck @ \$40/day x 4 days	\$160
TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST	\$160
MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item):	
TOTAL MATERIALS AND SUPPLY COST	
TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #nights = Cost/Item):	
Hazardous Materials Specialist @ \$150/night x 2 nights	\$300
TOTAL TRAVEL COST	\$300
CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):	
TOTAL CONTRACT COST	\$2,160

SPECIFICATION COST SUMMARY

FISCAL YEAR	PLANNED INITIATION DATE (M/D/YYYY)	PLANNED COMPLETION DATE (M/D/YYYY)	WORK AGENT	UNITS	UNIT COST	PLANNED ACCOMPLISHMENTS	PLANNED COST
FY17	10/01/2016	12/31/2016	F	Assess.	\$2,160	1	\$2,160
TOTAL							\$2,160

Work Agent: C=Coop Agreement, F=Force Account, G=Grantee, P=Permittees, S=Service Contract, T=Timber Sales Purchaser, V=Volunteer

SOURCE OF COST ESTIMATE

1. Estimate obtained from 2-3 independent contractual sources.	
2. Documented cost figures from similar project work obtained from local agency sources.	P, T
3. Estimate supported by cost guides from independent sources or other federal agencies	
4. Estimates based upon government wage rates and material cost.	
5. No cost estimate required - cost charged to Fire Suppression Account	

P = Personnel Services, **E** = Equipment **M** = Materials/Supplies, **T** = Travel, **C** = Contract, **F** = Suppression

RELEVANT DETAILS, MAPS AND DOCUMENTATION INCLUDED IN THIS REPORT:

Cayuse Mountain Treatment Map.

PART F- INDIVIDUAL TREATMENT SPECIFICATION

TREATMENT/ACTIVITY NAME	Cemetery Fence Construction	PART E Spec-#	ES-6
NFPORS TREATMENT CATEGORY*	Heritage Resources	FISCAL YEAR(S) (list each year):	2017
NFPORS TREATMENT TYPE *	Site Protection	WUI? Y / N	Yes
IMPACTED COMMUNITIES AT RISK	Wellpinit, WA	IMPACTED T&E SPECIES	none

* See NFPORS Restoration & Rehabilitation module - Edit Treatment screen for applicable entries.

WORK TO BE DONE (describe or attach exact specifications of work to be done):

<p>A. General Description: Remove fire damaged cemetery enclosure fence and reconstruct new boundary fence surrounding an approximately 35 feet by 35 feet (1225 sq.ft.) cemetery that was damaged during the Cayuse Mountain Fire. The fence will be needed for protection of a small family cemetery from herds of feral/wild horses and other livestock.</p> <p>B. Location/(Suitable) Sites: The cemetery is located on a small hillock north and northeast of Elijah Road approximately 3 miles west-southwest of Wellpinit.</p> <p>C. Design/Construction Specifications: Remove fire damaged enclosure fence and reconstruct approximately 140 feet of barbed wire fence constructed to approximate pre-fire conditions.</p> <p>D. Purpose of Treatment Specifications (relate to damage/change caused by fire): Livestock can cause considerable ground disturbance and disturbance to above ground memorial features at gravesites. Livestock hooves and a tendency of livestock to rub against stationary objects such as grave stones would degrade the integrity of the cemetery. The exclusion of livestock will protect the individual graves from degradation resulting from cattle and horse trampling. Furthermore, fencing would also help maintain the memorial esthetic that would be ruined by the accumulation of livestock dung.</p> <p>The fire burned wood components of the cemetery's enclosing fenceline. The damaged fence would need to be removed and a new fence constructed in the same location. The fence replacement needs to be completed prior to livestock turnout for proper livestock exclusion.</p> <p>E. Describe Treatment Effectiveness Monitoring BIA and/or tribal range personnel will complete the removal and construction of the fences and to pre-fire condition within the timeframe specified.</p> <p>F. Why is the Treatment/Activity Reasonable, within Policy (identify Agency land management plan), and Cost Effective? Reconstruction of cemetery fence damaged by the fire would maintain the integrity and memorial esthetic of the existing cemetery and prevent the incursion of livestock and potential degradation of individual gravesites. Replacement of entire fence would prevent a mismatched appearance of a repaired fence suggesting a lack of concern for the memorialization and remembrance of passed tribal members. A properly constructed fence will ensure the exclusion of livestock bringing peace of mind to remaining living family members. It is cost effective in preventing traumatization of the surviving family members.</p>

LABOR, MATERIALS AND OTHER COST:

PERSONNEL SERVICES: (Grade @ Cost/Hours X # Hours X # Fiscal Years = Cost/Item): Do not include contract personnel costs here (see contractor services below).	COST / ITEM
3 Range/habitat technicians @ \$170/day X 2 days = \$1020	\$1020
TOTAL PERSONNEL SERVICE COST	\$1020
EQUIPMENT PURCHASE, LEASE AND/OR RENT (Item @ Cost/Hour X # of Hours X #Fiscal Years = Cost/Item): Note: Purchases require written justification that demonstrates cost benefits over leasing or renting.	
TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST	
MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item):	
Fence supplies: 24 treated wood fence posts (\$216), barbed wire (\$60), etc. = \$276	\$276
TOTAL MATERIALS AND SUPPLY COST	\$276

TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item):	
GSA light pickup @ \$0.70 X 12 miles/day X 2 days X 1 year = \$16.80 (includes lease and mileage costs)	\$17
TOTAL TRAVEL COST	\$17
CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):	
TOTAL CONTRACT COST	

SPECIFICATION COST SUMMARY

FISCAL YEAR	PLANNED INITIATION DATE (M/D/YYYY)	PLANNED COMPLETION DATE (M/D/YYYY)	WORK AGENT	UNITS	UNIT COST	PLANNED ACCOMPLISHMENTS	PLANNED COST
2017	10/01/2016	010/31/2016	F	Fence	\$1313	1	\$1,313
TOTAL							\$1,313

Work Agent: C=Coop Agreement, F=Force Account, G=Grantee, P=Permittees, S=Service Contract, T=Timber Sales Purchaser, V=Volunteer

SOURCE OF COST ESTIMATE

1. Estimate obtained from 2-3 independent contractual sources.	
2. Documented cost figures from similar project work obtained from local agency sources.	P, M, T
3. Estimate supported by cost guides from independent sources or other federal agencies	
4. Estimates based upon government wage rates and material cost.	
5. No cost estimate required - cost charged to Fire Suppression Account	

P = Personnel Services, E = Equipment M = Materials/Supplies, T = Travel, C = Contract, F = Suppression

RELEVANT DETAILS, MAPS AND DOCUMENTATION INCLUDED IN THIS REPORT:

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PART F - INDIVIDUAL TREATMENT SPECIFICATION

TREATMENT/ACTIVITY NAME	Tree Hazard Assessment	PART E Spec-#	ES-7
NFPORS TREATMENT CATEGORY*	Assessment	FISCAL YEAR(S) (list each year):	2017
NFPORS TREATMENT TYPE *	Risk Assessment	WUI? Y / N	Y
IMPACTED COMMUNITIES AT RISK	Wellpinit, WA	IMPACTED T&E SPECIES	N/A

* See NFPORS Restoration & Rehabilitation module - Edit Treatment screen for applicable entries.

WORK TO BE DONE (describe or attach exact specifications of work to be done):

<p>A. General Description: Assess primary system roads within the fire perimeter to determine number and location of tree hazards. By permission of the owner, assess all residences within the fire perimeter. Based on assessment potentially prepare a plan amendment to request funds for tree hazard mitigation.</p> <p>B. Location/(Suitable) Sites: Assessment will focus on approximately 29 miles of identified intermediate (IDR) and light duty (LDR) system roads occurring on Tribal lands within the fire perimeter. See Treatments Map for location of primary assessment areas. Additional areas may be added to the assessment as deemed necessary.</p> <p>C. Design/Construction Specifications: Assess all trees within striking distance of road edges and within striking distance of 98 identified residences, barns and or other outbuildings. Assessment will conform to the National Park Service Tree Hazard Rating System. Tree hazards to be mitigated must have been killed or damaged by the wildfire and must display an overall hazard rating of five or above. Designate each identified tree hazard with paint or "Danger Tree" or "Hazard" flagging and record the following information: species, diameter breast height, hazard rating. GPS the location of the tree hazard. Assessment will be completed as soon as possible to insure mitigation treatments can be initiated in a timely manner.</p> <p>D. Purpose of Treatment Specifications (relate to damage/change caused by fire): Assess number, size and location of tree hazards in order to prepare a BAER plan amendment to request funds for mitigation treatment.</p> <p>E. Treatment consistent with Agency Land Management Plan (identify which plan): Spokane Tribe Forest Management Plan 2009.</p> <p>F. Treatment Effectiveness Monitoring Proposed: Forestry staff will conduct field checks to insure work quality.</p>

LABOR, MATERIALS AND OTHER COST:

PERSONNEL SERVICES: (Grade @ Cost/Hours X # Hours X # Fiscal Years = Cost/Item): Do not include contract personnel costs here (see contractor services below).	COST / ITEM
Tree Hazard Assessment: 1 Forester @ \$40.00/hour X 8 hours/day X 10 days	\$3,200
1 Forestry Technician @ \$20.00/hour X 8 hours/day X 10 days	\$1,600
TOTAL PERSONNEL SERVICE COST	\$4,800
EQUIPMENT PURCHASE, LEASE AND/OR RENT (Item @ Cost/Hour X # of Hours X #Fiscal Years = Cost/Item): Note: Purchases require written justification that demonstrates cost benefits over leasing or renting.	
TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST	\$0
MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item):	
Marking paint, flagging, miscellaneous supplies	\$200
TOTAL MATERIALS AND SUPPLY COST	\$200

TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item):	
1 GSA 4WD Pickup @\$40/day X 10 days	\$400
TOTAL TRAVEL COST	\$400
CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):	
TOTAL CONTRACT COST	\$0

SPECIFICATION COST SUMMARY

FISCAL YEAR	PLANNED INITIATION DATE (M/D/YYYY)	PLANNED COMPLETION DATE (M/D/YYYY)	WORK AGENT	UNITS	UNIT COST	PLANNED ACCOMPLISHMENTS	PLANNED COST
2017	10/1/2016	11/1/2016	F	Miles	\$186	29	\$5,400
TOTAL							\$5,400

Work Agent: C=Coop Agreement, F=Force Account, G=Grantee, P=Permittees, S=Service Contract, T=Timber Sales Purchaser, V=Volunteer

SOURCE OF COST ESTIMATE

1. Estimate obtained from 2-3 independent contractual sources.	
2. Documented cost figures from similar project work obtained from local agency sources.	M
3. Estimate supported by cost guides from independent sources or other federal agencies	
4. Estimates based upon government wage rates and material cost.	P, T
5. No cost estimate required - cost charged to Fire Suppression Account	

P = Personnel Services, **E** = Equipment **M** = Materials/Supplies, **T** = Travel, **C** = Contract, **F** = Suppression

RELEVANT DETAILS, MAPS AND DOCUMENTATION INCLUDED IN THIS REPORT:

See Forest and Vegetation Resource Assessment and Treatments Map.

PART F - INDIVIDUAL TREATMENT SPECIFICATION

TREATMENT/ACTIVITY NAME	Tree Hazard Mitigation	PART E Spec-#	ES-8
NFPORS TREATMENT CATEGORY*	Public Safety	FISCAL YEAR(S) (list each year):	2017
NFPORS TREATMENT TYPE *	Hazard Removal	WUI? Y / N	Y
IMPACTED COMMUNITIES AT RISK	Wellpinit, WA	IMPACTED T&E SPECIES	N/A

* See NFPORS Restoration & Rehabilitation module - Edit Treatment screen for applicable entries.

WORK TO BE DONE (describe or attach exact specifications of work to be done):

<p>A. General Description: Fall identified imminent tree hazards for the safety of the public within one tree length of and posing a threat to homes and outbuildings, recreational use of developed sites and main access roads.</p> <p>B. Location/(Suitable) Sites: Designated areas near roads, buildings and other public use areas as identified during the Tree Hazard Assessment.</p> <p>C. Design/Construction Specifications:</p> <ol style="list-style-type: none"> 1. Directionally fall remaining identified tree hazards away from roads, homes and outbuildings. 2. Flush cut stumps as low as possible 3. To be performed by Tribal employees who are qualified Fallers --For all trees (including those previously cut during fire suppression activities and those to be cut by contractor), leave trees whole tree length (minimum 4" diameter top) where practicable or buck into merchantable lengths (10' 6" minimum to 25' maximum). Trees will be bucked, as necessary, to merchantable (even 2' lengths >10', with 6" trim to 20', and 12" trim >20') lengths to maximum 24' (with 12" trim). Limb bole and pile or chip slash. <p>D. Purpose of Treatment Specifications (relate to damage/change caused by fire): To ensure the safety of workers and the public.</p> <p>E. Treatment consistent with Agency Land Management Plan (identify which plan): SIR Forest and Woodland Resource Management Plan.</p> <p>F. Treatment Effectiveness Monitoring Proposed: Final report of the number of trees felled and associated cost.</p>
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LABOR, MATERIALS AND OTHER COST:

PERSONNEL SERVICES: (Grade @ Cost/Hours X # Hours X # Fiscal Years = Cost/Item): Do not include contract personnel costs here (see contractor services below).	COST / ITEM
Crew Boss Sawyer 1 @ \$40/Hr. X Hrs	\$0
Hand Crew Sawyer 2 @ \$20 /Hr. X Hrs	\$0
Crew Boss Laborer 1 @ \$40/Hr. X Hrs	\$0
Hand Crew Laborer 2 @ \$20/Hr. X Hrs	\$0
TOTAL PERSONNEL SERVICE COST	\$0
EQUIPMENT PURCHASE, LEASE AND/OR RENT (Item @ Cost/Hour X # of Hours X #Fiscal Years = Cost/Item): Note: Purchases require written justification that demonstrates cost benefits over leasing or renting.	
Chainsaw-- Wear, Tear, and Replacement	\$0
TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST	\$0
MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item):	
Saw Fuel @ \$4.00/Gal. x 10 Gals.	\$0
2-Cycle Mix @ \$31.99/Gal. x 1 Gal.	\$0
Bar Oil @ \$13.29/Gal. x 10 Gals.	\$0
Saw Chain @ \$42.00/Ea. x 4 Ea.	\$0
Wedges, Files, Etc.	\$0
TOTAL MATERIALS AND SUPPLY COST	\$0
TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item):	
GSA 4WD Pickups 4 @ \$28.00/Day	\$0

TOTAL TRAVEL COST	\$0
CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):	
AD-I Faller Class C (FALC) 2 @ \$31.16/Hr. x 40 Hrs.	\$0
TOTAL CONTRACT COST	\$0

SPECIFICATION COST SUMMARY

FISCAL YEAR	PLANNED INITIATION DATE (M/D/YYYY)	PLANNED COMPLETION DATE (M/D/YYYY)	WORK AGENT	UNITS	UNIT COST	PLANNED ACCOMPLISHMENTS	PLANNED COST
2017	10/1/2016	9/30/2017	S	Trees	\$0		\$0
TOTAL							\$0

Work Agent: C=Coop Agreement, F=Force Account, G=Grantee, P=Permittees, S=Service Contract, T=Timber Sales Purchaser, V=Volunteer

SOURCE OF COST ESTIMATE

1. Estimate obtained from 2-3 independent contractual sources.	E, M
2. Documented cost figures from similar project work obtained from local agency sources.	C
3. Estimate supported by cost guides from independent sources or other federal agencies	
4. Estimates based upon government wage rates and material cost.	P
5. No cost estimate required - cost charged to Fire Suppression Account	

P = Personnel Services, **E** = Equipment **M** = Materials/Supplies, **T** = Travel, **C** = Contract, **F** = Suppression

RELEVANT DETAILS, MAPS AND DOCUMENTATION INCLUDED IN THIS REPORT:

See Forest and Vegetation Assessment. See Appendix IV,
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PART F - INDIVIDUAL TREATMENT SPECIFICATION

TREATMENT/ACTIVITY NAME	Guardrail and Traffic Sign Replacement	PART E BIA Spec-#	ES-9
NFPORS TREATMENT CATEGORY*	Protection & Warning	FISCAL YEAR(S) (list each year):	2017
NFPORS TREATMENT TYPE *	Protective Barriers/Warning Signs	WUI? Y / N	Y
IMPACTED COMMUNITIES AT RISK	Wellpinit, WA	IMPACTED T&E SPECIES	NA

* See NFPORS Restoration & Rehabilitation module - Edit Treatment screen for applicable entries.

WORK TO BE DONE (describe or attach exact specifications of work to be done):

<p>A. General Description: The Cayuse Mountain Fire damaged highway guardrails and a number of traffic warning signs on the Spokane Indian Reservation. Provide for replacement of steel guardrail, traffic warning signs and reflective markers. Replace 4,715 feet of guardrail and 31 road signs.</p> <p>B. Location/(Suitable) Sites: See attached map for specific locations of guard rail and warning sign replacements.</p> <p>C. Design/Construction Specifications:</p> <ol style="list-style-type: none"> 1. Replace 4,715 feet of guardrail using steel support posts. 2. Replacement or repair of 31 traffic and directional signs and 27 posts damaged by the fire. <p>D. Purpose of Treatment Specifications (relate to damage/change caused by fire): Guardrails are needed to prevent vehicles from traveling down the steep slopes. Safety road signs are needed to prevent accidents to vehicles and pedestrians.</p> <p>E. Treatment consistent with Agency Land Management Plan (identify which plan): Integrated Resource Management Plan for the Spokane Indian Reservation</p> <p>F. Treatment Effectiveness Monitoring Proposed: Implementation Leader will verify installation of guardrail and safety signs.</p>
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LABOR, MATERIALS AND OTHER COST:

PERSONNEL SERVICES: (Grade @ Cost/Hours X # Hours X # Fiscal Years = Cost/Item): Do not include contract personnel costs here (see contractor services below).	COST / ITEM
TOTAL PERSONNEL SERVICE COST	
EQUIPMENT PURCHASE, LEASE AND/OR RENT (Item @ Cost/Hour X # of Hours X #Fiscal Years = Cost/Item): Note: Purchases require written justification that demonstrates cost benefits over leasing or renting.	
TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST	
MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item):	
TOTAL MATERIALS AND SUPPLY COST	
TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item):	
TOTAL TRAVEL COST	
CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):	
Install metal guardrail with steel posts 4,715 feet @ \$40/ft. X 1 Fiscal Year =	\$188,600
Replace wood posts 27 posts @ \$45/post X 1 Fiscal Year =	\$1,215
Replace signs 31 signs @ \$75/sign X 1 Fiscal Year =	\$2,325
TOTAL CONTRACT COST	\$192,140

SPECIFICATION COST SUMMARY

FISCAL YEAR	PLANNED INITIATION DATE (M/D/YYYY)	PLANNED COMPLETION DATE (M/D/YYYY)	WORK AGENT	UNITS	UNIT COST	PLANNED ACCOMPLISHMENTS	PLANNED COST
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2017	10/1/2016	12/30/2016	S	linear feet	\$40	4,715	\$188,600
2017	10/1/2016	12/30/2016	S	Signs	\$114	31	\$3,540
TOTAL							\$192,140

Work Agent: C=Coop Agreement, F=Force Account, G=Grantee, P=Permittees, S=Service Contract, T=Timber Sales Purchaser, V=Volunteer

SOURCE OF COST ESTIMATE

1. Estimate obtained from 2-3 independent contractual sources.	
2. Documented cost figures from similar project work obtained from local agency sources.	C,M
3. Estimate supported by cost guides from independent sources or other federal agencies	
4. Estimates based upon government wage rates and material cost.	
5. No cost estimate required - cost charged to Fire Suppression Account	

P = Personnel Services, **E** = Equipment **M** = Materials/Supplies, **T** = Travel, **C** = Contract, **F** = Suppression

RELEVANT DETAILS, MAPS AND DOCUMENTATION INCLUDED IN THIS REPORT:

See Public Safety Infrastructure Assessment and Treatment Map

PART F - INDIVIDUAL TREATMENT SPECIFICATION

TREATMENT/ACTIVITY NAME	Structure Protection	PART E Spec-#	ES-10
NFPORS TREATMENT CATEGORY*	Facility & Infrastructure	FISCAL YEAR(S) (list each year):	2017
NFPORS TREATMENT TYPE *	Protect Structures	WUI? Y / N	Y
IMPACTED COMMUNITIES AT RISK	Wellpinit, WA	IMPACTED T&E SPECIES	N/A

* See NFPORS Restoration & Rehabilitation module - Edit Treatment screen for applicable entries.

WORK TO BE DONE (describe or attach exact specifications of work to be done):

<p>A. General Description: The purpose of this treatment is to reduce/mitigate the risk of flooding to the residential structure. This proposed treatment is to provide some level of protection to the residential structure from potential small post-fire flooding and sedimentation events. Protection will consist of constructing continuous flood barriers made of 30-foot Hesco™ barrier units filled with well graded sands and gravel, with K-rail supports along the leading (streamside) edge. Placement of these structures is a temporary solution designed to provide some level of protection of the residence due to smaller floods and sedimentation and should not be considered as life safety protection from a large flash flood event or debris flow. These structures should remain in place until a more formal evaluation of site conditions and a determination of site defensibility for larger runoff events is made. Subsequent to a determination of site defensibility a design can be completed and an engineered flood and debris flow protection mitigation measure can be implemented. <u>The Spokane Tribe should make a formal request to the NRCS as soon as possible for technical assistance with this situation.</u></p> <p>B. Location/(Suitable) Sites: Private residence at outlet of the Flett-Raymond Canyon watershed on the Wynecoop-Cayuse Mountain Road. (See: Watershed Treatment Map)</p> <p>C. Design/Construction Specifications: <u>General specifications for placement of Hesco™ Barriers with Concrete Barriers (K-rails):</u> 1. Install approximately five 30-ft. Hesco barriers filled with well graded gravel/sand mixture. Fifteen 10 foot K- rails to be placed along leading (streamside) edge of Hesco™ barriers. 2. Level site for Hesco Containers and K-rails with backhoe or suitable equipment 3. Hesco™ barriers and K-rails should be placed end to end on level ground. 4. Fill Hesco™ barriers with a well graded mix of gravel and sand, per manufacturer's instructions. 5. Sandbags need to be placed in a single row and against the seams on uphill side of K-rail and a single row on downhill side. 6. To maximize their effectiveness, K-rails should be inter-pinned with 30 inch length, 8 gauge rebar. 7. K-rails delivered to site must not be staged in drainages. 8. Store any extra sandbags in locations to easily deploy if needed. 9. Delivered or stored sandbags will not be placed in stream channels. 10. Inspect sites after large storm events, clean out sediment; replace damaged sand bags.</p> <p>D. Purpose of Treatment Specifications (relate to damage/change caused by fire): The purpose of this treatment is to protect residential structures from smaller post-fire flooding and sedimentation events that may cause Flett-Raymond Canyon Creek to overflow its banks. Watershed modeling results show a post-fire percent increase in peak flows of 337% at this location and a high potential for debris flows.</p> <p>E. Treatment consistent with Agency Land Management Plan (identify which plan): Spokane Indian Reservation Wildfire Management Plan, 2005</p> <p>F. Treatment Effectiveness Monitoring Proposed: After streamflow events, observe whether or not the concrete barriers and sandbags have been damaged and need maintenance, and repair accordingly.</p>

LABOR, MATERIALS AND OTHER COST:

PERSONNEL SERVICES: (Grade @ Cost/Hours X # Hours X # Fiscal Years = Cost/Item): Do not include contract personnel costs here (see contractor services below).	COST / ITEM
Equipment Operator : WG-10 or equivalent @ \$65/hr. x 24 hours x 2 operators	\$3120
Staff Engineer / supervisor: GS-11 or equivalent @ \$75/hr. x 24 hours	\$1800
4- person crew (barrier assembly and sandbagging) @ \$600/day x 3 days	\$1800
TOTAL PERSONNEL SERVICE COST	\$6,720
EQUIPMENT PURCHASE, LEASE AND/OR RENT (Item @ Cost/Hour X # of Hours X #Fiscal Years = Cost/Item): Note: Purchases require written justification that demonstrates cost benefits over leasing or renting.	

Front end loader @ \$680/day X 3 days	\$2040
Backhoe @ \$400/day x 3 days	\$1200
10 yard dump truck @ \$680 x 3 days	\$2040
JD 135 excavator or equivalent @ \$1120/day x 3 days	\$3360
	\$8640
MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item):	
Hesco Barriers @\$100/lineal foot x 150	\$15000
K-rails @ \$175 ea., delivered x 15 K-rails (Local unit unloads w/ front end loader)	\$2625
500 Sandbags @ \$1.50 ea.	\$750
100 yd ³ sand @ \$50/yd ³ , delivered	\$5000
TOTAL MATERIALS AND SUPPLY COST	\$23375
TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item):	
TOTAL TRAVEL COST	\$
CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):	
TOTAL CONTRACT COST	\$

SPECIFICATION COST SUMMARY

FISCAL YEAR	PLANNED INITIATION DATE (MM/DD/YYYY)	PLANNED COMPLETION DATE (M/D/YYYY)	WORK AGENT	UNITS	UNIT COST	PLANNED ACCOMPLISHMENTS	PLANNED COST
2017	10/1/2016	09/30/2017	F	feet	\$258	150	\$38,735

Work Agent: C=Coop Agreement, F=Force Account, G=Grantee, P=Permittees, S=Service Contract, T=Timber Sales Purchaser, V=Volunteer

SOURCE OF COST ESTIMATE

1. Estimate obtained from 2-3 independent contractual sources.	
2. Documented cost figures from similar project work obtained from local agency sources.	P, M, E, T
3. Estimate supported by cost guides from independent sources or other federal agencies	
4. Estimates based upon government wage rates and material cost.	
5. No cost estimate required - cost charged to Fire Suppression Account	

P = Personnel Services, **E** = Equipment **M** = Materials/Supplies, **T** = Travel, **C** = Contract, **F** = Suppression

RELEVANT DETAILS, MAPS AND DOCUMENTATION INCLUDED IN THIS REPORT:

See Watershed Assessment.

PART F - INDIVIDUAL TREATMENT SPECIFICATION

TREATMENT/ACTIVITY NAME	Project Administration	PART E BIA Spec #	ES-11
NFPORS TREATMENT CATEGORY*	Administration	FISCAL YEAR(S) (list each year):	2017, 2018, and 2019
NFPORS TREATMENT TYPE *	Contract Administration	WUI? Y / N	Y
IMPACTED COMMUNITIES AT RISK	Wellpinit, WA	IMPACTED T&E SPECIES	N/A

* See NFPORS Restoration & Rehabilitation module - Edit Treatment screen for applicable entries.

WORK TO BE DONE (describe or attach exact specifications of work to be done):

A. General Description: The Project Administrator will provide oversight of the Burned Area Emergency Response plan and implementation.

B. Location/(Suitable) Sites: Bureau of Indian Affairs, Spokane Reservation lands impacted by the Cayuse Mountain Fire.

C. Design/Construction Specifications:

1. Appoint, hire or contract a qualified Project Administrator. Qualifications include adequate training and/or experience in engineering, forestry, or other natural resource related fields pertinent to the emergency stabilization work to be performed.
2. In accordance with ethical guidelines set forth in federal regulations, the Project Administrator shall have no vested interest or relationship, perceived or actual, in any hiring, contracting or procurement associated with emergency stabilization work to be performed.
3. The Project Administrator will coordinate and direct the completion of all activities specified in the BAER plan, including implementation of treatment specifications and activities, preparation of commercial and self-determination contract packages, documentation of treatments installed, tracking of allocated funds and expenditures, preparation of annual and final accomplishment reports, development of supplemental requests for funding, completion of all approved treatments, and coordination with the Spokane Agency, Spokane Tribe, and other involved parties.
4. Monitor treatment effectiveness and determine need for and coordinate preparation of modifications to the BAER Plan to request and secure funding for additional treatments as determined necessary.
5. Maintain records of all implementation activities, associated costs and treatment effectiveness monitoring data including photos.

D. Purpose of Treatment Specifications (relate to damage/change caused by fire): The Project Administrator is necessary to ensure the work specified in the BAER plan is completed in a timely and professional manner, and adequate accountability of treatment effectiveness and funding expenditures is maintained and documented.

E. Treatment consistent with Agency Land Management Plan (identify which plan): Spokane Tribe Forest Management Plan.

F. Treatment Effectiveness Monitoring Proposed: The Spokane Agency and Regional BAER Coordinator will monitor Project Administrator performance to ensure specified projects are successfully completed on time and within budget, including any projects incorporated by approved plan amendments.

LABOR, MATERIALS AND OTHER COST:

PERSONNEL SERVICES: (Grade @ Cost/Hours X # Hours X # Fiscal Years = Cost/Item): Do not include contract personnel costs here (see contractor services below).	COST / ITEM
FY17 GS-11 Base Salary \$36.00/hr. X 1.4 EBC X 80 hrs./PP X 4 PP	\$ 16,128
FY18 GS-11 Base Salary \$36.36/hr. X 1.4 EBC X 80 hrs./PP X 2 PP	\$ 8,145
FY19 GS-11 Base Salary \$36.72/hr. X 1.4 EBC X 80 hrs./PP X 2 PP	\$ 8,225

TOTAL PERSONNEL SERVICE COST							\$32,498
EQUIPMENT PURCHASE, LEASE AND/OR RENT (Item @ Cost/Hour X # of Hours X #Fiscal Years = Cost/Item): Note: Purchases require written justification that demonstrates cost benefits over leasing or renting.							
TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST							
MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item):							
TOTAL MATERIALS AND SUPPLY COST							
TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item):							
FY17 Mileage \$0.51/mi. x 100 mi./day x 15 days							\$ 765
FY18 Mileage \$0.53/mi. x 100 mi./day x 10 days							\$ 530
FY19 Mileage \$0.55/mi. x 100 mi./day x 5 days							\$275
TOTAL TRAVEL COST							\$1,570
CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):							
<i>Contractor will provide all labor material, supplies, equipment, transportation, and supervision to perform project implementation in accordance with the Project Project Administrator scope of work.</i>							
TOTAL CONTRACT COST							
FISCAL YEAR	PLANNED INITIATION DATE (M/D/YYYY)	PLANNED COMPLETION DATE (M/D/YYYY)	WORK AGENT	UNITS	UNIT COST	PLANNED ACCOMPLISHMENTS	PLANNED COST
FY17	10/1/16	9/30/17	F	Implementation		1	\$ 16,893
FY18	10/1/17	9/30/18	F	Implementation		1	\$ 8,675
FY19	10/1/18	9/30/19	F	Implementation		1	\$ 8,500
TOTAL							\$34,068

Work Agent: C=Coop Agreement, F=Force Account, G=Grantee, P=Permittees, S=Service Contract, T=Timber Sales Purchaser, V=Volunteer

SOURCE OF COST ESTIMATE

1.	Estimate obtained from 2-3 independent contractual sources.	
2.	Documented cost figures from similar project work obtained from local agency sources.	T
3.	Estimate supported by cost guides from independent sources or other federal agencies	
4.	Estimates based upon government wage rates and material cost.	P
5.	No cost estimate required - cost charged to Fire Suppression Account	

P = Personnel Services, **E** = Equipment **M** = Materials/Supplies, **T** = Travel, **C** = Contract, **F** = Suppression

RELEVANT DETAILS, MAPS AND DOCUMENTATION INCLUDED IN THIS REPORT:

See Cayuse Mountain BAER Plan Assessments and Treatments Map.

PART F- INDIVIDUAL TREATMENT SPECIFICATION

TREATMENT/ACTIVITY NAME	Reforestation	PART E Spec-#	BAR-1
NFPORS TREATMENT CATEGORY*	Reforestation	FISCAL YEAR(S) (list each year):	2017, 2018,2019
NFPORS TREATMENT TYPE *	Planting	WUI? Y / N	Y
IMPACTED COMMUNITIES AT RISK	Wellpinit, WA	IMPACTED T&E SPECIES	N/A

* See NFPORS Restoration & Rehabilitation module - Edit Treatment screen for applicable entries.

WORK TO BE DONE (describe or attach exact specifications of work to be done):

<p>A. General Description: Reforest 2,082 acres of Dry Pine and 1,132 acres Pine-Fir types identified during ground reconnaissance and through GIS analysis. Sites identified for this treatment have experienced high mortality and are not expected to adequately regenerate naturally within 10 years.</p> <p>B. Location/(Suitable) Sites: See Treatment Map for location of potential reforestation areas.</p> <p>C. Design/Construction Specifications: Plant principally ponderosa pine on suitable sites. Tree species and planting spacing and methods will be tailored to the silvicultural site. Average tree spacing of 12 feet or 300 trees/acre has been used for cost estimates. Prepare annual reports documenting accomplishments and associated costs.</p> <p>D. Purpose of Treatment Specifications (relate to damage/change caused by fire): Reestablish forest cover in areas that experienced high mortality and are not expected to regenerate naturally in a reasonable period of time.</p> <p>E. Treatment consistent with Agency Land Management Plan (identify which plan): Maintain commercial forest productivity in accordance with the Spokane Tribe Forest Management Plan and Inventory Analysis 2009.</p> <p>F. Treatment Effectiveness Monitoring Proposed: Reforestation success will be monitored through stocking surveys (see specification.)</p>
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LABOR, MATERIALS AND OTHER COST:

PERSONNEL SERVICES: (Grade @ Cost/Hours X # Hours X # Fiscal Years = Cost/Item): Do not include contract personnel costs here (see contractor services below).	COST / ITEM
Contract Administration: 1 Forester @ \$40.00/hour X 8 hours/day X 30 days X 3 fiscal years	\$28,800
TOTAL PERSONNEL SERVICE COST	\$28,800
EQUIPMENT PURCHASE, LEASE AND/OR RENT (Item @ Cost/Hour X # of Hours X #Fiscal Years = Cost/Item): Note: Purchases require written justification that demonstrates cost benefits over leasing or renting.	
TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST	\$0
MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item):	
Collect and process cones and propagate seedlings:	
1,608 acres X 300 trees/acre @ \$.50/tree (2017)	\$241,200
1,608 acres X 300 trees/acre @ \$.50/tree (2018)	\$241,200
TOTAL MATERIALS AND SUPPLY COST	\$482,400
TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item):	
1 4WD Pickup @\$40/day X 30 days X 3 fiscal years	\$3,600

TOTAL TRAVEL COST	\$3,600
CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):	
Planting: 1,608 acres @ \$150/acre (FY 2018)	\$241,200
1,608 acres @ \$150/acre (FY 2019)	\$241,200
TOTAL CONTRACT COST	\$482,400

SPECIFICATION COST SUMMARY

FISCAL YEAR	PLANNED INITIATION DATE (M/D/YYYY)	PLANNED COMPLETION DATE (M/D/YYYY)	WORK AGENT	UNITS	UNIT COST	PLANNED ACCOMPLISHMENTS	PLANNED COST
2017	10/1/2016	5/30/2017	S	seedlings	\$.50	482,400	\$242,400
2018	10/1/2017	5/30/2018	S	Acre	\$307	1,573	\$483,700
2019	10/1/2018	5/30/2019	S	Acre	\$157	1,573	\$242,400
TOTAL							\$968,500

Work Agent: C=Coop Agreement, F=Force Account, G=Grantee, P=Permittees, S=Service Contract, T=Timber Sales Purchaser, V=Volunteer

SOURCE OF COST ESTIMATE

1. Estimate obtained from 2-3 independent contractual sources.	
2. Documented cost figures from similar project work obtained from local agency sources.	M, C
3. Estimate supported by cost guides from independent sources or other federal agencies	
4. Estimates based upon government wage rates and material cost.	P, T
5. No cost estimate required - cost charged to Fire Suppression Account	

P = Personnel Services, **E** = Equipment **M** = Materials/Supplies, **T** = Travel, **C** = Contract, **F** = Suppression

RELEVANT DETAILS, MAPS AND DOCUMENTATION INCLUDED IN THIS REPORT:

See Forest and Vegetation Resource Assessment and Treatment Map.
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PART F- INDIVIDUAL TREATMENT SPECIFICATION

	Stocking Surveys		BAR-2
	Monitoring		2017, 2018, 2019, 2020, 2021
	Treatment Effectiveness Monitoring		Y
	Wellpinit, WA		N/A

* See NFPORS Restoration & Rehabilitation module - Edit Treatment screen for applicable entries.

WORK TO BE DONE (describe or attach exact specifications of work to be done):

<p>A. General Description: Stocking surveys will be conducted in the fall of each year to insure target stocking levels have been met in all plantation areas. Monitoring results will form the basis for determining whether re-planting and/or seedling protection treatments are necessary.</p> <p>B. Location/(Suitable) Sites: All new plantation areas within the burn perimeter (see Treatment Map.)</p> <p>C. Design/Construction Specifications: Stocking surveys are anticipated to consist of a fixed grid of 1/50 acre sample plots at a frequency of 1 plot per acre. Surveys will record species, size and condition of both planted and naturally regenerated trees, including sprouting hardwoods particularly in riparian restoration sites. Record type and level of competing shrub and herbaceous vegetation. To the degree provided in the 5 year BAR window, survey each plantation on year 1, 3 and 5. Prepare annual reports documenting accomplishments and associated costs.</p> <p>D. Purpose of Treatment Specifications (relate to damage/change caused by fire): Verify that target stocking levels are achieved as outlined in the Forest Management Plan.</p> <p>E. Treatment consistent with Agency Land Management Plan (identify which plan): Spokane Tribe Forest Management Plan and Inventory Analysis.</p> <p>F. Treatment Effectiveness Monitoring Proposed: Stocking surveys are intended to verify whether target stocking levels are met and maintained in forest plantations.</p>

LABOR, MATERIALS AND OTHER COST:

PERSONNEL SERVICES: (Grade @ Cost/Hours X # Hours X # Fiscal Years = Cost/Item): Do not include contract personnel costs here (see contractor services below).	COST / ITEM
Contract Administration: 1 Forester @ \$40.00/hour X 8 hours/day X 20 days X 5 fiscal years	\$32,000
TOTAL PERSONNEL SERVICE COST	\$32,000
EQUIPMENT PURCHASE, LEASE AND/OR RENT (Item @ Cost/Hour X # of Hours X #Fiscal Years = Cost/Item): Note: Purchases require written justification that demonstrates cost benefits over leasing or renting.	
TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST	\$0
MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item):	
TOTAL MATERIALS AND SUPPLY COST	\$0
TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item):	

1 4WD Pickup @\$40/day X 20 days X 5 fiscal years	\$4,000
TOTAL TRAVEL COST	\$4,000
CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):	
Stocking Surveys:	
1,608 acres @ \$7.00/acre (2017)	\$11,256
1,608 acres @ \$7.00/acre (2018)	\$11,256
1,608 acres @ \$7.00/acre (2019)	\$11,256
1,608 acres @ \$7.00/acre (2020)	\$11,256
1,608 acres @ \$7.00/acre (2021)	\$11,256
TOTAL CONTRACT COST	\$56,280

SPECIFICATION COST SUMMARY

FISCAL YEAR	PLANNED INITIATION DATE (M/D/YYYY)	PLANNED COMPLETION DATE (M/D/YYYY)	WORK AGENT	UNITS	UNIT COST	PLANNED ACCOMPLISHMENTS	PLANNED COST
2017	10/1/2017	12/30/2017	S	Acre	\$11.48	1,608	\$18,456
2018	10/1/2018	12/30/2018	S	Acre	\$11.48	1,608	\$18,456
2019	10/1/2019	12/30/2019	S	Acre	\$11.48	1,608	\$18,456
2020	10/1/2020	12/30/2020	S	Acre	\$11.48	1,608	\$18,456
2021	10/1/2021	12/30/2021	S	Acre	\$11.48	1,608	\$18,456
TOTAL							\$92,280

Work Agent: C=Coop Agreement, F=Force Account, G=Grantee, P=Permittees, S=Service Contract, T=Timber Sales Purchaser, V=Volunteer

SOURCE OF COST ESTIMATE

1. Estimate obtained from 2-3 independent contractual sources.	
2. Documented cost figures from similar project work obtained from local agency sources.	C
3. Estimate supported by cost guides from independent sources or other federal agencies	
4. Estimates based upon government wage rates and material cost.	P, T
5. No cost estimate required - cost charged to Fire Suppression Account	

P = Personnel Services, E = Equipment M = Materials/Supplies, T = Travel, C = Contract, F = Suppression

RELEVANT DETAILS, MAPS AND DOCUMENTATION INCLUDED IN THIS REPORT:

See Forest and Vegetation Resource Assessment and Treatment Map.
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PART F- INDIVIDUAL TREATMENT SPECIFICATION

TREATMENT/ACTIVITY NAME	CFI Plot Reestablishment	PART E Spec-#	BAR-3
NFPORS TREATMENT CATEGORY*	Facility and Infrastructure	FISCAL YEAR(S) (list each year):	2017
NFPORS TREATMENT TYPE *	Repair Administrative Facility	WUI? Y / N	Y
IMPACTED COMMUNITIES AT RISK	Wellpinit, WA	IMPACTED T&E SPECIES	N/A

* See NFPORS Restoration & Rehabilitation module - Edit Treatment screen for applicable entries.

WORK TO BE DONE (describe or attach exact specifications of work to be done):

<p>A. General Description: Survey 92 Continuous Forest Inventory (CFI) plots on Spokane Tribal lands for damage by the Cayuse Mountain Fire. Of the 92 plots, 62 are in the high or very high mortality category and will most likely need to be re-established. The remaining 30 should be checked for damage and repaired as necessary.</p> <p>B. Location/(Suitable) Sites: Plots were all located within the burned area perimeter. The number of plots requiring reestablishment was estimated from forest mortality mapping. The actual number of plots to be reestablished will be determined through post-fire assessment.</p> <p>C. Design/Construction Specifications: Locate plots using CFI data sheets information. Assess damage to reference trees, plot center and tree tags. Reestablish plot center and tags as determined necessary. Prepare annual reports documenting accomplishments and associated costs.</p> <p>D. Purpose of Treatment Specifications (relate to damage/change caused by fire): Reestablish all damaged CFI plots to maintain inventory and growth records for commercial forest lands in the fire area.</p> <p>E. Treatment consistent with Agency Land Management Plan (identify which plan): Spokane Tribe Forest Management Plan and Inventory Analysis 2009.</p> <p>F. Treatment Effectiveness Monitoring Proposed: Forestry staff will conduct field checks to insure work quality.</p>
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LABOR, MATERIALS AND OTHER COST:

PERSONNEL SERVICES: (Grade @ Cost/Hours X # Hours X # Fiscal Years = Cost/Item): Do not include contract personnel costs here (see contractor services below).	COST / ITEM
Contract Administration: 1 Forester @ \$40.00/hour X 8 hours/day X 10 days	\$3,200
TOTAL PERSONNEL SERVICE COST	\$3,200
EQUIPMENT PURCHASE, LEASE AND/OR RENT (Item @ Cost/Hour X # of Hours X #Fiscal Years = Cost/Item): Note: Purchases require written justification that demonstrates cost benefits over leasing or renting.	
TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST	\$0
MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item):	
Plot center stakes, tags, flagging, paint, miscellaneous supplies for 62 plots @ \$15.00/plot	\$930
TOTAL MATERIALS AND SUPPLY COST	\$930
TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item):	
1 GSA 4WD Pickup @\$40/day X 10 days	\$400

TOTAL TRAVEL COST	\$400
CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):	
TOTAL CONTRACT COST	

SPECIFICATION COST SUMMARY

FISCAL YEAR	PLANNED INITIATION DATE (M/D/YYYY)	PLANNED COMPLETION DATE (M/D/YYYY)	WORK AGENT	UNITS	UNIT COST	PLANNED ACCOMPLISHMENTS	PLANNED COST
2017	10/1/2016	12/1/2016	S	Plot	\$73	62	\$4,530
TOTAL							\$4,530

Work Agent: C=Coop Agreement, F=Force Account, G=Grantee, P=Permittees, S=Service Contract, T=Timber Sales Purchaser, V=Volunteer

SOURCE OF COST ESTIMATE

1. Estimate obtained from 2-3 independent contractual sources.	
2. Documented cost figures from similar project work obtained from local agency sources.	M, C
3. Estimate supported by cost guides from independent sources or other federal agencies	
4. Estimates based upon government wage rates and material cost.	P, T
5. No cost estimate required - cost charged to Fire Suppression Account	

P = Personnel Services, **E** = Equipment **M** = Materials/Supplies, **T** = Travel, **C** = Contract, **F** = Suppression

RELEVANT DETAILS, MAPS AND DOCUMENTATION INCLUDED IN THIS REPORT:

See Cayuse Mountain BAER Plan, Forest and Vegetation Resource Assessment and Treatment Map.

PART F - INDIVIDUAL TREATMENT SPECIFICATION

TREATMENT/ACTIVITY NAME	Pit Toilet Replacement	PART E Spec-#	BAR-4
NFPORS TREATMENT CATEGORY*	Facilities and Infrastructure	FISCAL YEAR(S) (list each year):	2017
NFPORS TREATMENT TYPE *	Recreation Facilities Replacement	WUI? Y / N	Y
IMPACTED COMMUNITIES AT RISK	Wellpinit, WA	IMPACTED T&E SPECIES	N/A

WORK TO BE DONE (describe or attach exact specifications of work to be done):

<p>A. General Description: One pit Toilet in the "No Docks" recreation area burned during the Cayuse Mountain fire. The concrete pit remains and is serviceable, however the building no longer remains. This specification is to replace the building portion of the Pit Toilet.</p> <p>B. Location/(Suitable) Sites: Location at "No Docks" where the pit toilet burned.</p> <p>C. Design/Construction Specifications: 1. Clean remaining debris from Pit toilet base and prepare base for installation of new structure. 2. Construct 6'X8' plywood sided building with front door. 2X4 spacing to be 16" centers. 3. Paint building</p> <p>D. Purpose of Treatment Specifications (relate to damage/change caused by fire): Repair existing facility damaged by the fire in a recreational use area.</p> <p>E. Treatment consistent with Agency Land Management Plan (identify which plan): SIR Forest & woodland Management plan.</p> <p>F. Treatment Effectiveness Monitoring Proposed: The Implementation Team Leader will assess the implementation effectiveness</p>

LABOR, MATERIALS AND OTHER COST:

PERSONNEL SERVICES: (Grade @ Cost/Hours X # Hours X # Fiscal Years = Cost/Item): Do not include contract personnel costs here (see contractor services below).	COST / ITEM
Project Leader (GS-9 equiv. @ \$24/hr X 8hrs/day X 5 Day)	\$960
2 Crew members (GS-7 equiv. @ \$17/hr X 8 hrs/day x 5 day)	\$680
TOTAL PERSONNEL SERVICE COST	\$1,640
EQUIPMENT PURCHASE, LEASE AND/OR RENT (Item @ Cost/Hour X # of Hours X #Fiscal Years = Cost/Item): Note: Purchases require written justification that demonstrates cost benefits over leasing or renting.	
TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST	
MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item):	
2"x4"X8' Boards: 35@\$2.65/Piece	\$92
4'X8'X3/4" Plywood: 10 @ \$30/Piece	\$300
Nails: \$25/Box	25
Tar Paper: 1 roll@ \$20/roll	20
Shingles: 2 packages @ \$26/package	\$52
36" door @ \$300/Door	\$300
Paint: 2 Gallons \$30/Gallon	\$60
Toilet: 1 @ \$300/Piece	\$300
TOTAL MATERIALS AND SUPPLY COST	\$1,150
TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item):	
2 4-Wheel Drive Trucks @40/day X 5 Days	\$400
TOTAL TRAVEL COST	\$400
CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):	

TOTAL CONTRACT COST	\$

SPECIFICATION COST SUMMARY

FISCAL YEAR	PLANNED INITIATION DATE (MM/DD/YYYY)	PLANNED COMPLETION DATE (M/D/YYYY)	WORK AGENT	UNITS	UNIT COST	PLANNED ACCOMPLISHMENTS	PLANNED COST
2017	10/1/2016	11/1/2016	S	each	\$3,190	1	\$3,190
TOTAL							\$3,190

Work Agent: C=Coop Agreement, F=Force Account, G=Grantee, P=Permittees, S=Service Contract, T=Timber Sales Purchaser, V=Volunteer

SOURCE OF COST ESTIMATE

1. Estimate obtained from 2-3 independent contractual sources.	C
2. Documented cost figures from similar project work obtained from local agency sources.	P, M
3. Estimate supported by cost guides from independent sources or other federal agencies	
4. Estimates based upon government wage rates and material cost.	
5. No cost estimate required - cost charged to Fire Suppression Account	

P = Personnel Services, **E** = Equipment **M** = Materials/Supplies, **T** = Travel, **C** = Contract, **F** = Suppression

RELEVANT DETAILS, MAPS AND DOCUMENTATION INCLUDED IN THIS REPORT:

See Safety & Infrastructure Assessment
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PART F - INDIVIDUAL TREATMENT SPECIFICATION

TREATMENT/ACTIVITY NAME	Archaeological Survey of Reforestation Locations	PART E Spec-#	BAR-5
NFPORS TREATMENT CATEGORY*	Planning	FISCAL YEAR(S) (list each year):	2017
NFPORS TREATMENT TYPE *	NEPA-CATX	WUI? Y / N	Y
IMPACTED COMMUNITIES AT RISK	Wellpinit, WA	IMPACTED T&E SPECIES	N/A

* See NFPORS Restoration & Rehabilitation module - Edit Treatment screen for applicable entries.

WORK TO BE DONE (describe or attach exact specifications of work to be done):

<p>A. General Description: Approximately 3,200 acres are proposed for hand planting to re-establish forest stands impacted by the fire. As a ground-disturbing activity, this treatment will require compliance with the National Environmental Policy Act (NEPA) and Section 106 of the National Historic Preservation Act, as amended (NHPA).</p> <p>B. Location/(Suitable) Sites: See map of proposed forest planting areas.</p> <p>C. Design/Construction Specifications:</p> <ol style="list-style-type: none"> 1. Conduct pedestrian archaeological survey of 3,200 acres proposed for reforestation at an interval consistent with the Tribal Historic Preservation Office standards. 2. Identify historic properties and recommend measures to avoid or mitigate adverse effects. 3. Prepare report of findings and recommendations consistent with agency standards for meeting NHPA compliance requirements. <p>D. Purpose of Treatment Specifications (relate to damage/change caused by fire): This treatment is required to assist in agency compliance with the NEPA/NHPA in conjunction with a treatment prescribed to address fire impacts to the Tribe's commercial forest resources.</p> <p>E. Treatment consistent with Agency Land Management Plan (identify which plan): Integrated Resource Management Plan (IRMP) for the Spokane Indian Reservation, Final IRMP May 2008. Forest Management Plan for the Spokane Indian Reservation, June 2010.</p> <p>F. Treatment Effectiveness Monitoring Proposed: In the event historic properties are identified in the planting areas proposed for reforestation, an archaeologist and tribal monitor should be onsite to ensure that significant cultural values are not compromised.</p>
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LABOR, MATERIALS AND OTHER COST:

PERSONNEL SERVICES: (Grade @ Cost/Hours X # Hours X # Fiscal Years = Cost/Item): Do not include contract personnel costs here (see contractor services below).	COST / ITEM
Archaeological Survey of 3,200 acres and production of report.	\$56,075
TOTAL PERSONNEL SERVICE COST	\$56,075
EQUIPMENT PURCHASE, LEASE AND/OR RENT (Item @ Cost/Hour X # of Hours X #Fiscal Years = Cost/Item): Note: Purchases require written justification that demonstrates cost benefits over leasing or renting.	
TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST	\$0
MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item):	
TOTAL MATERIALS AND SUPPLY COST	\$0
TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item):	
Mileage - 440 miles @ \$0.585/mile X 1 Fiscal Year	\$260
TOTAL TRAVEL COST	\$260
CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):	
TOTAL CONTRACT COST	\$0

SPECIFICATION COST SUMMARY

FISCAL YEAR	PLANNED INITIATION DATE (M/D/YYYY)	PLANNED COMPLETION DATE (M/D/YYYY)	WORK AGENT	UNITS	UNIT COST	PLANNED ACCOMPLISHMENTS	PLANNED COST
FY2017	10/01/2016	12/31/2016	F	Acres	17.60	3200	\$56,335
TOTAL							\$56,335

Work Agent: C=Coop Agreement, F=Force Account, G=Grantee, P=Permittees, S=Service Contract, T=Timber Sales Purchaser, V=Volunteer

SOURCE OF COST ESTIMATE

1. Estimate obtained from 2-3 independent contractual sources.	
2. Documented cost figures from similar project work obtained from local agency sources.	P, M, T
3. Estimate supported by cost guides from independent sources or other federal agencies	
4. Estimates based upon government wage rates and material cost.	
5. No cost estimate required - cost charged to Fire Suppression Account	

P = Personnel Services, **E** = Equipment **M** = Materials/Supplies, **T** = Travel, **C** = Contract, **F** = Suppression

RELEVANT DETAILS, MAPS AND DOCUMENTATION INCLUDED IN THIS REPORT:

Map of potential reforestation locations.

BURNED AREA EMERGENCY RESPONSE PLAN

2016 CAYUSE MOUNTAIN FIRE

APPENDIX I RESOURCE ASSESSMENTS



Looking southeast towards Lake Roosevelt

1. Watershed Assessment
2. Forest and Vegetation Assessment
3. Cultural Resource Assessment
4. Fisheries Assessment
5. Public Safety Infrastructure Assessment
6. Wildlife and Range Assessment

BURNED AREA EMERGENCY RESPONSE PLAN

2016 CAYUSE MOUNTAIN FIRE

WATERSHED ASSESSMENT

I. OBJECTIVES

- Assess overall soil and watershed changes caused by the fire, particularly those that pose substantial threats to human life and property and critical natural and cultural resources. This includes evaluating changes to soil conditions, hydrologic function, and watershed response to precipitation events
- Identify potential flood and erosion source areas and sediment deposition areas
- Identify potential threats to life, property, and critical natural and cultural resources in relation to flooding, debris flows, erosion, and sediment deposition
- Develop treatment recommendations

II. ISSUES

The following issues were listed by the Spokane Tribe as watershed-related concerns to be evaluated regarding effects of the Cayuse Mountain Fire:

- Storm water runoff from river breaks and slopes effecting roads, residential areas and lakes; specifically along the Wynecoop-Cayuse Mountain Road and Bull Pasture Road, and Matthew and Benjamin lakes;
- Sedimentation of springs below Wellpinit Lookout and the concrete livestock trough;
- Sediment runoff to the Spokane Arm of Lake Roosevelt;
- Nutrient runoff to the Spokane Arm of Lake Roosevelt (see Fisheries Assessment);
- Structural impacts to the rehabilitated Sherwood Uranium Mine.

III. OBSERVATIONS

A. Background

The purpose of the burned area assessment is to determine if the fire caused emergency watershed conditions and to identify potential values at risk from these conditions. Identification of values at risk occurs through consultation with individuals, state, tribal, federal agencies as well as through field investigations. Not all values initially identified are determined to be at risk. If emergency watershed conditions are found and values at risk are identified and confirmed, then the magnitude and scope of the emergency is mapped and described, values at risk that are potentially threatened are analyzed, and treatment prescriptions are developed to protect these values, where feasible, or alternative management actions are recommended.

The most significant factor leading to emergency watershed conditions is loss of ground cover, which leads to erosion and changes in hydrologic function in the form of decreased infiltration and increased runoff. Such conditions can lead to increased flooding, debris flows, sedimentation and deterioration of soil conditions as a result of fire. Values at risk are human life and property and significant cultural and natural resources located within or downstream of the fire that may be subject to damage from flooding and hillslope erosion.

Climate

The elevations of the watersheds studied range from 1293 feet to 3130 feet. The average annual precipitation ranges from 10 – 20 inches/year with the wettest months being November, December, and January. The majority of precipitation received is in the form of snow. Summer thunderstorms of relatively high intensity rain periodically occur. Rain on snow events also occasionally occur in the watersheds of concern during winter and spring months.

Physiography, Geology and Soils

The landforms, soils and hydrology of the Tribal lands that burned are controlled by its geology which can be generalized into areas of bedrock (uplands) and areas of unconsolidated sediments (terraces). The uplands are interspersed rolling hills and low lying shallow valleys between the Huckleberry Mountains to the north and the Spokane River terraces to the south. The uplands are primarily underlain with granite (granodiorite). Soils derived from the granite formed primarily in place (disintegrating granite, or DG) as sandy and silty loams. These soils drain well, but have poor soil structure. These soils tend to be shallow and the low porosity and permeability of the underlying granite effectively perches ground water in the valley bottoms where they are intermittently wet. Ridge tops in the eastern arm of the burned area are capped with isolated Spokane Plateau remnants of Columbia River Basalt that are flanked by large, blocky talus slopes and very stony loams on steep slopes (40-60%). Cayuse Mountain and The Peaks are prominent limestone ridges that support a soil cover of gravelly loam and stony silty loam. These uplands drain directly to the Spokane River and drop off, often precipitously, onto the terraces along the river (Figure 1).

The Spokane River reach bordering the fire has four steps of river terraces that form steep bluffs of unconsolidated water-laid material – more than anywhere else along the Coulee Dam-influenced Lake Roosevelt and Spokane Arm. The terraces stand 50 to 500 feet above the river with elevations at 1360, 1640, 1700 and 1800 feet and vary in width from one-fourth mile to one and a quarter mile (Cayuse Mountain area). These terraces are eroded remnants of past hydrogeologic events that deposited till, lake and fluvial sediments associated with glaciation and ice age mega-floods. Deposits include rhythmic flood sediments with clay inter-beds overlain with flood gravels, and areas of lake beds of mud (silt) and flood-derived sands. The Spokane River valley was the main pathway for the ice age Lake Missoula floods and although the floods kept the river valley relatively sediment free, deposition occurred in eddy sites, such as behind bedrock hills, of which the terraces are remnant. Since the ice age, proportionally, the Spokane River has removed (eroded) a smaller proportion of its sediment fill than the Columbia River. Most of the terrace surfaces are covered with a veneer of aeolian (wind-blown) sand and silt (loess), which makes the area so dusty. Edges of the higher terraces are locally buttressed along the shoreline by alluvial fans, alluvial slopes, and the 1360 terrace. Soil moisture varies depending on particle size, but are generally well drained. Terrace deposits are highly erosive and the bluffs are subject to landslides due to undermining of the toes from reservoir drawdowns of Lake Roosevelt.

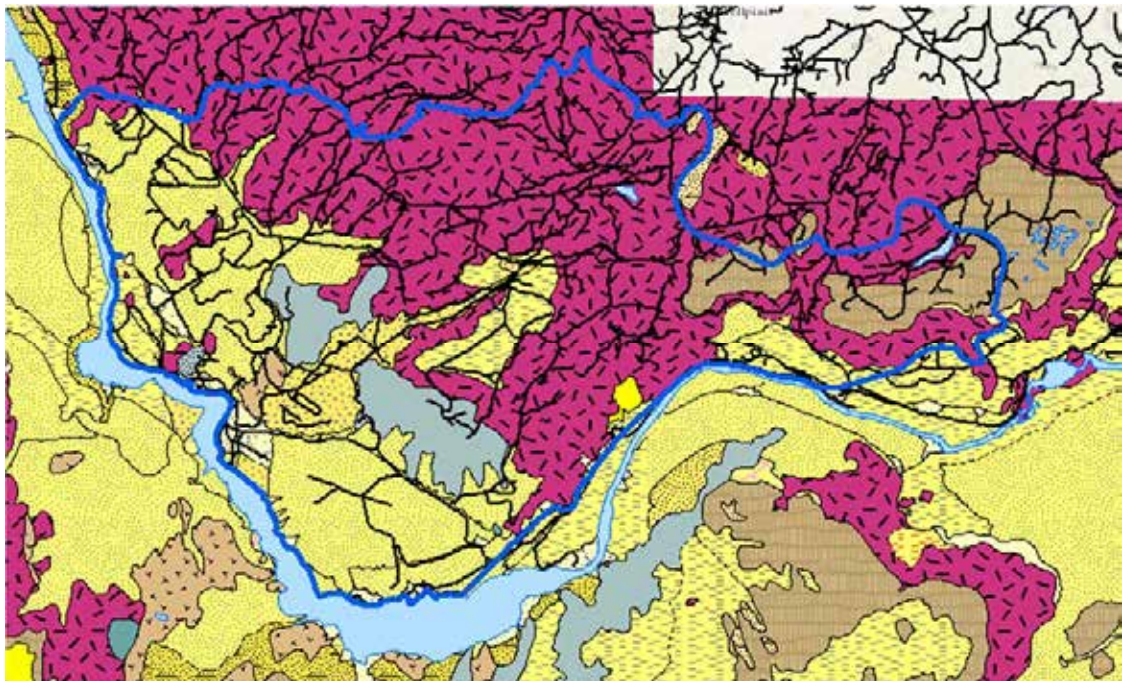


Figure 1. General geology of the Cayuse Fire area. Granite uplands (red); ridge tops capped with Columbia River Basalt (tan); limestone of Cayuse Mountain and The Peaks (grey); unconsolidated sediments (yellow); fire perimeter (blue); roads (black). Base topography may be seen on the Little Falls quadrangle and the Turtle Lake 15-minute quadrangle. Compare with Elevation map in the appendix for upland / terrace physiography.

Watershed Response

The primary watershed responses from the effects of the Cayuse Mountain Fire are expected to include: 1) initial flush of ash with normal precipitation; 2) gully and rill erosion on steep slopes in drainages with moderate and high soil burn severity with normal precipitation; and 3) increases in winter storm runoff. Elevated soil erosion, sedimentation, runoff, and stream flows are expected to decrease rapidly after the first year and return to the natural hydrological watershed function in five to seven years after the fire after vegetation has sufficiently recovered to restore the surface soil-hydrologic function and processes within the watersheds that burned at moderate and high severity. It should also be noted that there may be an increase in hillslope failures due to the decay of roots of the fire killed trees as long as 8 to 12 years after the wildfire. This root decay (peaks from 8 to 12 years following tree fatality) and leads to a loss of soil strength.

Overland flow occurs as a result of rainfall that exceeds soil infiltration capacity and the storage capacity of depressions. On the unburned forest floor, overland flow often doesn't occur at all and when it does it follows a myriad of interlinking flow paths that constantly change as organic material (litter and duff layers) and inorganic material (rock) are encountered (Huggins and Burney, 1982). Consumption of the forest floor by fire alters the path of overland flow by reducing the overall length of the flow path, resulting in the concentration of flow into a shorter flow path. This concentration of overland flow increases the hydraulic energy of the flow and can result in rill erosion. At the watershed scale, the reduction of hillslope flow path lengths and the formation of rills that have a high water conveyance capacity reduce the times of concentration or the amount of time for overland flow to reach a defined point within the watershed.

Overland flow is also increased if there is an increase in water repellency (hydrophobicity) of the soils because of the fire. This can reduce infiltration and increase overland flow (runoff) (DeBano et al., 1967). Infiltration curves for water repellent soils reflect increasing wettability over time once the soil is placed in contact with water. Water repellency decreases (hence infiltration increases) with time as the substances responsible for hydrophobicity begin to break down, thereby increasing wettability. In general, fire-induced hydrophobicity is broken up or is sufficiently washed away within one to two years after a fire (Robichaud, 2000). The thicker and deeper the water repellent layer, the longer it will take to dissipate. Also, as noted above, many of the soils in these vegetation communities are water repellent prior to the fire (i.e.: not fire-induced), and in these cases the water repellency will likely persist. However, once soil cover and vegetative canopy begin to recover, this persistent water repellency becomes less significant to the runoff response since the litter and canopy quickly restore protection of soil and obstruction of overland flow, thus enhancing infiltration and reducing energy for runoff and erosion.

Raindrops striking exposed mineral soil with sufficient force can dislodge soil particles. This is known as splash erosion. These dislodged particles can fill in and seal pores in the soil thereby reducing infiltration. Further, once soil particles are detached by splash erosion they are more easily transported in overland flow. Surface erosion is defined as the movement of individual soil particles by a force (wind, water, or gravity), and is initiated by the planar removal of material from the soil surface (sheet erosion) or by concentrated removal of material in a downslope direction (rill erosion). Surface erosion is a function of four factors: 1) susceptibility of the soil to detachment, 2) magnitude of external forces (raindrop impact or overland flow), 3) the amount of protection available by material that reduces the magnitude of the external force (soil cover), and 4) management practices that can reduce erosion (Foster, 1982; Megahan, 1986).

B. Reconnaissance Methods and Results

Burned area evaluations included:

- Identifying fire-caused changes in soil properties and hydrologic function;
- Determining spatial extent and strength of hydrophobic soil conditions;
- Determining post-fire infiltration rates;
- Mapping soil burn severity;
- Identifying sediment source areas and erosion potential;
- Determining current channel and culvert capacities;
- Identifying potential flood zones; and
- Identifying potential threats to human life, property, and critical natural and cultural resources (values at risk).

The DOI BAER Team watershed specialists conducted field visits to review resource conditions after the fire from September 1 through September 4, 2016. The main objectives of the field visits were to 1) evaluate soil burn severity and watershed response in order to identify potential flood

and erosion source areas as well as debris flow hazards; 2) identify and inventory values at risk, 3) identify the physical and biological mechanisms that are creating risks; 4) review channel morphology and riparian conditions; 5) inspect hillslope conditions; 6) inspect road conditions; and 7) determine needs for emergency stabilization.

Field observations were compared with satellite imagery gathered after the fire, including color infrared and burned area reflectance classification. Additionally, an aerial reconnaissance flight was conducted to observe watershed conditions and issues on Spokane Indian Reservation lands.

Soil Burn Severity

Soil burn severity mapping is intended to reflect the degree of effects caused by the fire to soil characteristics that affect soil health and hydrologic function, hence erosion rate, and runoff potential. It is not a map of vegetation consumption. In mapping soil burn severity, the team evaluated field-observable parameters such as the amount and condition of surface litter and duff remaining, soil aggregate stability, amount and condition of fine and very fine roots remaining, and surface infiltration rate (water repellency) (Table 1). Water repellency was evaluated by observing the length of time a water drop remained beaded on the soil. If water repellency was present, the depth and thickness of this water repellent layer was also measured. Ash and soil color may also indicate how intense the heat was and how long it remained at a given place (residence time). These parameters are compared to similar soils under unburned conditions to estimate the degree of change caused by the fire.

Table 1. General characteristics of the soil burn severity classes.

Soil Burn Severity	Characteristics
Unburned to Very Low	Unburned islands within the fire perimeter, and areas where very low severity ground fire occurred. Vegetation canopy, ground cover, and soil characteristics are not altered significantly from pre-fire conditions. A thin water repellent layer may occur throughout these areas.
Low	Shrub canopy and grasses may be scorched or consumed. Unburned and charred, but recognizable, grasses and shrub litter are present at the surface. A moderate, thin water repellent layer may be present at the ash-soil interface, under or near vegetation clumps. The water repellent layer is discontinuous and may not be fire-induced. Little to no water repellency observed between vegetation clumps. There were unburned patches of bare ground between shrubs. In forested areas, light ground fire may have occurred but litter and duff remain largely intact and forest canopy is generally unaffected.
Moderate	In chaparral areas, shrub canopy is consumed, with stobs and stems remaining. Unburned and recognizable charred leaf litter and twigs remain beneath the ash in shrub areas; a moderate, thin water repellent layer may be present but discontinuous under trees and shrubs. In forest areas, leaf litter and fine surface fuels may be consumed, but conifer or hardwood canopy is scorched but not consumed and will soon become soil cover/mulch. Unburned patches between shrubs and trees are smaller but still present.
High	Generally areas where tree canopy and shrub cover was dense (greater than 60-80%) and pre-fire litter layer was deeper and more continuous. Some charred, but recognizable organic material may be present in or beneath a thick ash layer. Water repellency may be present, but is also present under unburned hardwood shrub litter and may not be fire-exacerbated.

While soil burn severity is not based primarily on fire effects to vegetation, the team used post-fire vegetative condition as one of the visual indicators in assessing soil burn severity. In some cases there may be complete consumption of vegetation by fire, with little effect on soil properties, such as in a shrub ecosystem. Denser vegetation, with a deeper litter and duff layer, results in longer heat residence time, hence more severe effects on soil properties. For example, deep ash after a fire usually indicates a deeper litter and duff layer prior to the fire, which generally supports longer residence times. This promotes loss of soil organic cover and organic matter which are important

for erosion resistance, and the formation or exacerbation of water repellent layers at or near the soil surface. The results are increased potential for runoff and soil particle detachment and transport by water, wind, and gravity. This would be mapped as high soil burn severity.

Conversely, sparse or light pre-fire vegetation such as grasses or sparse shrubs usually have negligible litter layer and surface fuels and experience extremely rapid consumption and spread rates, with very little heat residence time at the soil surface. The result is very little alteration of soil organic matter and little or no change in soil structural stability. Water repellency, usually present under shrubs before the fire, may or may not be exacerbated by the fire. Areas between shrubs or grass crowns usually had very little fuel to burn, thus only experienced brief radiant heat as the flashy grasses and sparse shrubs burned. In these cases, soil burn severity would be low.

In between these extremes, the moderate class of soil burn severity is far more diverse in observed soil conditions and can include various vegetation types, ranging from forests to shrub communities. In the case of a forest, the litter layer may be largely consumed, but scorched needles and leaves remain in the canopy and will rapidly become mulch. This is important in re-establishing protective ground cover and soil organic matter. This factor can result in the classification of the area as moderate, rather than high. Generally, however, there will also be less destruction of soil organic matter, roots, and structure in an area mapped as moderate. In a shrub ecosystem, even where pre-fire canopy density was high, litter layer is generally thin, and while the shrub canopy may have been completely consumed by the fire, the soil structure, roots, and litter layer may remain intact beneath a thin ash layer. Above ground indicators such as size of unconsumed twigs remaining to help the team determine how long the heat may have persisted on the site. If only root stobs and large diameter twigs remain, it was likely a more intense fire with longer heat residence time, and combined with other observations of soil conditions may result in a call of high soil burn severity.

Soil burn severity was mapped by field reconnaissance, observation, and soil testing in representative locations on the Spokane Indian Reservation. Color infrared satellite imagery of the burned area was also utilized to map areas of low, moderate, high soil burn severity and unburned areas.

Table 2. Soil Burn Severity Summary

Cayuse Mountain Fire Total		
Burn Severity	Acres of Burn Severity	% of Burned Area
Unburned / Very Low	3920	22%
Low	8586	47%
Moderate	5127	28%
High	453	3%
Total	18,068	100%

Sherwood Mountain Watershed		
Burn Severity	Acres of Burn Severity	% of Burned Area
Unburned	1332	58%
Low	690	30%
Moderate	266	12%
High	2	0%
Total	2291	100%

Flett-Raymond Watershed		
Burn Severity	Acres of Burn Severity	% of Burned Area
Unburned	1940	54%
Low	1133	31%
Moderate	500	14%
High	41	1%

Total	3614	100%
Chief Watershed		
Burn Severity	Acres of Burn Severity	% of Burned Area
Unburned	27	6%
Low	148	31%
Moderate	278	59%
High	22	4%
Total	475	100%

Payne Watershed		
Burn Severity	Acres of Burn Severity	% of Burned Area
Unburned	11	0%
Low	3279	38%
Moderate	5200	60%
High	233	3%
Total	8723	100%

Cayuse Mountain Watershed		
Burn Severity	Acres of Burn Severity	% of Burned Area
Unburned	529	16%
Low	1408	43%
Moderate	1104	34%
High	248	7%
Total	3289	100%

Prospect Watershed		
Burn Severity	Acres of Burn Severity	% of Burned Area
Unburned	708	20%
Low	1107	28%
Moderate	1740	49%
High	125	3%
Total	35803676	100%

Wellpinit Mountain Watershed		
Burn Severity	Acres of Burn Severity	% of Burned Area
Unburned	1994	72%
Low	530	19%
Moderate	250	9%
High	8	0%

Total	27822	100%
Mine Watershed		
Burn Severity	Acres of Burn Severity	% of Burned Area
Unburned	897	67%
Low	302	23%
Moderate	139	10%
High	0	0%
Total	1338	100%

AGWA Modeling

Post-fire watershed response was calculated using a variety of different methods in order to average the expected response to match professional judgment and field observations. The Automated Geospatial Watershed Assessment tool (AGWA) was used to model several watersheds draining into the Spokane Arm of Lake Roosevelt from the fire area. AGWA is a geospatial (GIS) watershed modeling application which operates using a Digital Elevation Model (DEM) to delineate the watershed, and then intersects with soil, land-use/cover, and precipitation (uniform or distributed) to derive the requisite model input parameters (Goodrich et al, 2005). AGWA is designed to provide qualitative estimates of runoff and erosion relative to landscape change. It cannot provide reliable quantitative estimates of runoff and erosion in the scope of this rapid emergency response assessment. It is also subject to the assumptions and limitations of its component models (Goodrich et al, 2005). Model results are included in the Appendix, AGWA Model Outputs.

We chose to select a design storm duration that allows the entire watershed to be contributing to the outlet in the AGWA rainfall/runoff modeling. This storm was a 10 year event with a 1 hour duration producing 0.6 inches of precipitation. If a design storm duration is too short, flows generated in the lower part of the watershed will have passed the point of interest before flows from more distant parts of the watershed are seen at the outlet. Rather, we want flows from all parts of the watershed to compound at the outlet to achieve a conservative (high end) estimate of watershed response.

C. Findings

Soil Burn Severity (SBS)

Soil testing in the field was conducted in areas of high, moderate, and low soil burn severity within the Cayuse Mountain Fire. Unburned soils in comparable vegetation, elevation, and aspect areas near or within the Cayuse Mountain Fire were also tested to calibrate soil tests conducted in burned soils. Minor hydrophobicity was observed in soils with high and moderate burn severity at depths ranging from 0 inch (on top of the mineral soil surface) to 0.25 inch deep. Unburned soils exhibited no hydrophobicity.

Watershed Response

Across the Cayuse Mountain Fire the following observations were made regarding post-fire watershed conditions:

- 1) The majority of the lands burned were in the Low and Moderate SBS classes
- 2) Very little fire-induced hydrophobicity (water repellency) was found throughout the fire.
- 3) Surface roughness (micro-depressions, rock fragments, unburned areas, litter) were observed in many areas, which will help catch and detain rainfall which will aid infiltration and mitigate erosion potential increase in runoff potential.
- 4) On steeper burned slopes, loss of ground vegetation and litter will allow perched sediments and surface debris to more easily dry ravel.

- 5) The primary watershed responses from the effects of the fires are expected to include an initial flush of ash and sediment with normal precipitation.
- 6) Flooding and debris flows may be initiated by higher intensity precipitation events with sediment deposition where stream gradients flatten and/or at tributary mouths.
- 7) The chance of elevated soil erosion, sedimentation, runoff, and stream flows are expected to decrease significantly after the first growing season as a result of natural vegetative recovery in the areas burned at low to moderate soil burn severity.
- 8) Return to the natural hydrologic watershed conditions is probable in three to five years after the fire as a result of natural vegetative recovery in the areas burned at low to moderate soil burn severity.

AGWA Watershed Modeling

The following tables summarize the results of the AGWA modeling runs to determine potential post-fire increases in stream flow and sediment yields.

Watersheds modeled using AGWA:

Fire Acres for Watershed	Total Acres	Burned Acres	Percent of Watershed Burned
Sherwood Mountain Watershed	2291	959	42%
Flett-Raymond Watershed	3614	1674	46%
Chief Watershed	475	448	94%
Cayuse Mountain Watershed	32894	2761	84%
Prospect Watershed	3580	2872	80%
Wellpinit Mountain Watershed	2782	789	28%
Mine Watershed	1338	442	33%

AGWA model results: Percent change in peak flows of streams and sediment yield comparing pre-fire conditions with post-fire conditions, using a 10-year, 1-hour, 0.6-inch rain storm.

Watershed	Post-Fire Peak Flow % Increase	Post-Fire Sediment Yield % Increase
Sherwood Mountain Watershed	317%	461%
Flett-Raymond Watershed	305%	19%%
Chief Watershed	4,315%	5,754%
Cayuse Mountain Watershed	869%	930%%
Prospect Watershed	1,442%	3,352%
Wellpinit Mountain Watershed	106%	49%
Mine Watershed	88%	366%

Sherwood Mountain

AGWA results for the Sherwood Mountain watershed are summarized in the above tables and indicate a slight change in peak flow and sediment yield could be expected. This change is associated with the watershed response of a sub-watershed that contains moderate soil burn severity. This sub-watershed is expected to respond with a 623 to 778 percent increase over pre-fire conditions. The increase in peak stream flow and associated hillslope erosion would result in continued sediment delivery deposited onto the Wynecoop-Cayuse Mountain Road and potentially into the Spokane Arm of Lake Roosevelt.

Flett-Raymond

AGWA results for the Flett-Raymond watershed are summarized in the above tables and indicate a slight change in peak flow and relatively minor change in sediment yield could be expected. This change in peak flow is associated with the watershed response of two small sub-watersheds located in the upper portion of the watershed that contains moderate and high soil burn severity. These sub-watersheds are expected to respond with a 1,347 to 1,683 percent increase over pre-fire conditions. The increase in peak stream flow and associated hillslope erosion would result in continued sediment delivery deposited onto the Wynecoop-Cayuse Mountain Road, residences at the outlet of the watershed and potentially into Spokane Arm of Lake Roosevelt.

Chief

AGWA results for the Chief watershed are summarized in the above tables and indicate a significant change in peak flow and sediment yield could be expected. This change in peak flow is associated with the watershed response of the upper portion of the watershed that contains moderate and high soil burn severity totaling 63% of the area. This is a small watershed of 475 acres of which 94% burned. The upper sub-watersheds are expected to respond with a 4,813 to 5,922 percent increase over pre-fire conditions. The increase in peak stream flow and associated hillslope erosion would result in continued sediment delivery deposited onto the Wynecoop-Cayuse Mountain Road, which can impact ingress/egress to residences located along this road, and into the Spokane Arm of Lake Roosevelt.

Cayuse Mountain

AGWA results for the Cayuse Mountain watershed are summarized in the above tables and indicate a moderate change in peak flow and sediment yield could be expected. This change in peak flow is associated with the watershed response of the upper portion of the watershed that contains moderate and high soil burn severity totaling 41% of the area. The upper sub-watersheds are expected to respond with a 9,294 to 15,388 percent increase over pre-fire conditions. The increase in peak stream flow and associated hillslope erosion would result in continued sediment delivery deposited onto the Bull Pasture Road, which can impact ingress/egress to recreational sites at Jackson Cove and into the Spokane Arm of Lake Roosevelt.

Prospect

AGWA results for the Prospect watershed are summarized in the above tables and indicate a significant change in peak flow and sediment yield could be expected. This change in peak flow is associated with the watershed response of the lower and middle portion of the watershed that contains moderate and high soil burn severity totaling 52% of the area. The upper sub-watersheds are expected to respond with a 9,294 to 15,388 percent increase over pre-fire conditions. The increase in peak stream flow and associated hillslope erosion would result in continued sediment delivery deposited onto the Bull Pasture Road, which can impact ingress/egress to residences and recreational sites at Jackson Cove and into the Spokane Arm of Lake Roosevelt.

Wellpinit

AGWA results for the Wellpinit watershed are summarized in the above tables and indicate a slight change in peak flow and sediment yield could be expected. This change in peak flow is associated with the watershed response of the lower portion of the watershed that contains moderate soil burn severity. The lower sub-watersheds are expected to respond with a 98 to 244 percent increase over pre-fire conditions. The increase in peak stream flow and associated hillslope erosion would result in continued sediment delivery deposited onto the Sherwood Mine Road and into the Spokane Arm of Lake Roosevelt.

Mine

AGWA results for the Mine watershed are summarized in the above tables and indicate a slight change in peak flow and sediment yield could be expected. This change in peak flow is associated with the watershed response of the lower portion of the watershed that contains moderate soil burn severity. The lower sub-watersheds are expected to respond with a 540 to 1,348 percent increase over pre-fire conditions. The increase in peak stream flow and associated hillslope erosion would result in continued sediment delivery deposited onto the Sherwood Mine Road and into the Spokane Arm of Lake Roosevelt.

Values at Risk

Values at risk are human life and property, and critical natural and cultural resources located within or downstream of the fire that may be subject to damage from flooding, ash, mud and debris deposition, and hillslope erosion.

Watershed issues of concern at risk of threat from flash flooding and/or debris flow listed by the Spokane Tribe were evaluated, and values at risk within Spokane Indian Reservation lands identified in this rapid watershed assessment were:

- Human life and safety within and downstream of the burned area
- Integrity of Wellpinit-Little Falls Road within the burned area
- Integrity of rural residential and recreation sites and access roads within and downstream of the burned area
- Integrity of stream channel functionality due to sediment loading and debris filling with floatable woody debris (logs) and refuse disposed in and adjacent to channels (i.e. old appliances, barrels, vehicles and car parts, pulled metal culverts) that could plug culverts or create in-channel debris jams

The following were found to not be issues of concern regarding changes in watershed conditions as a result of the Cayuse Mountain Fire:

- reclaimed Sherwood uranium mine
- safety concerns associated with abandoned mine lands

IV. RECOMMENDATIONS

A. Emergency Stabilization

Hazard Warning Signs: ES 1

Burned area warning and flood hazard warning signs will provide notice to the public of dangers on the road that have changed as a result of the fire. Burned area signs consist of a warning to the public and identifying the possible dangers associated with a burned area. Flood hazard signs warn the public that they are entering an area prone to flooding during rain events. The signs shall contain language specifying issues to be aware of when entering a burned area such as falling trees and limbs, rolling rocks, and flash floods.

Storm Patrol: ES 2

Road patrols will evaluate the condition of roads for motorized access and to identify and implement additional work needed to maintain and/or repair damaged road surfaces and flow conveyance structures across roads in order to provide safe access across Spokane Indian Reservation lands. Engineering / roads personnel will survey the roads within the fire perimeter after significant rain storms and snow-melt. Surveys will inspect road surface condition, ditch erosion / sedimentation, and culverts/inlet basins for capacity to accommodate runoff flows, sediment and floatable debris. Clearing of rock and sediment debris from roadways and cleaning of culverts as necessary should be performed to provide for safe travel and protect road infrastructure, as increased runoff is expected from the burned area.

Floatable Debris and Hazardous Material Assessment: ES 3

A discarded debris and hazardous materials assessment will quantify the amount of materials in stream channels that should be removed. Staff will locate the materials and create specifications and cost estimates for their removal which will be submitted for supplemental BAER funds. With increased flows expected in the burned watersheds, these materials could mobilize during a flood event, be transported downstream, and potentially impact public safety and/or water quality of the Spokane River arm of Lake Roosevelt. Removing these materials prevent additional downstream hazards and impacts.

Structure Protection: ES 10

Approximately 150 linear feet of Hesco™ structures will be installed upstream of the residence at the outlet of the Flett-Raymond Watershed along Wynecoop-Cayuse Road. The purpose of these

structures is to prevent flooding of the home and property during small runoff events and/or winter snowmelt. It is not intended to protect life. Nor is it intended to protect the residence from a larger runoff event. The Hesco™ structures are only intended to be used as a temporary structure protection measure while waiting for the NRCS to conduct a site-specific assessment. From the assessment, the NRCS can then make a determination of site defensibility. Based on the determination, then an engineered robust protection measure can be designed through their Emergency Watershed Protection (EWP) program, which is to be requested by the Tribe. If no defensive measure can be designed to provide adequate protection, then a determination will need to be made whether or not to leave the temporary Hesco™ treatment in place. These temporary structures should not be considered as a life protection measure as a larger debris flow event could still pose a risk to the life and safety of the occupants if it overtops the Hesco™ structures. Please see the non-specification management recommendation section for the life-protection measures for this residence.

B. Non-Specification Management Recommendations

Life-threatening hazards at residences on Flett-Raymond alluvial fan

Based on field reconnaissance, the home sites on the alluvial fan exiting Flett-Raymond Canyon were identified as being at risk of post-fire debris flows from the Cayuse Mountain Fire. This residence is located on the Wynecoop-Cayuse Mountain Road, approximately 2 miles west of the turn off from Wellpinit-Little Falls Road and just west of the boat ramp. There is a spring-fed perennial stream that runs past the residence in an incised channel. The residence sits approximately 15 feet above the bottom of the stream channel. There is another home, just to the east, that could also be impacted in a big event.

The watershed contributing to this outlet is approximately 5 square miles. The top of the watershed is the southeast facing slope of Wellpinit Mountain, which is mostly unburned or low burn severity with some small patches of moderate burn severity. Most runoff in the upper watershed appears to go subsurface as the terrain flattens out into a wide shallow valley that contains Benjamin Lake, farm land, and marshy areas (Flett Flats). This portion of the watershed is mostly unburned or very low burn severity. Surface flow from this area, likely only during large storm events or spring snowmelt, does begin to concentrate into small ephemeral channels and eventually drops into the steep portion of the lower watershed (Flett-Raymond Canyon).

The area of concern is the lower portion of the watershed, immediately upstream of the residence, where the stream channel passes through a narrow and deep valley (Flett-Raymond Canyon). This area is approximately 0.5 square miles and has very steep side slopes. There are springs in this portion of the watershed that provides stream flow year round. The steep slopes are timbered and experienced moderate to high burn intensity that left little to no ground cover and consumed much of the needle canopy of the trees.

The soils in the area are very thin and the slopes are very rocky with decomposed granite that shows signs of dry raveling and/or water-caused movement of large rocks down the slopes and into the stream channel. The loose rock and boulders on the slopes and in the stream channel could be mobilized in a flood event. Due to the long steep slopes, loose rock, and intensity of burn, this is an area that may produce a damaging debris flow if it received intense rainfall in a thunderstorm. Additionally, tree mortality in the area is high and will provide large woody debris (logs) on the slopes and into the stream channel which will increase the potential for log jams to form and/or travel downstream during a flood. There is already evidence of the burned trees falling into the stream channel. U.S. Geological Survey (USGS) completed a debris flow prediction model that indicated a 50% chance of debris flows coming from the steep slopes just upstream of the house in a 10-yr 1-hr event (approximately 0.6" rainfall in 1 hour). The probability of debris flows increase with additional rain and there is an 80-90% likelihood of a debris flow with 1" of rainfall in 1 hour. While not all debris flows are large and/or life threatening, the potential does exist for a damaging event.

The lower part of the canyon becomes a narrow constriction before emerging onto a small alluvial fan (Flett-Raymond Canyon Fan) a short distance above the residence. The channel follows the west edge of the fan where it is further confined by a wall of bedrock. The house sits just a few meters from the creek on the other side. If a debris flow or large flood event is produced in this drainage and it jumps out of the channel due to excessive flow or due to the channel becoming clogged with sediment or debris (logs, boulders) and subsequently blowing out, then the house and a nearby single-wide trailer home may be impacted, placing the occupants and any guests in the homes or yards in grave danger. This potential hazard is further increased by the short amount of time it would take for a flash flood or debris flow from the burned area to reach the alluvial fan. Depending on how far up the watershed a debris flow starts, it can be as little as 5 to 20 minutes from the time intense rainfall starts to when a debris flow impacts the residences. Due to the potential force and velocity of a flash flood or debris flow emerging from this drainage, and the proximity of the homes to the head of the alluvial fan and active stream channel, there is a low level of certainty whether constructed flood mitigation treatments in such a confined area would provide sufficient protection.

The team is recommending a temporary structure protection to protect against minor run off events until a more thorough site-specific solution and plan can be developed. This temporary structure protection should not be considered a life safety protection measure against debris flows. Refer to ES 11 specification and recommendations below.

Recommendation options include:

- (1) Tribe request an NRCS site-specific assessment and mitigation measures under the Emergency Watershed Protection (EWP) program. While waiting for the EWP program to determine site defensibility and whether they can engineer a more robust life safety protection measure, the ES-11 specification will provide some level of flood protection to the residential structure from minor events.
- (2) Move the house, and possibly the adjacent trailer, to higher ground that is not susceptible to damaging floods and debris flows.
- (3) Develop a plan to monitor the local weather forecasts on a frequent basis and vacate the premises in advance of potential flood-producing weather patterns (thunderstorms, significant fall/winter/spring rain events, rain-on-snow, large snowmelt events).
- (4) Monitor the stream channel in the canyon above the residence for developing log jams or debris dams that could impound water and give way releasing a large flood and sediment flow.

Whether a home has flood mitigation installed or not, early flood warning systems and/or procedures are often considered in post-fire flood situations but are problematic at this location due to the short distance between the flood-producing portion of the watershed and the home(s) below. If a storm is detected over the burned area (by rain gages, stream gages, Doppler weather radar, or volunteer weather spotters), there would likely not be enough time to issue a warning and have the residents evacuate before the flash flood or debris flow arrived.

Some areas of the U.S. set up systems that base emergency notification or warnings on when thunderstorms are moving towards the area. However, most thunderstorms in the Inland Northwest tend to be smaller in size and often have a shorter lifespan than their counterparts in other parts of the country. As such, the predictability of thunderstorms in this area is usually less certain than for east of the Rockies. Even when a storm has developed and is being tracked on Doppler weather radar, the predictability of that storm maintaining its track and strength is low. Thus, warning for a burn-scarred area based on nearby thunderstorms could cause a high number of false alarm notifications/warnings. If evacuation actions are taken for one or more false alarms, it would likely lead to an inclination of the residents to dismiss future warnings (“the boy who cried wolf” phenomenon).

Relying on emergency notification for evacuation in advance of a flash flood or debris flow presents some other issues that need to be considered. Local entities could institute a storm monitoring program with volunteers that could monitor rainfall in the watershed and communicate via phone or radio to the residents below, or by whatever reverse 911 system the Spokane Tribe or Stevens County Emergency Management has in place. If the National Weather Service issues Flash Flood

Warnings based on Doppler weather radar information or weather spotter reports, it would need to be determined how this message will be received by the residents. If there is good NOAA Weather Radio (NWR) coverage and the residence has a NWR, a Flash Flood Warning that is issued will activate the Emergency Alert System (EAS) which then automatically turns on the NWR, which will alarm and broadcast the warning. This same EAS Flash Flood Warning would also be broadcast over most local TV and radio stations. The new Wireless Emergency Alert (WEA) system alarms on newer cell phones if a Flash Flood Warning is issued, but in an area with inconsistent cell coverage it is not recommended that WEA be relied on to receive these warnings. WEA functionality also would require the residents to have newer smart phones on which WEA is enabled. This discussion of emergency notification options is for information only, as the team does not recommend this approach for life and safety protection at this location.

Because of the challenges of evacuating in time based on warnings during or just before a flood event, another option is for the Tribe, working with the residents and other cooperating agencies, to develop a plan for temporarily evacuating residents in advance of forecast storms. The plan would need to include monitoring the local weather forecasts for potential flood-causing weather patterns (thunderstorms, large fall/winter/spring rain events, rain-on-snow events, and large snowmelt events), and a pre-arranged place for residents to stay when potential flood-causing weather patterns are forecast. While this will not guarantee that the property or homes will be safe from flooding or debris flows, it does minimize the risk to human life. If this is the preferred option, it would require that the residents have bags packed and ready to leave based on weather forecasts. Offsite storage of important documents and personal items should be considered until the watershed heals and the risk is diminished (the "7 Ps" – people, pets, personal computers, prescriptions, pistols, important papers, family pictures).

Life-threatening hazards at residences in Sherwood Mountain drainage

Another location of note is a burned home site located just west of Wellpinit-Little Falls Rd and just south southwest of the lower switchback along this road. The burned home site is situated along an ephemeral stream channel below a burned drainage with steep side slopes. There is earthen fill partially blocking the channel at its narrowest point, and a house was situated on a small bench just above this point. A flood or debris flow coming down the channel could potentially jump out of its banks at this location and impact any structures that may be rebuilt there.

Recommendation:

If the home is rebuilt in the same location, then the Tribe should request an NRCS site-specific assessment under the Emergency Watershed Protection (EWP) program. Additionally, the channel should be cleared of any earthen fill and floatable debris in order to increase channel conveyance (i.e.; make room for the channel to pass the large floods) until the watershed recovers.

Hydrogeologic events at Payne Ranch

An unnamed ephemeral drainage which we shall refer to as the Chief watershed wraps around the northeast side of a broad alluvial fan-terrace before flowing in the Spokane River. This channel is deeply incised through the unconsolidated terrace sediments and does not pose a substantial risk to the properties above it. It does pose a risk, though, to the Wynecoop-Cayuse Mountain Road crossing, which is addressed in the management specification for storm patrols.

A short (~0.25 mile long), steep (800-foot elevation drop) unnamed ephemeral channel, immediately adjacent and to the west of the Chief watershed, drains the rocky escarpment above Payne Ranch near the northwest corner of the alluvial fan-terrace. Site evidence indicates that small debris flows have occurred in the past. Where runoff emerges onto the fan bedload has dropped out on both sides of the runout as the flow lost its energy. Hence, a paired cobble to small boulder berm has created a perched (not incised) channel for a few dozen meters on the fan that will direct future low flow runoff towards the west side of the fan-terrace. This is away from structures and towards livestock pastures. Large runoff events and/or debris flows will not be contained by these berms and may overtop them at the break in slope between the escarpment and fan, resulting in flowing farther and straighter out into the pasture. A gentle, shallow, broad

swale nearly perpendicular to this runout path should intercept flow and deflect it away from the house and keep to the pasture. Since the catchment is very narrow it would take a significant storm directly over it to create enough runoff with the power to mobilize debris very far onto the fan-terrace. Structures are centrally located on the fan-terrace and not close to the drainage coming off the escarpment. Most flow events should lose their debris transport power in the upper pasture.

Recommendation:

Even a small debris flow can be a powerful life-threatening event. It is recommended that attention be given to weather forecasts and livestock moved early to pastures away from the potential runout area. It is also recommended that people and pets stay away from the drainage and runout area until well after a storm passes as events often have a post-rainfall lag time. It is not wise to venture out to see if a debris flow will occur so you can see it happen. Wait until later and look for any results.

Jackson Cove / No Docks Recreation Area

A large watershed that includes the north face of Cayuse Mountain outlets into Jackson Cove in the Spokane Arm of Lake Roosevelt at a recreational area referred to as "No Docks". This drainage is being called "Cayuse Mountain." This watershed has experienced flood events in the recent past (pre-fire) that have transported large amounts of sediment downstream and washed out the road (Bull Pasture Road) that runs along the drainage. The most recent event in May washed the road out at 2 separate locations and has not been repaired.

The Jackson Cove area was inspected for risk to people that may be recreating there. The outlet of Cayuse Mountain watershed, at the apex of a large alluvial fan, is confined by high land formations that act as natural levees and keeps the creek in its channel until it nears the road crossing just before it reaches the Spokane Arm of Lake Roosevelt. There is plentiful evidence that the previous large flood event that washed out Bull Pasture Road brought down sediment, but the channel on the alluvial fan was still able to contain the flow. Based on the field reconnaissance at Jackson Cove recreation area, it was determined that risk of impact to the recreation area is low.

There is a risk that the road that crosses the creek at the outlet could wash out in a flood event, but this risk is addressed by Storm Patrol and Hazard Sign treatments.

Outreach to Reoccupied Home or Unauthorized Temporary Housing in Hazard Area

Staff that notices unauthorized temporary housing (such as campers) downslope or downstream of the burned area should alert Public Safety Officials or notify the occupants of the potential risk of floods, mudslides and debris flows.

Additionally, there is a single wide trailer just to the southwest of the Payne Ranch along Wynecoop-Cayuse Mountain Road that sits at the outlet of a steep chute that was burned. It was reported that this house is currently unoccupied. If this home is reoccupied, it is recommended that it be moved out of the path of any potential floods or debris flows coming out of the chute above, or that the Tribe request that the NRCS do a site-specific assessment through their EWP program.

Conclusion

The major life safety hazard to these sites are from intense rainfall from a thunderstorm over the burned area that creates a flash flood or debris flow that could plug the channel with debris (rocks and logs). This could then cause a flash flood or debris flow to emerge from the channel and impact adjacent homes. Of lesser concern, but still a hazard, are rain events that are not intense, but that begin to move sediment down slopes into stream channels and further downstream, which could eventually aggrade stream channels (raise the bottom of the stream channel) enough that flood waters could emerge from the channel and impact residences. A large rapid snowmelt event could also cause a flood event of this nature.

Another hazard that must be considered is that as a stream channel begins to collect debris (logs, branches, rocks, sediment, human-disposed refuse), there is the potential for the formation of a

debris jam. These are formed when debris becomes lodged within the channel, creating a natural dam that begins to impound water behind it. The debris build-up will continue to grow until the amount of water impounded behind the debris jam causes the jam to fail and creates a flood wave. The potential for aggradation and debris jams is certainly highest during heavy rain events but debris jams are especially dangerous because they can give way even on good-weather days when people are not expecting a flood risk. There is not much that can be done to prevent aggradation or debris jams, so it is recommended that the watersheds above these sites be monitored for formation of these jams. When debris begins to collect within the channel it should be removed if possible, to prevent a blockage of the channel.

Lastly, it is recommended that residents talk to their insurance agents and investigate flood insurance options through the National Flood Insurance Program (NFIP) as most homeowner's insurance does not cover flood damage.

V. CONSULTATIONS

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BURNED AREA EMERGENCY RESPONSE PLAN

2016 CAYUSE MOUNTAIN FIRE

FOREST AND VEGETATION ASSESSMENT

I. OBJECTIVES

- Evaluate fire impacts to forest and vegetation resources and forest inventory plots.
- Estimate post fire vegetation response for the major vegetation types occurring in the fire area.
- Provide management recommendations to promote recovery of forest and vegetation resources.
- Determine potential impacts to threatened, endangered and rare plants.
- Determine and specify necessary stabilization and rehabilitation treatments and associated monitoring activities.

II. ISSUES

- Re-establishment of forest cover in high mortality commercial forest, forest reserves, riparian areas, and wildlife reserve areas.
- Potential encroachment of non-native invasive plants onto impacted lands.
- Tree hazards potentially impacting high use roads.
- Reestablishment of CFI plots damaged by fire.
- Fire impacts to culturally sensitive plants.
- Impacts to Forest Reserves

III. OBSERVATIONS

This report addresses known and potential effects of the Cayuse Mountain Fire to forest and vegetation resources on the Spokane Indian Reservation. Findings and recommendations contained in this assessment are based on information obtained from personal interviews and meetings with staff from the Spokane Tribal Forestry, Fire Management and Natural Resources Departments. Information was also derived from various planning documents and data sources, literature reviews, remote sensing imagery, and ground reconnaissance of the fire area.

A. Background

1. Management Direction

The following Spokane Tribal management direction directly applies to the proposed actions:

Forest Management Plan

- Assure regeneration of the forest by identifying sites where regeneration is needed, prescribing treatments and monitoring stand development.
- Planting should be considered as a viable option for regeneration when natural regeneration has failed or is uncertain or unlikely to meet management objectives.
- Planning for emergency rehabilitation projects will take place immediately after the site disturbance has occurred.
- Proposals to restore burned areas to full productivity shall be determined by the ID Team on a project specific basis in a Burned Area Emergency Rehabilitation (BAER) Plan.
- Projects shall involve both tree planting and site preparation measures such as: shade provision for natural regeneration, preparing microsites for planting or natural regeneration, and mechanically or chemically eliminating undesirable overstory dwarf-mistletoe infection.

- Rehabilitation may also involve forested sites with little sawtimber that need to be converted to a species more suited to the conditions on the site. In such instances, site preparation to convert to a more desirable species.

Integrated Resource Management Plan

- States, as of 1986, 35% of reservation was infested with undesirable or noxious weeds, the major problem being the knapweed complex.
- The goal for woodland (consisting primarily of aspen and cottonwood) management is to promote stand growth and expansion. This may be accomplished by expanding and regenerating existing sites, or by creating new stands.

Fire Management Plan

- Prioritize the protection of people, structures, infrastructure, and ecosystems that contribute and preserve the culture and way of life of the Spokane Tribe.
- Improve forest and rangeland quality through targeted management activities.

Range Management Plan

- Forestry-Range Interactions - ...An additional benefit of thinning stagnated stands is to increase the forage understory. Such practice results in the increase of understory herbage available for domestic and/or wild animals...

Draft Wildlife Mitigation Area Management Plan

- Protect wildlife habitat on Wildlife Mitigation Areas for future generations of Spokane Tribal members.
- Manage for and maintain quality habitat that will benefit wildlife populations that use Wildlife Mitigation Areas, by providing all of their life requisites (food, cover, water, or other special requirements supplied by habitat).
- Enhance and restore the productivity and connectivity of riparian and deciduous habitats on all Wildlife Mitigation Areas: restore or enhance habitat using native or highly desirable species; exclude livestock: fence property boundaries where livestock trespass is a concern; control invasive plant species through the use of effective and safe biological, chemical, and mechanical methods.

Draft Vegetation Management Plan

- High Concern Weeds: Dalmatian toadflax; diffuse knapweed; jointed goatgrass; leafy spurge; musk thistle; rush skeletonweed; spotted knapweed.
- Moderate Concern Weeds: bull thistle; Saint Johnswort; Scotch thistle; sulfur cinquefoil.
- Low Concern Weeds: cheat grass; houndstongue; Japanese brome.

2. Forest Cover

The forest types of the Spokane Reservation range from ponderosa pine savannas at the lowest elevations to moist late successional grand fir forest. The forest has been classified into silvicultural types which are essentially mapping complexes of forest habitat types designed to capture distinctions significant for silvicultural planning and prescriptions (Hensold, personal communication.) The Carpenter Road BAER plan has detailed descriptions of the groups. There were three groups within the perimeter of the Cayuse Mountain fire; Dry Pine, Pine-Fir and a very small bit of Ninebark:

Percent of Tribal Fire Area by Silvicultural Type Group

Silvicultural Type Group	Percent of Reservation Fire Area	Constituent Silvicultural Types
Dry Pine	32	pine/bunchgrass, bitterbrush steppe, pine/bitterbrush, Coulee pine-fir/bitterbrush
Pine-Fir	31	pine/fescue-snowberry, pine/snowberry, pine-fir/snowberry, pine-fir/basalt bluffs, pine-fir/bunchgrass, ridgetop pine-fir, pine-fir/pinegrass, pine-fir/basalt, low pine-fir/forbs, potholes fir-pine, canyon pine-fir
Ninebark	<1%	Douglas-fir/ninebark, Douglas-fir/ninebark-twinflower, pine-fir/ninebark, grand fir/ninebark
Other	36%	non-forest or untyped

3. Forest Reserves

Five forest reserves occur partially or entirely within the fire area. These areas have been removed from the commercial forest landbase. They consist of a combination of old growth forest remnants, wildlife corridors, inoperable areas, and stands with culturally significant plants.

Forest reserves may be divided into three general categories: yew reserves created to preserve older and larger yew trees, cedar reserves created principally to preserve western redcedar, and others that are roadless areas created as wildlife corridors between big game winter and summer ranges. Only roadless area reserves were impacted by the Cayuse Mountain fire.

Roadless Area Reserves

- Blue Creek-Sherwood
- Cayuse Mountain
- South Breaks
- Little Falls West Breaks
- Little Falls East Breaks

4. Continuous Forest Inventory Plots

A total of 92 Continuous Forest Inventory (CFI) plots occur within the fire area. The CFI system is used to track forest composition, structure, and growth, and is an essential component of the Forest Management Inventory Analysis and Planning process. Fires can damage or destroy CFI plot components including the aluminum center stakes, reference tree tags and markings, and individual tree number tags.

5. Non-Native Invasive Weeds

Non-native invasive weeds potentially affecting the fire area, based on a conversation with Reggie Peone, include Bull thistle, Canadian thistle, Scotch thistle, Spotted Knapweed, skeletonweed, goathead and Houndstooth. Populations of each of these are scattered in the fire area in small populations. In the case of spotted knapweed, it is primarily in people's yards. Goathead is found in one population at a campsite on Roosevelt Lake near Marion Wynecoop's residence. Houndstooth was found on Dick Wynecoop's property prior to the fire. There is a concern that these may increase as a result of the fire.

6. Threatened, Endangered and Rare Plants

No listed threatened, endangered or rare plants are known to occur within the fire perimeter. A U.S. Fish and Wildlife Service species list documenting non-occurrence is included in the plan appendix.

B. RECONNAISSANCE METHODOLOGY & RESULTS

1. Forest Mortality

An initial mortality map was developed from the BARC layer derived from the August 23 pass of the LANDSAT8 satellite. Mapping was verified through field and helicopter reconnaissance. Mapped mortality areas were classified into 4 categories; 0-25%, 25-50%, 50-75% and >75% mortality (see Vegetation Mortality Map.) Mortality level was then overlaid with silvicultural type group layer to determine the degree of mortality for each group.

2. Potential Reforestation

The assessment of potential reforestation areas was developed by the BAER forester and then verified through field visits. The GIS analysis was conducted by overlaying the vegetation mortality map over forested stands. Reforestation areas were selected based on the following criteria: large areas with no surviving overstory; large areas where the surviving overstory was insufficiently stocked or unevenly distributed; and past regeneration units where the regeneration was destroyed by the fire.

3. Forest Reserves

The effects to forest reserves were determined by overlaying forest mortality mapping with forest reserve areas. This was validated to some extent by field reconnaissance.

4. CFI

The number of CFI plots potentially impacted by the fire was estimated by overlaying CFI plot locations with forest mortality levels of 50 percent and above. With this analysis 62 plots could potentially be impacted. This is considered a basic estimate of the number of plots requiring reestablishment; the actual extent of plot damage will only be determined after all plots in burned areas are assessed in the field.

5. Tree Hazards

The determination of potential tree hazard areas is based on those areas directly adjacent to moderate and high public and administrative use roads within the fire area and around homes/homesteads within the fire area. These were determined from GIS covers of identified intermediate (IR) and light duty (LDR) system roads and by identifying structures via aerial photos. Because trees can be damaged and weakened by fire even in underburned areas, assessment areas include the entire length of these roads in the fire area and around all homes/homesteads.

C. FINDINGS

1. Forest Mortality

Acres of Silvicultural Type Group by Forest Mortality Level

Forest Types & Acres by Mortality Class					
Type	Mortality Class				Grand Total
	Low: 0-25% Mortality	Moderate Low: 25-50% Mortality	High: 50-75% Mortality	Very High: >75% Mortality	
Dry Pine	1,083	946	1,135	2,676	5,839
Ninebark	98	30	5	10	143
Pine-Fir	1,595	1,088	925	1,966	5,574
Other	1,661	868	1,262	2,708	6,498
Grand Total	4,437	2,931	3,326	7,361	18,054

The Cayuse fire was a wind driven fire that burned most of the area within the fire in the first burning period. Because it was wind driven, residence time over most of the fire area was low. This is shown by the Soil Severity map which shows that most of the fire area was light or moderate. However, there was sufficient fuel that caused high heat levels running through the crowns of the trees causing scorch kill of the pines and firs. Just under 60% of the area within the fire experiences mortality levels greater than 50% but of this, 3,970 acres are non-forested including shrublands and grasslands.

Timber growth and yield will be substantially reduced in stands that experienced moderate or high mortality. The likelihood of natural regeneration in high mortality areas is fairly low, particularly in those sites lacking suitable seed trees. Without artificial regeneration growth and yield will be substantially reduced in these areas for the foreseeable future.

Because the fire was fast with short residence time, generally, only the tops of the grasses and shrubs burned, leaving the roots intact. In some areas, grasses were seen to start greening up. Significant shrub regeneration can be anticipated in those silvicultural type groups that are shrub-dominated, essentially all the groups with the exception of Dry Pine. The Ninebark group has the greatest potential for resprouting abundantly. The Pine-Fir group has snowberry in most areas but its distribution can be patchy. In the Dry Pine group only the bitterbrush silvicultural types have a shrub layer. These responses are borne out by examining areas of the Dry Pine and Pine-Fir types in the Carpenter Road fire from last year. That fire burned in a similar manner to the Cayuse Mountain fire.

Many of the trees and shrubs that occur in riparian areas should resprout aggressively. However, due to their proximity to water and high palatability, browsing pressure may likely preclude successful natural regeneration.

2. Forest Reserves

Acres of Forest Reserve by Forest Mortality Level

Forest Reserves & Acres by Mortality Class					
Reserve Name	Mortality Level				Grand Total
	Low: 0-25% Mortality	Moderate Low: 25-50% Mortality	High: 50-75% Mortality	Very High: >75% Mortality	
Blue Creek-Sherwood (20% Impacted)	121	30	88	91	329
Cayuse Mountain (100% Impacted)	155	80	75	127	438
Little Falls Breaks East (21% Impacted)	88	13	2	8	110
Little Falls Breaks West (100% Impacted)	64	125	37	14	240
South Breaks (99% Impacted)	58	116	162	347	684
Grand Total	485	365	364	587	1,801

Little Falls Breaks East and Blue Creek-Sherwood Reserve areas were only partially impacted by the fire. All other reserve areas were fully impacted. South Breaks reserve was impacted the highest with 74% of the reserve experiencing greater than 50% mortality.

3. Potential Salvage

Potential salvage areas were determined by GIS analysis. Possible salvage areas are those that are outside reserves, outside wildlife areas, that had timber and that had a mortality class of greater than 25% mortality.

Management Unit & Forest Type Group	Mortality Class			Grand Total
	Moderate Low: 25-50% Mortality	High: 50-75% Mortality	Very High: >75% Mortality	
<i>Mid Elevation Pine Management Unit</i>				
Dry Pine	513	522	1,015	2,050
Ninebark	22	3	8	33
Pine-fir	525	411	872	1,808
<i>Riverbreaks Management Unit</i>				
Dry Pine	262	371	1,053	1,686

Pine-fir	138	86	129	354
Grand Total	1,459	1,394	3,078	5,930

The Mid Elevation Pine Management unit has approximately 3,890 acres of potential salvage while the Riverbreaks Management Unit has approximately 2,040 acres. Tribal Forestry is in the process of acquiring high resolution satellite imagery which will be useful, together with field reconnaissance, to further refine potential salvage areas. Consequently, the actual acreage of potential salvage may be less than these estimates.

4. Potential Reforestation

A total of 3,215 acres requiring reforestation were identified as displayed below:

Potential Reforestation Acres by Silvicultural Type Group

Silvicultural Type Group	Potential Reforestation Acres
Dry Pine	2,082
Pine-Fir	1,132
Ninebark	1
Total	3,215

Because of a lack of currently available seed reforestation plans will need to include an aggressive cone collection program, and most planting will have to be scheduled for out years.

4. CFI

A total of 62 plots were identified as occurring in moderate and high forest mortality areas and were likely seriously impacted by the fire. These plots and all remaining plots that experienced any degree of burning will need to be evaluated before a complete assessment of fire damage can be developed.

5. Tree Hazards

31 miles of roadside areas associated with moderate and high public and administrative use roads were identified as primary areas for tree hazard assessment. These include all identified intermediate (IR) and light duty (LDR) roads.

6. Non-Native Invasive Weeds

Populations of invasive plant species occur within and surrounding much of the fire area. The anticipated rapid natural reestablishment of native shrubs and herbs should retard invasion by non-natives on most sites. Areas most prone to invasion include disturbed sites (dozer lines, safety zones, bladed roads, etc) and areas that experienced high burn severity (see Burn Severity Map.) The most important vector for transmission of invasive species will likely be vehicular traffic (autos, ATVs, heavy equipment.)

A total of 138 miles of roads and 27 miles of dozer lines on Tribal lands within and adjacent to fire area were identified as potential vector areas. Based extending 40 feet from the centerline of

these roads and dozer lines the associated area considered highly susceptible to invasion is 1,419 acres.

7. Threatened, Endangered and Rare Plants

There is no known occurrence of any listed threatened, endangered or rare plant on Tribal lands within the fire perimeter.

IV. RECOMMENDATIONS

A. Emergency Stabilization (ES)

1. Invasive Species Assessment and Control

Conduct annual assessments of roads, dozer lines and other disturbed sites within and immediately adjacent to the fire area. An estimated total of 1,419 acres would be assessed and potentially treated. Assess for noxious weeds and non-native invasive plant species of concern identified in the Spokane Tribe Vegetation Management Plan. Species occurrence and abundance will be noted and photographed and the locational information will be recorded.

If significant invasive is detected prepare a BAER plan amendment for invasive species control through a combination of chemical, biological and other integrated pest management methods. Chemical selection and application methods and rates would conform to guidelines detailed in the Tribe's Vegetation Management Plan.

2. Tree Hazard Assessment and Mitigation

Assess primary system roads within the fire perimeter to determine number and location of tree hazards. An estimated 31 miles of roads would be assessed and potentially treated. Assess all trees within striking distance of road edges in conformance with the National Park Service Tree Hazard Rating System. Designate each identified tree hazard with paint or flagging and record the following information: tree number, species, diameter breast height, hazard rating, and GPS location. Based on assessments potentially prepare a BAER plan amendment to request funds for tree hazard mitigation..

B. Burned Area Rehabilitation (BAR)

1. Reforestation

Reforest highly impacted commercial timber stands and forest reserves that are not expected to regenerate naturally within 10 years. Principally ponderosa pine would be planted; incidental amounts of other species may also be planted as detailed in regeneration prescriptions. Tree species and planting spacing and methods will be tailored to the silvicultural site. Initiate seed collection/procurement and seedling propagation and plant an estimated total of 3,215 acres.

2. Stocking Surveys

Conduct stocking surveys in all plantations including riparian restoration areas. Surveys will record species, size and condition of both planted and naturally regenerated trees, including sprouting hardwoods particularly in riparian restoration sites. The type and level of competing shrub and herbaceous vegetation will be recorded as well. Survey each plantation on year 1, 3 and 5.

3. CFI Plot Reestablishment

Assess 62 CFI plots identified as potentially damaged by the fire. Reestablish plot center stakes, reference trees including tags and markings, and individual tree number tags as necessary. Assess potential damage on any additional plots that may have experienced fire damage.

V. CONSULTATIONS

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VI. REFERENCES

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Analysis of the 2010 Forest Inventory Spokane Indian Reservation (2014)
Integrated Resource Management Plan for the Spokane Indian Reservation (2008)
Wildland Fire Management Plan for the Spokane Indian Reservation (2005)
Spokane Tribe of Indians Range Plan (2010)
Spokane Tribe of Indians Wildlife Mitigation Area Management Plan (Draft)
Spokane Tribe Vegetation Management Plan (Draft)

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BURNED AREA EMERGENCY RESPONSE

2016 CAYUSE MOUNTAIN FIRE

CULTURAL RESOURCE ASSESSMENT

I. OBJECTIVES

- A. Assess risks to significant cultural resources from the effects of post-fire erosion, flooding, other fire related effects and looting.
- B. Consult with the Spokane Tribe to elicit tribal concerns regarding significant cultural resources and to meet Federal legal requirements, agency policies, and agreements.
- C. Prescribe emergency stabilization treatments to significant cultural resource that are likely to be at risk from post-fire effects such as erosion, flooding, and looting.
- D. Prescribe treatments to avoid or mitigate potential adverse effects to significant cultural resources resulting from the implementation of emergency stabilization treatments employed to address other values at risk.

II. ISSUES

- Erosional/Depositional processes affecting archaeological sites along the river.
- Post-fire effects to upland sites
- Coyote Rocks Traditional Cultural Place (TCP)
- Fire-damaged fences at cemeteries
- Fire effects on culturally used plants

III. OBSERVATIONS

A. Background

This report addresses observed and potential effects to cultural resources within the Cayuse Mountain Fire on the Spokane Indian Reservation. There is a moderate diversity of archaeological site types that are known, or expected to exist across the landscape affected by these fires or that have the potential to be affected by post-fire effects. Site types include habitation sites, cemeteries and individual burials, storage pits, stacked rock features, rock art, culturally modified trees, and historic residential structures. Other cultural resources include traditional resource gathering locations and TCPs.

B. Reconnaissance Methodology and Identification Results

Two Burned Area Emergency Response (BAER) team archaeologists were dispatched to the incident. The field assessment commenced on Friday September 2, 2016 and concluded on Tuesday September 6, 2016. Known cultural resources locations along the Spokane River arm of the Lake Roosevelt shoreline, and points presumed to represent plant gathering areas were the focal points of the assessment. Resources assessed along or above the river shoreline included occupation sites, burials, pictographs, a fenced cemetery, and a TCP.

Assessment within the fire interior included a small family cemetery, an historic residence, talus pit features said to represent storage pits, and mapped point locations associated with plant gathering

activities. The inability to access discrete information that corresponded to mapped points provided to the BAER team archaeologists, limited identification efforts.

C. Findings

Archaeological Sites

A variety of site types were visited during the assessment. Four pre-contact occupation areas were assessed along the river. Aside from the cemeteries noted below, two burial locations along the river were also assessed. A pictograph site was assessed as were two talus storage pit locations. Lastly, an assessment was done at the location of an historic residence.

Three of the four occupation sites were found to be located below areas of low to moderate burn severity in relatively level or low gradient terrain. Any steeper slopes above sites generally had short runs limiting their ability to adversely affect the sites. These sites are not expected to be at risk from flooding or erosion. The fourth riverside site is, however, located in an area that could be potentially subject to flooding and erosion, including the potential of debris flows. The site has been subject to formal testing in the past and was shown to contain buried cultural deposits to a substantial depth. Although no readily recognizable surface component is present, it may be obscured by ground cover. There is no feasible treatment available to protect this site.

Neither of the two burial sites assessed are at risk from post-fire effects. Both of these sites are located outside the burn. While one of the sites lies adjacent to a drainage that sustained low burn severity, it is below an expansive area of level agricultural ground that did not burn and at an elevation well above the mouth of the stream channel.

The pictograph panels are situated in an area that varies from unburned to low burn severity. The fire scorched some of the understory plants surrounding the site, but the panels exhibit no fire effects. The pictographs are located on the downslope side of a bedrock outcrop and thus shielded from any erosional effects that might occur in the area. There are no post-fire risks to this site.

The talus storage pits are located on relatively steep slopes in an upland location that sustained moderate burn severity. They are of large mass on a relatively stable landform and should not be susceptible to post-fire flow events. Several relatively small burned hazard trees were identified adjacent to or downslope from the pits. The trees were marked by Spokane Preservation Program staff to remain standing unless their collapse posed a threat to the integrity of the pits.

One previously collapsed historic residential structure was consumed by the fire. Known as a "Washington House", all that remains is a scatter of historic debris, including a cast iron cook stove and the ashy ghost image of the structural elements of the house. The site is located on a level terrace with surrounding gentle slopes. Burn severity in this area is generally low. The only post-fire risk could be from looting, although an inspection of the site revealed little that would be of interest to the casual collector of historic artifacts.

Cemeteries

A fenced cemetery above the river was found to have been slightly burned over. Several of the associated boundary fence posts were singed, but do not need replacement. There is no risk from post-fire flooding or erosion.

An enclosure fence around the Stevens family cemetery located along the northern boundary of the fire sustained fire damage and is recommended for reconstruction. The cemetery is located on a small prominence and is not at risk from post-fire effects.

TCP

A TCP, known as Coyote Rocks was found to be unburned, and downstream from areas that were likewise unburned or of a very low to low burn severity. This cultural resource is not at risk from post-fire effects.

Cultural Plants

Spokane Tribal Archaeological and Preservation Program Staff identified six plants known within the fire area to be of cultural importance. It should be acknowledged that it is likely there are other plants of cultural significance to tribal members. The list provided to the BAER archeologists include: Bitterroot (*Lewisia rediviva*), Camas (*Camassia quamash*), Chokecherry (*Prunus virginiana*), Foamberry (*Shepherdia canadensis*), Serviceberry (*Amelanchier alnifolia*), and Morels (*Morchella spp.*).

Bitterroot and Camas are both dormant during the late summer and accordingly are not likely to have been affected by the fire. Chokecherries may have sustained damage to foliage and stems. However these plants quickly sprout and it has been observed that chokecherries often increase in the years after a fire. Foam berry is fire resistant and responds favorably to low to moderate intensity fires. Serviceberry is subject to top kill in all but low severity fire, however it readily sprouts from the root crown, with cover often increasing after a fire. Morels are fire-adapted species and grow in abundance, particularly under fire regimes of moderate burn severity.

Soil burn severity is predominately unburned to low, (69%), followed by moderate (28%), and finally high (3%). With such values, it is expected that these cultural plants will recover naturally.

Additional information concerning these species and their response to fire may be found in Forest and Vegetation Assessment.

IV. RECOMMENDATIONS

A. Emergency Stabilization

Specification ES-6 Cemetery Fence Construction: An exclusion fence surrounding the Stevens family cemetery sustained fire damage. This treatment is designed to exclude feral horses and other livestock from the area to protect the gravesites.

B. Burned Area Rehabilitation

Specification BAR-5 Archaeological Survey of Reforestation Locations: Approximately 3,200 acres are proposed for hand planting to re-establish forest stands impacted by the fire. As a ground disturbing activity, this treatment will require compliance with the National Environmental Policy Act (NEPA) and Section 106 of the National Historic Preservation Act, as amended (NHPA).

C. Non-Specification Management Recommendations

- Complete survey of suppression impacted areas.
- Record remains of the "Washington House".
- Inventory high sensitivity areas where fire has removed the ground cover

V. CONSULTATIONS

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BURNED AREA EMERGENCY STABILIZATION PLAN

2016 CAYUSE MOUNTAIN FIRE

FISHERIES RESOURCE ASSESSMENT

I. OBJECTIVES

- Assess the effects of the fire and prescribed emergency stabilization measures to Federally Listed Threatened and Endangered fish species on the Spokane Indian Reservation lands.
- Conduct Section 7 Emergency Consultation with the U.S. Fish and Wildlife Service (USFWS).
- Prescribe emergency stabilization measures, recommendations, and monitoring if warranted to benefit federally listed species and/or tribal species of interest.

II. ISSUES

A. T&E Fish Species

Bull trout (*Salvelinus confluentus*) is the only federally listed threatened or endangered fish species documented to occur in Lake Roosevelt. Lake Roosevelt delineates the south and west perimeter of the Cayuse Mountain Fire. Bull trout is listed as a threatened species however, critical habitat for bull trout does not occur within or adjacent to the fire area.

B. Other Species of Interest/Recreational Fisheries

There are several other fish species of interest to the Spokane Tribe, most notably those associated with Lake Roosevelt which supports a popular recreational fishery.

C. Water Quality

Post-fire impacts to water quality in Lake Roosevelt, Benjamin Lake, and Mathew Lake was identified as an issue of concern by the Spokane Tribe, in particular any potential increases in nutrient loading and impacts to native and game fish species.

III. OBSERVATIONS

A. Background

The Cayuse Mountain Fire burned approximately 18,086 acres on the Spokane Indian Reservation in Stevens County, WA. Approximately 17,767 acres of Spokane Indian Reservation lands, 183 acres of Bureau of Reclamation lands, and 136 acres of private fee land were burned by the fire. Bull trout, a Federal threatened species, have been documented to occur in Lake Roosevelt within and downstream of the fire perimeter (Elliott Kittel, Pers. Comm.).

The Spokane Arm of Lake Roosevelt supports a popular recreational fishery and contains the following species: native Redband trout (*Oncorhynchus mykiss gairdineri*) as well as hatchery rainbow trout, native and hatchery kokanee salmon (*Oncorhynchus nerka*), White sturgeon (*Acipenser transmontanus*), burbot (*Lota lota*), and Bull trout. Several non-native game species also occur in Lake Roosevelt and include: Walleye (*Sander vitreus*), smallmouth bass (*Micropterus dolomieu*), brown trout (*Salmo trutta*), brook trout (*Salvelinus fontinalis*), yellow perch (*Perca flavescens*), black crappie (*Pomoxis nigromaculatus*), and pumpkinseed (*Lepomis gibbosus*). In addition, recreational fishing occurs at Benjamin and Mathew Lakes on the Spokane Indian Reservation.

B. Reconnaissance Methodology and Results

Information used in this assessment was generated from review of relevant literature, recovery and management plans, GIS databases, and discussion with fisheries biologists and natural resource managers from the Spokane Tribe and BAER team members. Field reconnaissance consisted of on-site inspection of fire impacted habitats on tribal trust lands, known occurrence areas, and areas downstream of fire perimeters that could potentially be impacted by sediment and debris flows. Field reconnaissance was conducted between September 2 and September 4, 2016.

The USFWS Lacey Office has jurisdiction over the listed species within the area of the fire. Identification of known listed species occurrences and critical habitat is crucial to accurately assessing fire effects. A resource report was obtained from the USFWS Information for Planning and Conservation (IPaC) website on September 5, 2016 for a list of threatened and endangered species occurring within the Cayuse Mountain Fire perimeter.

C. Findings

One perennial watershed, Flett, was impacted by the Cayuse Mountain Fire. Several ephemeral watersheds drain the fire area into Lake Roosevelt. These watersheds include: Sherwood Mountain, Flett, Chief, Cayuse Mountain, Prospect, Wellpinit, and Mine (See: Appendix IV Watershed Supporting Documents). The effects of wildfire on watersheds are well documented and presented in the Watershed Assessment. Concern for the effects of the fire on Lake Roosevelt fisheries will focus on the risk of accelerated erosion, increased peak flows, and water quality/nutrient loading from the burned slopes that drain into Lake Roosevelt. The potential for increased inputs of fine sediment could adversely affect downstream aquatic life. The specific areas of concern lie within the immediate area of the fire adjacent to Lake Roosevelt.

1. Biological Assessment for Federally Listed Fish Species

The U.S. Fish and Wildlife Service maintains the current list of Proposed, Threatened, Endangered, and Candidate species and publishes the information in the Federal Register. A species list for the fire area was obtained on September 5, 2016 from the USFWS Information for Planning and Conservation (IPaC) website. The following listed fish species have been documented to occur within the Cayuse Mountain Fire.

Common Name	Scientific Name	Listing Status	Biological Assessment Effects Determination
Bull trout	<i>Salvelinus confluentus</i>	Threatened	No Effect

Bull trout: The U.S. Fish & Wildlife Service listed bull trout as a Threatened species under the Endangered Species Act of 1973 on June 10, 1998 (USFWS 1998, Federal Register Vol. 63, No. 111). Critical habitat for bull trout has not been designated in the Spokane River or Lake Roosevelt (USFWS 2010, Federal Register Vol. 75, No. 200).

Analysis of GIS databases, species distribution maps, and consultation with species experts indicates that Bull trout has been documented to occur in Lake Roosevelt on the Spokane Indian Reservation within and downstream of the fire perimeter. Very few Bull trout occur in Lake Roosevelt with the presumption being that these fish occasionally migrate into the lake from the Pend Oreille system which is located upstream of the fire area (Elliott Kittel, Pers. Comm.).

Effects Determination

Direct effects refer to mortality or a disturbance that flushes, displaces, or harasses the animal. Indirect effects refer to delayed effects, such as modification of habitat and effects to prey species.

Direct Fire Effects: No direct effects to Bull trout from the fire or fire suppression efforts were documented during the Cayuse Mountain Fire. No direct effects to Bull trout from proposed BAER treatment activities are anticipated.

Indirect Fire Effects: The dozer lines constructed during suppression efforts have runoff potential for sediment delivery to stream channels draining the Cayuse Mountain Fire. These are considered short term impacts as fire suppression rehabilitation and erosion control measures will mitigate any significant amount of sediment entering these creeks. No indirect effects to Bull trout from proposed BAER treatment activities are anticipated.

Based on field reconnaissance, literature reviews, rarity of species presence, no critical habitat designation in the area, and discussions with local biologists, BAER Emergency Stabilization treatments will have “**No Effect**” to Bull trout.

2. Effects to Fish/Water Quality/Aquatic Systems

Fish

Fish populations have been found to respond in a variety of ways to the effects of large wildfires (Reiman and Clayton 1997). Refugia are known to be a key component in the recovery of salmonid populations. When salmonids are severely depressed by the effects of fires, a migratory life history may aid in the recovery and persistence of a population (Reiman and Clayton 1997). Gresswell (1999) presents an overview of direct and indirect effect of fire on aquatic ecosystem processes and biological communities.

The effects of wildfire on fish and aquatic resources may depend on multiple factors that include: the scale and severity of fire; existing watershed and riparian condition; the connectedness of habitats that provide for potential refugia and re-colonization; and the potential for the full range of life history expression (Reiman et al. 1997, Gresswell, 1999). Fire can alter the quantity, quality, and use of habitat via the alteration of water temperatures, sedimentation rates, riparian vegetation, nutrient availability, food sources, and woody debris (McMahon and deCalesta 1990).

Water Quality and Nutrient Cycle-Aquatic Systems

Wildfires can also have an effect on the nutrient cycle in aquatic systems. Usually there is an initial nutrient pulse after a wildfire. This is followed by a gradual decrease in nutrient loss from the watershed because of the high recovery of net photosynthetic rates of terrestrial vegetation. Low nutrient concentrations in the stream 5-10 years after the fire are expected to contribute to the decline in autochthonous production (Minshall, Brock, and Varley 1989). Enhanced light levels will increase primary production for 10-20 years. Additionally, the changing light levels will cause a shift in the benthic flora from diatoms and moss to green algae with occasional formations of filamentous algal mats. There are two major factors affecting the pattern of dissolved nutrient concentrations in streams: 1) water borne transport, and 2) biotic uptake and release. Nutrient increases are usually small or of a short duration after a fire and their effects on fish populations and food resources are negligible in most cases. Robichaud et al (1993) observed relatively little sediment transport and minimal nutrient losses following a low intensity burn in northern Idaho, however, nutrient spikes following fire are most common during storm events in the autumn and after the summer period of maximum algal production and fish growth.

Chemical water quality measurements after wildfire are generally for nitrogen and phosphorous. Nitrogen can occur in several forms in a stream; however the nitrate-nitrogen ion (most common form used by vascular plants) is typically studied as a result of its mobility through the soil-water system. In general, nitrate concentrations are low in undisturbed watersheds and have relatively small increases following wildfire. Nitrogen export from watersheds is dependent on the amount present and streamflow. The severity and intensity of wildfires affects nitrogen export and concentrations in watersheds. Phosphorous in watersheds is present primarily in two forms 1) orthophosphate (the inorganic form) and 2) organic phosphate with the losses of phosphates after wildfire are generally negligible (Beschta, 1990).

Similar to streams, the nutrient cycle of lakes and reservoirs can be affected with pulses of nutrients following a wildfire event. Nutrients such as ammonium, phosphorous, potassium, and alkalinity typically increase in aquatic systems following ash input. Concentrations of these nutrients can return to pre-fire levels within 4 months following input to water bodies (Earl and Blinn, 2003). Concentrations of major ions, turbidity levels, and pH can increase immediately in aquatic systems downstream or at the point of entry to a water body following ash inputs, however these changes in water chemistry are typically short lived, less than 24 hours (Earl and Blinn, 2003).

Larger lakes and/or reservoirs typically see lower impacts to water quality and nutrient cycle from wildfire events. For example, an analysis of water quality records for

Yellowstone and Lewis Lakes collected over a fifteen year period between 1976 and 1991 have shown only a minimal shift in lake water quality following the large wildfires in 1988. Approximately 25 percent of these respective watersheds were heavily burned, however these lakes were large enough to dilute increased inputs and have experienced few lasting effects from the 1988 fires (Lathrop, 1994).

Lake Roosevelt-Spokane Arm

Approximately 69% of the Cayuse Mountain Fire experienced unburned/very low and low burn severities. Modeled watershed results show that 2 of the 7 watersheds have the potential for noticeable sediment yields and ash delivery into Lake Roosevelt. These watersheds, Cayuse Mountain (5.1 mi²) and Prospect (5.6 mi²), show a potential increase in sediment yield to the outlets of 930% and 3,352%, respectively. These model results represent the initial flush of sediment and ash following the first significant streamflow generating storm event that could potentially impact water quality and nutrient levels and are expected to decrease significantly following subsequent storm events.

Given the size of the Spokane Arm of Lake Roosevelt (approximately 11,500 surface acres and nearly 32 miles long) it is thought that fish in the reservoir will be able to largely avoid areas with high concentrations of suspended sediment and turbidity, thereby minimizing the effects to these species. In addition, size of the watersheds contributing flow to the reservoir is small compared to the volume of water in the reservoir therefore, no significant impacts to water quality and nutrient loading are expected to occur.

Benjamin Lake and Mathews Lake

The following information on Benjamin and Mathews lakes was obtained from the Integrated Resource Management Plan for the Spokane Indian Reservation (2008). Benjamin Lake has no natural surface inflows to the lake except during spring run-off. The surface acreage is 13.4 surface acres and holds 483 acre-feet when full. The maximum depth is 35 feet. Fish species in the lake include rainbow trout, pumpkinseed, and largemouth bass. Mathews Lake has no natural inflow with a surface acreage of 2.7 acres and holds approximately 42 acre-feet with a maximum depth of 18 feet. Brook trout and pumpkinseed occur in the lake.

The area surrounding these lakes contains low topographic relief, low soil burn severity, and low fire intensity adjacent to and upslope of the lakes. Both lakes have significant riparian areas that are intact which will filter of any potential sediment inputs. No anticipated effects to water quality for either lake are expected to occur.

IV. RECOMMENDATIONS

Based on the results of the above observations:

A. Emergency Stabilization

None.

B. Management Recommendation – (Non-Specification)

Continued or potentially increased water quality monitoring in Lake Roosevelt, particularly following storm events which could deposit sediment and ash into the reservoir.

V. CONSULTATIONS

Brian Crossley, Water Quality Manager, Spokane Indian Reservation-Water and Fish Program
Elliott Kittel, Fisheries Biologist, Spokane Indian Reservation-Lake Roosevelt Fisheries Program

VI. REFERENCES

Earl, Stevan R., and Blinn Dean W. 2003. Effects of Wildfire Ash on Water Chemistry and Biota in Southwestern USA Streams. *Freshwater Biology*, Vol. 48, pages 1015-1030.

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BURNED AREA EMERGENCY RESPONSE PLAN
2016 CAYUSE MOUNTAIN FIRE
PUBLIC SAFETY INFRASTRUCTURE ASSESSMENT

I. OBJECTIVES

- Assess and mitigate fire damage to facilities necessary for public safety.
- Assess and mitigate public safety concerns created or exacerbated by fire impacts.
- Initiate implementation of emergency stabilization and burned area rehabilitation treatments prescribed by the BAER team and develop an organization and process to ensure completion of treatments.

II. ISSUES

- Public safety hazards resulting from or exacerbated by fire-related impacts.
- Fire damage to safety signs, safety guard rails and other critical public safety infrastructure damaged by the fire on tribal lands.
- Fire damage to recreation facilities.

III. OBSERVATIONS

A. Background –

The Cayuse Mountain fire started on August 15, 2016 on private lands southwest of the Spokane Indian Reservation (SIR). The fire was blown to the northwest on high winds and crossed the Spokane arm of Lake Roosevelt and burned approximately 18,100 acres on the SIR. Most of that was within the first burn period. The fire burned or damaged 14 homes and an undetermined number of additional structures.

B. Reconnaissance Methodology and Results

Potential areas of concern were identified through discussions with the respective Incident Management Teams, resource advisors, tribal and agency officials, and local residents. Focused ground was then conducted on tribal lands within the fire area by BAER team members and Tribal representatives. Potential infrastructure needs were identified, mapped, photographed and recorded. These include:

- Damaged or destroyed traffic signs.
- Damaged highway guard rails.
- Damaged vault toilet.

Roads that were surveyed include, the Elijah, Sherwood Mine, Wynecoop-Cayuse Mountain, Wellpinit-Little Falls roads.

C. Findings

Roadside Guard Rails – Damaged guard rails were found on Elijah Road (3 sections totaling 1,090 feet); Sherwood Mine Road (7 sections totaling 2,950 feet) and the Wynecoop-Cayuse Mountain Road (2 sections totaling 675 feet.) There were no other guardrails on other roads.

Safety and Directional Signs – A total of 31 damaged signs and 27 damaged posts were found on Sherwood Mine Road, Elijah Road and the Wellpinit-Little Falls Highway.

One pit toilet was completely burned at the Jackson Cove Recreation Area. Inspection shows that the vault is still intact though the building was totally destroyed.

IV. RECOMMENDATIONS

A. Specification Related

ES Specifications:

Road Guard Rail Repair - Replace approximately 4,715 feet of guard rails. Steel posts will be used to replace burned wood posts.

Traffic Signs - Replace 31 fire damaged road traffic signs and 27 associated posts to alleviate public safety hazards.

BAR Specifications:

Pit Toilet Reconstruction – Rebuild the pit toilet using wood construction, utilizing Tribal employee labor. Purchase boards, plywood, shingles, door and other necessary materials from local vendors where possible.

B. Management Recommendation - Rehabilitation (Non-Specification)

None

C. Management Recommendations – Non-Specification Related

None

V. CONSULTATIONS

Name, title, and agency	Telephone
Randy Hardwick, Tribal Roads Maintenance Supv, Spokane Reservation	509 458-6546
Andy Moss, Tribal Water and Fish Program, Spokane Indian Reservation	509 626-4410

VI. REFERENCES

NONE

Fred vonBonin, Fuels Analyst, SWRO, Albuquerque, NM (505)563-3381
Kevin Ritzer, Tribal Forester, Spokane Tribe, Wellpinit, WA, (509)626-4457

BURNED AREA EMERGENCY RESPONSE PLAN

2016 CAYUSE MOUNTAIN FIRE

WILDLIFE ASSESSMENT

I. OBJECTIVES

- Assess effects of fire and suppression actions to federally listed Threatened and Endangered species and designated critical habitat on Spokane Tribal trust lands.
- Assess effects of proposed emergency stabilization and rehabilitation actions to Threatened or Endangered plant species and habitat.
- Prescribe emergency stabilization and rehabilitation measures if needed.
- If required, initiate Emergency Section 7 Consultation as required by the Endangered Species Act.

II. ISSUES

- Listed species have the potential to occur within, or down stream of, the fire perimeter.
- Potential effects to this species from the fire, suppression actions and potential post fire effects to downstream species.
- Potential effects to this species from proposed emergency stabilization and rehabilitation actions.

III. OBSERVATIONS

Background – The Cayuse Mountain Fire was declared 95% contained on September 4, 2016, after burning approximately 18,116 acres across the southern portion of the Spokane Indian Reservation. Moderate rainfall has fallen in the past week causing minor washouts and sediment displacement in some areas.

The Huckleberry Mountains in the vicinity of the Cayuse Mountain Fire provide habitat for a wide variety of species, including elk, mule deer, white-tailed deer, moose, gray wolf, bobcat, mountain lion, beaver, river otter, striped skunk, long-tailed weasel, black bear, coyote, porcupine, blue grouse, ruffed grouse, deer mouse, mountain cottontail, bats, numerous species rodents, wild turkey, nuthatches, woodpeckers, blue birds, hummingbirds, doves, hawks, owls, crows, flying squirrels and ravens.

Reconnaissance Methodology and Results – Information used in this assessment was generated from review of relevant literature, recovery and management plans, GIS databases, post-fire ground and aerial observation, and discussion with species experts from the Spokane Tribe.

The USFWS Field Office-Portland has jurisdiction over federally listed species within the area of the fires. Identification of known listed species occurrences and critical habitat is crucial to accurately assessing fire affects. A species list for Spokane Indian Reservation was generated. GIS data from the Spokane Tribe was made available to the BAER Team for analysis by local species experts.

This Wildlife Assessment is a summary of fire effects to species and their habitats. While the effects of the fire to the vegetation that makes up their habitats is discussed, a more thorough coverage of impacts to vegetation communities and watersheds can be found in the BAER Forestry/Vegetation and BAER Assessment. These reports contain more detailed description of pre and post fire vegetation, post fire vegetation recovery estimates, run-off and debris flow estimates and results of hydrologic modeling. Additionally, information on the fire cause, start location and time, behavior, and suppression actions can be found in the Incident Management Teams' documentation.

Range – The Spokane Tribe Range department manages range lands within the fire perimeter for both livestock and feral horse grazing. Reconnaissance efforts unveiled the fatalities of at least 10 feral horses with numerous others severely burned. Local

enforcement has since dispatched 2 horses and will put down 1 or 2 more in the coming days due to severe burns or injuries. No other range animals have been impacted by the fire. Range usage has since been shut down due to the lack of forage in the burn area. Resource advisors that took part in reconnaissance and discussions included Jacob Turner, Spokane Tribe Wildlife Mitigation Program Manager; Juliette Jeanne, Fort Apache Agency; Chad McCrea, Spokane Tribe Wildlife Program Manager; Reggie Peone, Spokane Tribe Range Program Manager; Brian Crossley, Spokane Tribe Water Resources Manager; Billy Joe Kieffer, Spokane Tribal Department of Natural Resources Director.

- C. Findings** - Analysis of GIS databases, species occurrence maps, and consultation with species experts indicates that no Federally Listed Threatened and Endangered species occur in the vicinity of the Cayuse Mountain Fire.

Yellow-billed Cuckoo, *Coccyzus americanus* is listed as threatened, but is not known to exist on the Spokane Indian Reservation. Critical habitat is proposed for this species.

Grizzly Bear, *Ursus arctos horribilis* is listed as threatened, but is not known to exist on the Spokane Indian Reservation. No critical habitat has been designated for this species.

North American Wolverine, *Gulo gulo luscus* is listed as proposed threatened, but is not known to exist on the Spokane Indian Reservation. No critical habitat has been designated for this species.

Washington Ground Squirrel, *Urocitellus washingtoni* is listed as candidate species, but is not known to exist on the Spokane Indian Reservation. No critical habitat has been designated for this species.

Bull trout, *Salvelinus confluentus*, is listed as proposed threatened, but is not known to have significant populations on the Spokane Indian Reservation. Critical habitat has been designated for this species, but it does not occur on the Spokane Indian Reservation.

Due to lack of occurrence and potential habitat, there will be **no effect** to any federal candidate, threatened or endangered species with the potential to occur on the reservation as provided by the US Fish and Wildlife Service.

IV. RECOMMENDATIONS

Based on the results of the above observations:

A. Emergency Stabilization

There are no stabilization activities proposed for the sole benefit of wildlife. All of the proposed emergency stabilization activities in the vicinity of Cayuse Mountain Fire will have an indirect beneficial effect on wildlife. There is one fence within the boundary of the fire that was burned and is managed for the protection of wildlife habitat. This fence will need minor repairs to replace wooden corner braces and will be funded and repaired by the Wildlife Mitigation Program.

B. Management Recommendation – Rehabilitation – (Non-Specification)

While there is no direct action for the sole benefit of wildlife and fisheries, we do have the potential to reseed areas that sustained significant loss of vegetation with native grasses and bitterbrush that is a critical source of food for the wintering range of tribally important Elk, Deer and Moose. The concern of invasive plants getting established in these areas is covered under Item 10 of Section M under the Policy (3.7) in the BAER Manual.

There are four drainages (~450 acres total) located within the fire perimeter that received significant loss of vegetation. This loss will have an effect on wildlife due to their reliance on vegetation and cover during the winter months. Soil stabilization is another concern that will be addressed in the watershed assessment of this BAER report.

Reseeding Costs:

- PLS for native grass and Bitterbrush = \$3.74 /lb. or \$53.05 /Acre
- Helicopter Flight time = \$1150 /hr + \$500/day bucket fee

With a recommended 14.2 lbs/acre for aerial reseed, and 450 acres to reseed, that equals out to 6390 lbs of seed. The helicopter can disperse 3000 lbs. of seed per trip which would allow for 1 days' worth of flight time, around 8 hours total including taxi time from Olympia, WA. This would equal out to \$33,598 for re-seeding costs over 4 major drainages.

Though reseed is not a requirement, it would be a beneficial action to increase forage in the burned area, provide soil stabilization in the coming years, and also improve water quality in the surrounding streams and ponds.

To reduce the spread of invasive species after a fire, the BAER team recommends the use of biological and/or chemical treatments on areas within the fire perimeter that have known invasive weed colonies.

The Cayuse Mountain Fire provides a unique opportunity for biologists and the scientific community to determine species and habitat responses to wildfire. Given the high level of interest regarding the effects of the fires to the many species impacted by the fire, it seems prudent for biologist to collaborate on a list of questions to address identified concerns. The limited focus of the BAER Team to address immediate treatments for federally threatened and endangered species occurring on Spokane Tribal lands allowed only a cursory assessment of fire effects to the many other important species that contribute to the biodiversity of the area. As assessment and study continues, and if additional new information becomes available on the effects to federally listed species, agency biologists may re-assess the potential need for rehabilitation treatments, with subsequent requests for burned area rehabilitation funding.

V. CONSULTATIONS

- Jacob Turner, Spokane Tribe Wildlife Mitigation Program Manager
- Juliette Jeanne, Fort Apache Agency, White River, AZ
- Robert Stephens, Spokane Tribe Wildlife Mitigation Program Manager
- Chad McCrea, Spokane Tribe Wildlife Program Manager
- Reggie Peone, Spokane Tribe Range Program Manager
- Brian Crossley, Spokane Tribe Water Resources Manager
- Billy Joe Kieffer, Spokane Tribal Department of Natural Resources Director
- Jason Lowe, Bureau of Land Management Wildlife Biologist

VI. REFERENCES

- Spokane Tribal Integrated Resource Management Plan
- Spokane Tribal Wildlife Mitigation Plan
- Spokane Tribal Vegetative Management Plan
- USFWS IPac Trust Resources Report found in the Appendix
- Prices from local supplier Rainier Seed
- Prices include flight quotes from NW Helicopters in Olympia, WA

Jacob Turner, Spokane Tribe Wildlife Mitigation Program Manager

BURNED AREA EMERGENCY RESPONSE PLAN

2016 CAYUSE MOUNTAIN FIRE

APPENDIX II

ENVIRONMENTAL COMPLIANCE



View of burn area along Mathews Lake

BURNED AREA EMERGENCY RESPONSE PLAN
2016 CAYUSE MOUNTAIN FIRE
ENVIRONMENTAL COMPLIANCE

A. FEDERAL ENVIRONMENTAL COMPLIANCE RESPONSIBILITIES

All projects proposed in the 2016 Cayuse Mountain Burned Area Emergency Response (BAER) Plan that are prescribed, funded, or implemented by Federal agencies on the Spokane Indian Reservation are subject to compliance with the *National Environmental Policy Act* (NEPA) in accordance with the guidelines provided by the *Council on Environmental Quality (CEQ) Regulations (40 CFR 1500-1508)*. This Appendix documents the BAER Team considerations of NEPA compliance requirements for emergency stabilization, rehabilitation and monitoring actions described in this Plan for tribal trust acres affected by the Cayuse Mountain Fire. For any proposed activities not addressed in this Plan, the BIA must complete separate NEPA analyses and compliance documentation.

This plan has been developed by an Interagency BAER Team, with assistance from Spokane Agency BIA and Spokane Indian Tribe.

Agency Specific Guidance: This NEPA documentation has been developed in accordance with the following agency specific guidelines.

- **Bureau of Indian Affairs:** Burned area emergency stabilization and monitoring actions proposed on Tribal Trust lands will comply with NEPA compliance guidelines contained in the Indian Affairs Manual (59 IAM Chapter 3) policy, requirements and responsibilities.

B. RELATED PLANS

The Cayuse Mountain BAER Plan was reviewed for consistency with relevant plans and policies related to Spokane trust lands impacted by the fire. Below are brief descriptions of plans referenced in the development of the BAER Plan.

Integrated Resource Management Plan for the Spokane Indian Reservation, May 2008

The Integrated Resource Management Plan (IRMP) is a reservation-wide guide for land use and resource management that integrates goals for individual natural resources into a single plan. It assists Tribal resource programs and leadership in decision making regarding land use and resource management and guides the development and implementation of individual Resource Management Plans.

Final Environmental Impact Statement of the Spokane Tribe's Integrated Resource Management Plan for the Spokane Indian Reservation, May 2008

The Final Environmental Impact Statement (EIS) of the Spokane Tribe's IRMP for the Spokane Indian Reservation provides an analysis on environmental consequences of the alternatives. The EIS addresses issues and concerns raised during the public comment period and contains responses to oral testimony and letters received during the public comment period for the Draft Environmental Impact Statement. Five alternatives were evaluated and Alternative 3, Preserve All Future Use (PAFU) with outcome based performance was selected because it maximizes Tribal priorities and goals and minimizes irreversible and irretrievable commitment of resources and adverse impacts.

Fire Management Plan for the Spokane Indian Reservation, March 2006

The Fire Management Plan is a strategic document that defines a program to manage wildland fires, prescribed fires, fuels, emergency stabilization and rehabilitation and monitoring on the Spokane Indian

Reservation. This plan addresses a full range of fire management activities that support ecosystem sustainability, values to be protected, protection of firefighter and public safety, public health and environmental issues, and is consistent with resource management objectives and activities identified by tribal landowners and resource managers.

Environmental Assessment of the Spokane Indian Reservation Wildfire Management Plan, September 2005

The Environmental Assessment (EA) addresses alternatives and potential impacts of a Fire Management Plan for the Spokane Indian Reservation. The EA evaluated four alternatives including the Preferred Alternative (Suppression, Fuels Management, and Fire Prevention) and each alternative's direct, indirect and cumulative effects to the human environment.

Forest Management Plan for the Spokane Indian Reservation, June 2010

The Forest Management Plan provides guidance and direction on forestland management activities on the Spokane Indian Reservation for the period 2010-2025. The Forest Management Plan includes action plans for: timber harvest preparation, timber sale administration, forest development, fire preparedness, fire prevention, fuels management, and woodlands management.

Spokane Tribe of Indians Wildlife Area Mitigation Management Plan Draft, 2012

The Spokane Tribe of Indians Wildlife Area Mitigation Management Plan is a requirement of the Amended and Restated Spokane Tribe of Indians Wildlife Project Memorandum of Agreement between the Spokane Tribe and Department of Energy Bonneville Power Association. The Wildlife Area Mitigation Plan provides for management of the property to permanently achieve and maintain native habitat that supports indigenous wildlife species of the area, including Federally listed threatened and endangered species.

C. CUMULATIVE IMPACTS ANALYSIS

Cumulative effects are the environmental impacts resulting from the incremental impacts of a proposed action, when added to other past, present, and reasonably foreseeable future actions, both Federal and non-federal. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. The emergency stabilization and rehabilitation treatments for the areas affected by the Cayuse Mountain Fire, as proposed in the BAER Plan, do not result in an intensity of impact (i.e. major ground disturbance, etc.) that would cumulatively constitute a significant, detrimental impact on the quality of the environment. The treatments are consistent with the above jurisdictional management plans and associated environmental compliance documents of the BIA, Spokane Agency, Spokane Tribe and the attached Categorical Exclusion.

No direct or indirect unavoidable adverse impacts to the biological or physical environment would result from the implementation of the Cayuse Mountain BAER Plan. The implementation of BAER and monitoring treatment actions proposed in the plan would not result in any adverse effect on the burned area or areas downstream. Conversely, implementation of the plan would be expected to result in a cumulatively beneficial response based on BAER recovery efforts.

D. APPLICABLE AND RELEVANT CATEGORICAL EXCLUSIONS

The individual actions proposed in this plan are Categorically Excluded from further environmental analysis as provided for in the Department of Interior Manual Part 516 (Part 516 DM). All applicable and relevant Department of Interior and BIA Categorical Exclusions are listed below. Categorical Exclusion decisions were made with consideration given to the results of emergency consultations completed by the BAER Team and documented below.

Applicable Department of the Interior Categorical Exclusions

Part 516 DM 2 Appendix 1.6 Non-destructive data collection, inventory (including field, aerial and satellite surveying and mapping), study, research and monitoring activities.

Applicable Bureau of Indian Affairs Categorical Exclusions

Part 516 DM 10.5 A Operation, Maintenance, and Replacement of Existing Facilities
Examples are normal renovation of buildings, road maintenance and limited rehabilitation of irrigation structures.

Part 516 DM 10.5 H (6) Forestry
Approval of emergency and range rehabilitation plans when limited to environmental stabilization on less than 10,000 acres and not including approval of salvage sales of damaged timber.

Part 516 DM 10.5 L (4) Roads and Transportation.
Installation of fencing, signs, pavement markings, small passenger shelters, traffic signals, and railroad warning devices where no substantial land acquisition or traffic disruption will occur.

Part 516 DM 10.5 L (5) Roads and Transportation.
Emergency repairs under 23 U.S.C 125.

Part 516 DM 10.5 M (1) Other
Data gathering activities such as inventories, soil and range surveys, timber cruising, geological, geophysical, archaeological, paleontological and cadastral surveys.

Part 516 DM 10.5 M (2) Other
Establishment of non-disturbance environmental quality monitoring programs and field monitoring stations including testing services.

E. APPLICABLE LAWS AND EXECUTIVE ORDERS

This section documents consideration given to the requirements of specific environmental laws in the development of the Cayuse Mountain BAER Plan. Specific consultations initiated or completed during development and implementation of this plan are also documented. The following executive orders and legislative acts have been reviewed as they apply to the Cayuse Mountain BAER Plan.

National Historic Preservation Act (NHPA). Certain emergency stabilization and rehabilitation treatments may have the potential to affect significant cultural resources and thereby require the federal agency to comply with NHPA and as promulgated under 36 CFR Part 800. To assist the Agency in meeting NHPA compliance, the Spokane Tribe's Historic Preservation Office was notified and informed that a BAER team was preparing a plan to address issues that were identified concerning potential post-fire risks to human life, property and important cultural and natural resources from the Cayuse Mountain Fire. It was determined that there were proposed emergency stabilization and rehabilitation treatments that may impact significant cultural resources, thus requiring

further consultation under Section 106 of the NHPA. These consultations have been included in the treatment specifications.

Executive Order 11988, Floodplain Management. No proposed treatments would occupy or modify floodplains and all proposed treatments are in compliance with this order.

Executive Order 11990, Protection of Wetlands. No proposed treatments would result in long-term impacts to or loss of wetlands and all proposed treatments are in compliance with this order.

Executive Order 12372, Intergovernmental Review. Coordination and consultation is ongoing with the affected Tribe, Federal, and local agencies. A copy of the BAER Plan will be disseminated to all affected parties.

Executive Order 12892, Federal actions to address Environmental Justice in Minority and Low-Income Populations. All Federal actions must address and identify, as appropriate, disproportionately high and adverse human health or low-income populations, and Indian Tribes in the United States. The BAER Team has determined that the actions proposed in this plan will result in no adverse human health or environmental effects for minority or low-income populations and Indian Tribes.

Endangered Species Act. A species list was requested and received from the US Fish and Wildlife Services' office and is included in the supporting documentation. The species list indicates no critical habitat has been designated on the Spokane Indian Reservation. After review of the listed species, wildlife resource assessment, and proposed treatments, it was determined that the activities proposed in this BAER Plan will have no effect on Federally listed species.

Clean Water Act. All proposed treatments are in compliance with this Act. Long term impacts from restoration and emergency stabilization measures proposed are considered beneficial to water quality.

Clean Air Act. Federal Ambient Air Quality Primary and Secondary Standards are provided by the National Ambient Air Quality Standards (NAAQS), as established by the U.S. Environmental Protection Agency (EPA) (Clean Air Act, 42 U.S.C. 7470, et seq., as amended). Designations for air quality have been determined throughout the country as either Class I, Class II or Class III. Each class allows increased pollutant concentrations, called Prevention of Significant Deterioration (PSD) Increments [40 CFR 52.21(c)] as you move from Class I to Class III, but none are allowed to exceed the NAAQS.

In 1991 the Spokane Tribe was approved for a re-designation from Class II to the more restrictive Class I air quality standard. This re-designation determines the amount of pollution that is allowed from both on and off reservation sources and protects the air quality on the Reservation, allowing the Spokane Tribe to impose the most stringent control requirements on nearby sources. This is done by reviewing permits for new sources and modifications to existing sources that may impact our air quality.

The BAER Team has determined that treatments prescribed in this BAER Plan do not require a state permit but may have short-term minor impacts to air quality due to equipment emissions and/or increase in particulates during ground-based activities. However this activity would not differ significantly from routine land use practices for the area. As such, all proposed treatments are in compliance with this Act.

F. CONSULTATIONS

BAER Team members attended an in-briefing in Wellpinit, WA on Thursday, September 1, 2016 to obtain information on issues of concern as a result of the Cayuse Mountain Fire. The BAER Team was provided contact information for natural resources staff from the Spokane Tribe and

Spokane Agency. Attendees were primarily Tribal natural resources staff. Internal scoping continued daily by the BAER Team at each evening briefing as new issues found in the field were identified and discussed. Issues and concerns were brought up by agency and Tribal employees throughout the BAER process.

Others consulted:

- Andy Moss, Spokane Tribe, Water and Fish
- Brian Crossley, Spokane Tribe, Water and Fish
- BJ Kieffer, Spokane Tribe, Department of Natural Resources
- Kevin Ritzer, Spokane Tribe, Fuels Management
- Jacob Turner, Spokane Tribe, Wildlife Program
- Chad McCrea, Spokane Tribe, Wildlife Program
- Blaine Kieffer, Spokane Tribe, Fire Management

G. SUMMARY OF COMPLIANCE DOCUMENTATION

The following table summarizes the NEPA compliance in place for the emergency stabilization (ES) and rehabilitation (BAR) treatments proposed for the Cayuse Mountain BAER Plan.

Treatment or Action		NEPA documentation (EIS, EA, or CE)
ES 1.	Hazard Warning Signs	NEPA compliance tiers from the Fire Management Plan 2006, EA and FONSI; and Integrated Resource Management Plan and EIS, 2008. Site specific CE: Part 516 DM 10.5 H (6); Part 516 DM 10.5 L (4).
ES 2.	Storm Patrol	NEPA compliance tiers from the Fire Management Plan 2006, EA and FONSI; and Integrated Resource Management Plan and EIS, 2008. Site specific CE: Part 516 DM 10.5 H (6); Part 516 DM 10.5 A.
ES 3.	Invasive Species Assessment	NEPA compliance tiers from the Fire Management Plan 2006, EA and FONSI; and Integrated Resource Management Plan and EIS, 2008. Site specific CE: Part 516 DM 10.5 H (6); Part 516 DM 10.5 M (1).
ES 4.	Invasive Species Control	NEPA compliance tiers from the Fire Management Plan 2006, EA and FONSI; and Integrated Resource Management Plan and EIS, 2008. Site specific CE: Part 516 DM 10.5 H (6). As described in the IRMP 2008, Safety Data Sheets (SDS) of proposed herbicides must be provided to Spokane Tribe's Interdisciplinary Team for review and approval, prior to their use and application.
ES 5.	Floatable Debris Assessment	NEPA compliance tiers from the Fire Management Plan 2006, EA and FONSI; and Integrated Resource Management Plan and EIS, 2008. Site specific CE: Part 516 DM 10.5 H (6).
ES 6.	Cemetery Fence Construction	NEPA compliance tiers from the Fire Management Plan 2006, EA and FONSI; and Integrated Resource Management Plan and EIS, 2008. Site specific CE: Part 516 DM 10.5 H (6).
ES 7.	Tree Hazard Assessment	NEPA compliance tiers from the Fire Management Plan 2006, EA and FONSI; and Integrated Resource Management Plan and EIS, 2008. Site specific CE: Part 516 DM 10.5 H (6); Part 516 DM 10.5 M (1).
ES 8.	Tree Hazard Mitigation	NEPA compliance tiers from the Fire Management Plan 2006, EA and FONSI; and Integrated Resource Management Plan and EIS, 2008. Site specific CE: Part 516 DM 10.5 H (6).
ES 9.	Guard Rail and Sign Replacement	NEPA compliance tiers from the Fire Management Plan 2006, EA and FONSI; and Integrated Resource Management Plan and EIS, 2008. Site specific CE: Part 516 DM 10.5 H (6); Part 516 DM 10.5 L (5).
ES 10.	Structure Protection	NEPA compliance tiers from the Fire Management Plan 2006, EA and FONSI; and Integrated Resource Management Plan and EIS, 2008. Site specific CE: Part 516 DM 10.5 H (6).

ES 11.	Project Administration	NEPA compliance tiers from the Fire Management Plan 2006, EA and FONSI; and Integrated Resource Management Plan and EIS, 2008. Site specific CE: Part 516 DM 10.5 H (6); Part 516 DM 10.5 M (1).
BAR 1.	Reforestation	NEPA compliance tiers from the Forest Management Plan 2010; and Integrated Resource Management Plan and EIS, 2008. Site specific CE: Part 516 DM 10.5 H (6); Acreages and locations are still being determined and if outside of previously surveyed timber sales will require Section 106 compliance.
BAR 2.	Stocking Surveys	NEPA compliance tiers from the Forest Management Plan 2010; and Integrated Resource Management Plan and EIS, 2008. Site specific CE: Part 516 DM 10.5 H (6); Part 516 DM 10.5 M (1).
BAR 3.	CFI Plot Reestablishment	NEPA compliance tiers from the Forest Management Plan 2010; and Integrated Resource Management Plan and EIS, 2008. Site specific CE: Part 516 DM 10.5 H (6). Part 516 DM 10.5 M (1); Part 516 DM 10.5 M (2).
BAR 4.	Pit Toilet Replacement	NEPA compliance tiers from the Forest Management Plan 2010; and Integrated Resource Management Plan and EIS, 2008. Site specific CE: Part 516 DM 10.5 A.
BAR 5.	Archaeological Survey of Reforestation Locations	NEPA compliance tiers from the Fire Management Plan 2006, EA and FONSI; and Integrated Resource Management Plan and EIS, 2008. Site specific CE: Part 516 DM 10.5 H (6); Part 516 DM 10.5 M (1).

H. STATEMENT OF COMPLIANCE

The CEQ Regulations at 40 CFR 1508.4 require agencies to consider whether fairly routine actions involve extraordinary circumstances that, per NEPA, trigger an agency to prepare additional assessment and consideration. If it is determined that any of the exemptions listed in 516 DM Appendix 2 apply to a proposed action, that action may not be categorically excluded, and an Environmental Assessment or an Environmental Impact Statement must be prepared. All treatments that are proposed as a Categorical Exclusion for the Cayuse Mountain BAER Plan have been compared against the list of extraordinary circumstances and were found not to trigger any exceptions.

I have reviewed the proposed treatments in the Cayuse Mountain BAER Plan in accordance with the criteria discussed above and have determined that the proposed actions and planned mitigation qualify as BIA Categorical Exclusions and would not result in any significant effect on the environment. BAER Team specialists have completed necessary coordination and consultation to ensure compliance with the National Historic Preservation Act, Endangered Species Act and other Federal, State and local environmental review requirements. As such, all treatments are approved for implementation.

Prepared by: Juliette Jeanne, Cayuse Mountain, Interagency BAER Team

Approved:

Dale Sebastian, Superintendent (Acting), Spokane Agency

Date



EXCEPTION CHECKLIST FOR BIA CATEGORICAL EXCLUSIONS

Project: Cayuse Mountain Burned Area Emergency Response (BAER) Plan

Date: 9/9/2016

Nature of Proposed Action: Approval and implementation of treatments in the Cayuse Mountain BAER Plan.

Part 516 DM 2 Appendix 1.6 Categorical Exclusions:

Non-destructive data collection, inventory (including field, aerial and satellite surveying and mapping), study, research and monitoring activities.

Part 516 DM 10.5 Categorical Exclusions:

- A Operation, Maintenance, and Replacement of Existing Facilities
Examples are normal renovation of buildings, road maintenance and limited rehabilitation of irrigation structures.

- H (6) Forestry
Approval of emergency and range rehabilitation plans when limited to environmental stabilization on less than 10,000 acres and not including approval of salvage sales of damaged timber.

- L (4) Roads and Transportation.
Installation of fencing, signs, pavement markings, small passenger shelters, traffic signals, and railroad warning devices where no substantial land acquisition or traffic disruption will occur.

- L (5) Roads and Transportation.
Emergency repairs under 23 U.S.C 125.

- M (1) Other
Data gathering activities such as inventories, soil and range surveys, timber cruising, geological, geophysical, archaeological, paleontological and cadastral surveys.

- M (2) Other
Establishment of non-disturbance environmental quality monitoring programs and field monitoring stations including testing services.

Evaluation of Exception to use of Categorical Exclusion

- 1. This action would have significant adverse effects on public health or safety. No Yes
- 2. This action would have an adverse effect on unique geographical features, such as wetland, wild or scenic rivers, refuges, floodplains, rivers placed on nationwide river inventory, or prime or unique farmlands. No Yes
- 3. The action will have highly controversial environmental effects. No Yes
- 4. The action will have highly uncertain environmental effects or involve unique or unknown environmental risks. No Yes
- 5. This action will establish a precedent for future actions. No Yes
- 6. This action is related to other actions with individually insignificant, but cumulatively significant environmental effects. No Yes
- 7. This action will affect properties listed or eligible for listing in the National Register of Historic Places. No Yes
- 8. This action will affect a species listed, or proposed to be listed as endangered or threatened. No Yes
- 9. This action threatens to violate federal, state, local, or tribal law or requirements imposed for protection of the environment. No Yes
- 10. This action will have a disproportionately high and adverse effect on low income or minority populations. No Yes
- 11. This action will limit access to, and ceremonial use of Indian sacred sites on federal lands by Indian religious practitioners, or significantly adversely affect the physical integrity of such sacred sites. No Yes
- 12. This action will contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species known to occur in the area, or may promote the introduction growth, or expansion of the range of such species. No Yes

A "yes" to any of the above exceptions will require that an EA be prepared.

NEPA Action --- CE X EA _____

Preparer's Name and Title: Juliette Jeanne, Interagency BAER Team

Concur: H. Dan Hall
Act. of Northwest Region Archaeologist Concurrence with Item 7

Date: 09-08-2016

Approved: [Signature]
Spokane Agency Superintendent (Acting)

Date: 9/9/16

BURNED AREA EMERGENCY RESPONSE PLAN

2016 CAYUSE MOUNTAIN FIRE

APPENDIX III PHOTO DOCUMENTATION



View south towards Flett-Raymond watershed

Watershed Resource



Low burn severity around intersection of Flett Road and Elijah Road.



Moderate-to-high burn severity north of Cayuse Mountain.



View of home sites on alluvial fans and terraces along Wynecoop Road. Low burn severity on escarpment to west (left); moderate to high burn severity in watershed to east (right).



Moderate burn severity in rocky watersheds above Wynecoop Road.



Condition of burned watersheds above homes and boat launch on Wynecoop Road.

Watershed Resource



Talus slope in upper Raymond-Wynecoop Canyon.



Burned pre-fire log jam above culvert along Elijah Road.



Burned-over uranium prospect trench west of racetrack.



View west of restored Sherwood uranium mine. No fire effects.



Bull Pasture road blow out from May 21, 2016 storm.



Scoured drainages on Cayuse Mountain and debris flow deposits in pasture, May 21, 2016.

Forest Vegetation Resources



Light mortality class (0-25% Mortality)



Very high mortality class (>75% Mortality)



Imminent tree hazard caused by the fire



Vegetation recovery in 2015 Carpenter Road Fire



Close up of browsed recovering vegetation in 2015 Carpenter Road Fire

Cultural Resources



View of Coyote Rocks showing light burn severity.



View of collapsed Washington house showing complete destruction of site.



Aerial view of western area of fire area with pre-contact site and old wagon road up the drainage showing mosaic burn pattern.



Assessing fire impacts on talus pit location.



Riverside view of pre-contact site shown above showing light burn severity.



View of burned fence posts at Stevens Cemetery.

Public Safety Infrastructure



Damaged guard rail on Sherwood Mine road



Damaged warning sign on Wellpinit/Ford highway



Damaged speed limit sign on Sherwood Mine road



Pit toilet destroyed by fire at No Docks recreation area

Wildlife and Range



Wildlife Mitigation fencing damaged by the fire.



Before and after pictures of the fire across the Peaks Property



Signs of regrowth 10 days after the fire

BURNED AREA EMERGENCY RESPONSE PLAN
2016 CAYUSE MOUNTAIN FIRE

APPENDIX IV MAPS








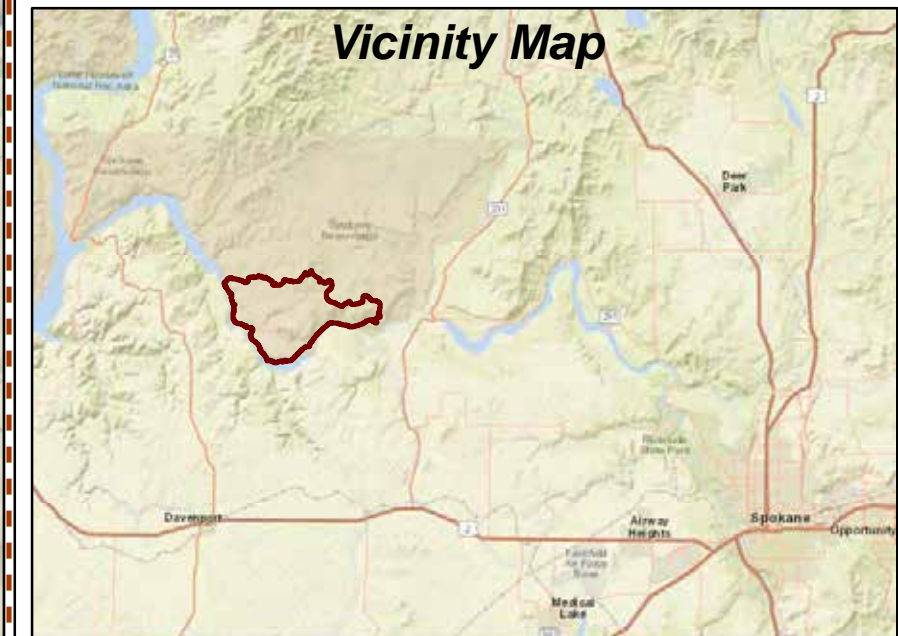
View of Sherwood reclaimed mine



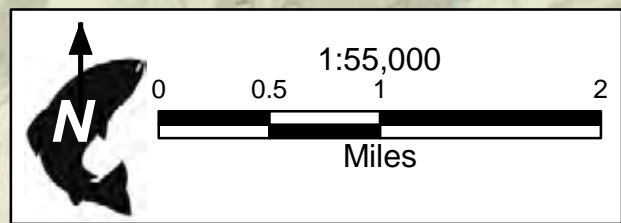
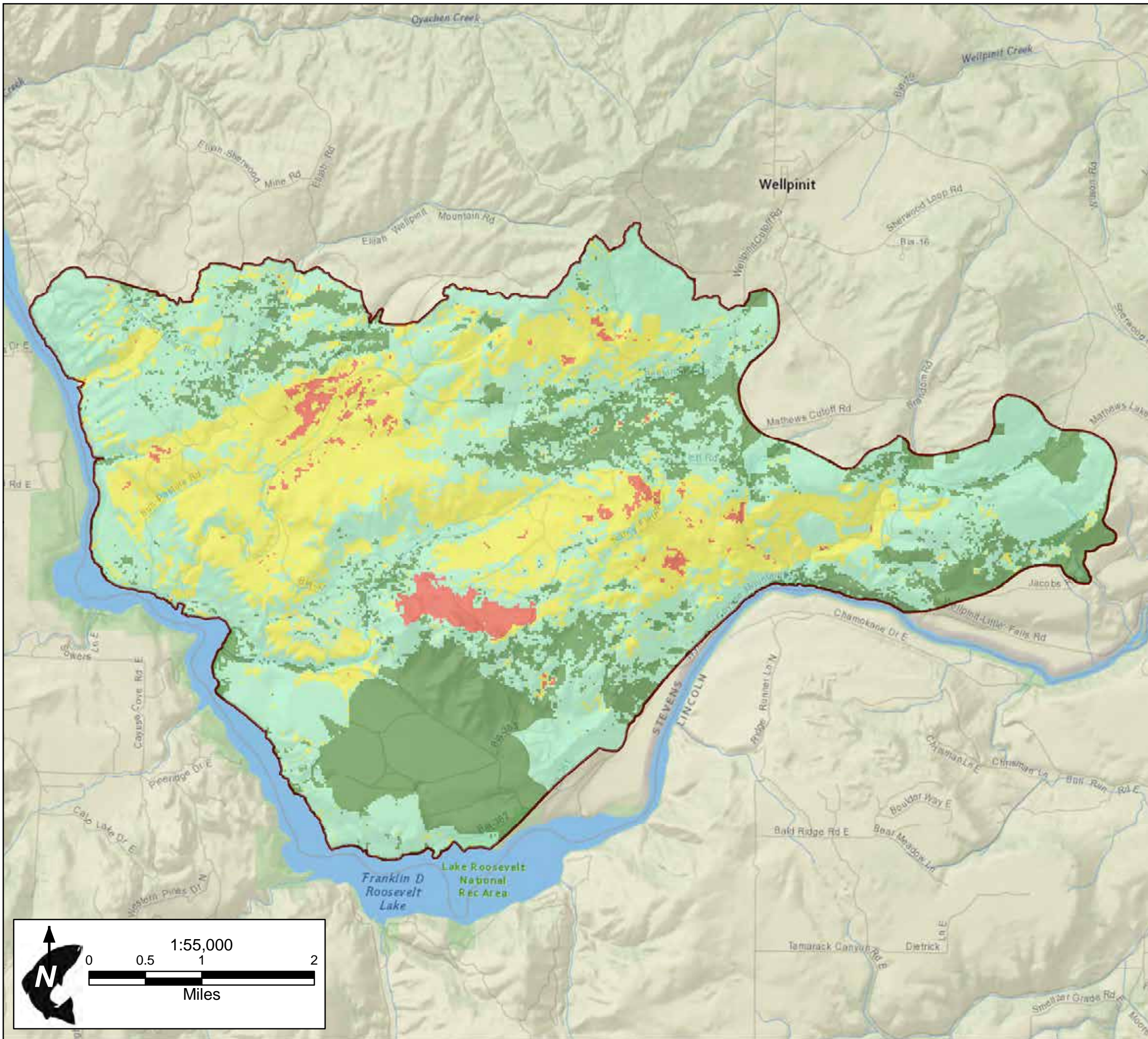
Cayuse Mountain Fire

Burn Severity

-  Unburned / Very Low
-  Low
-  Moderate
-  High
-  Fire Perimeter








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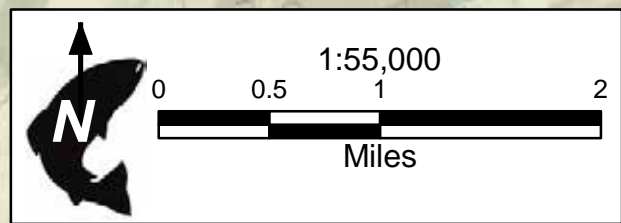
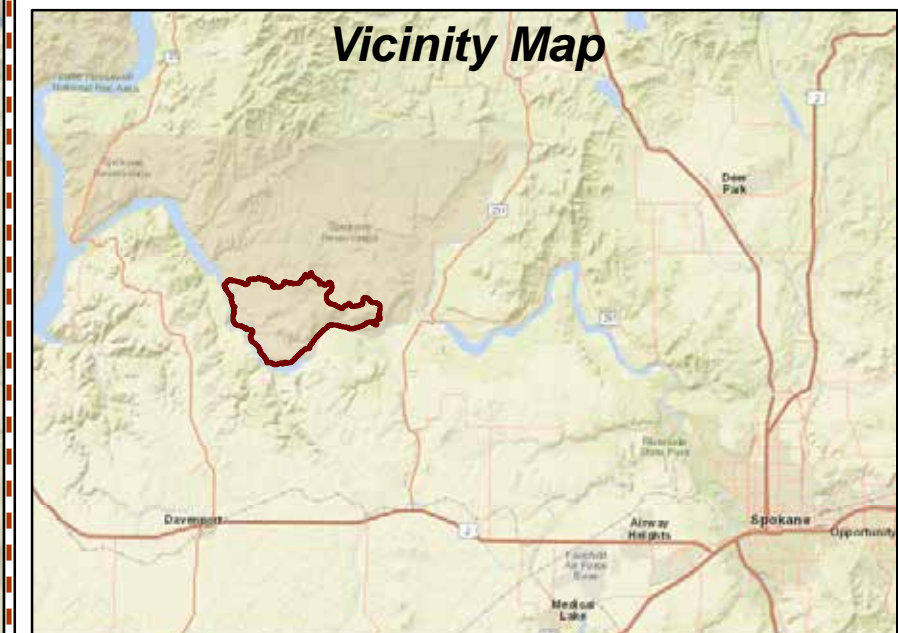
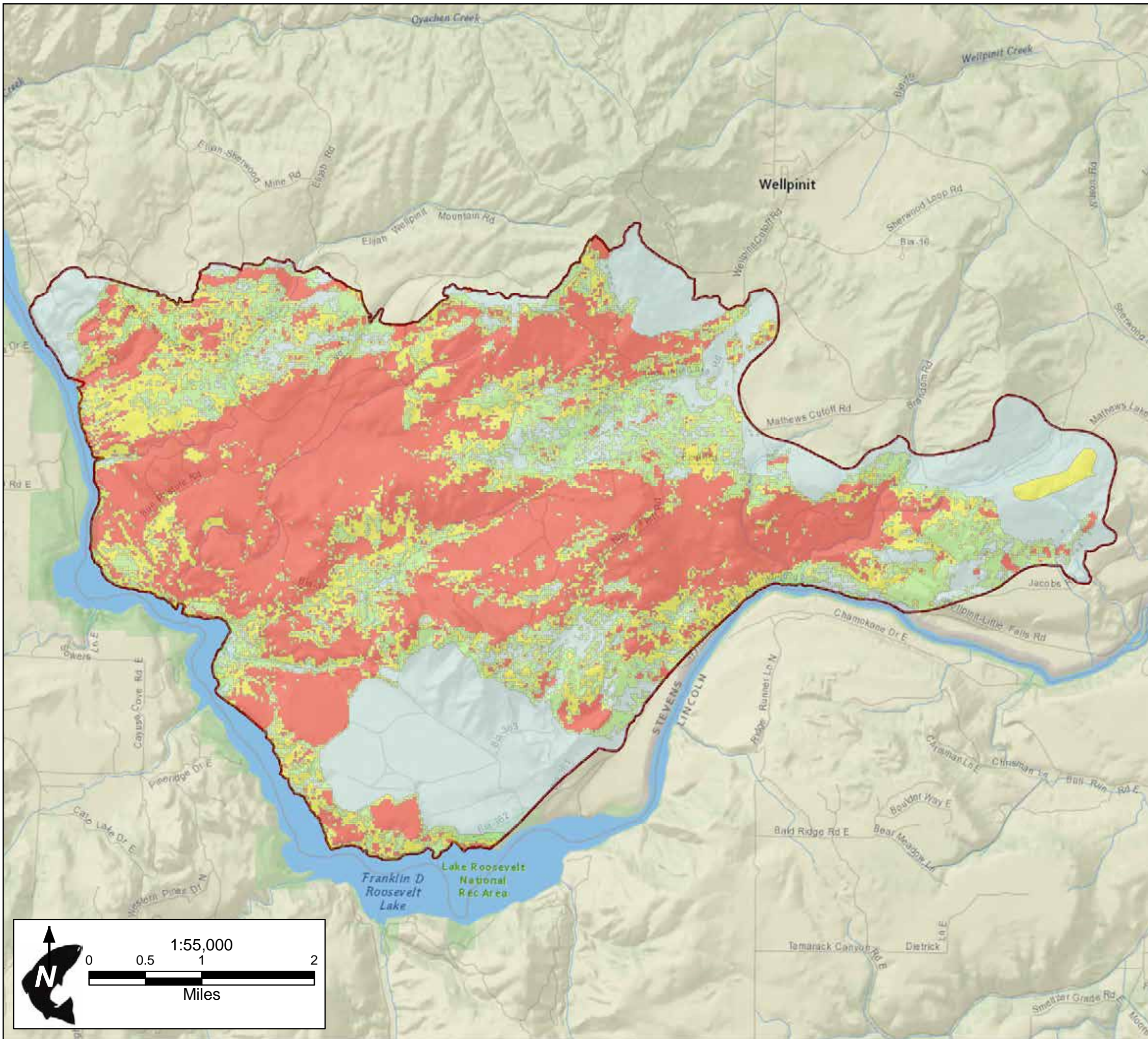




Cayuse Mountain Fire

Vegetation Mortality / Top Kill

-  Low: 0-25% Mortality
-  Moderate Low: 25-50% Mortality
-  High: 50-75% Mortality
-  Very High: >75% Mortality
-  Fire Perimeter









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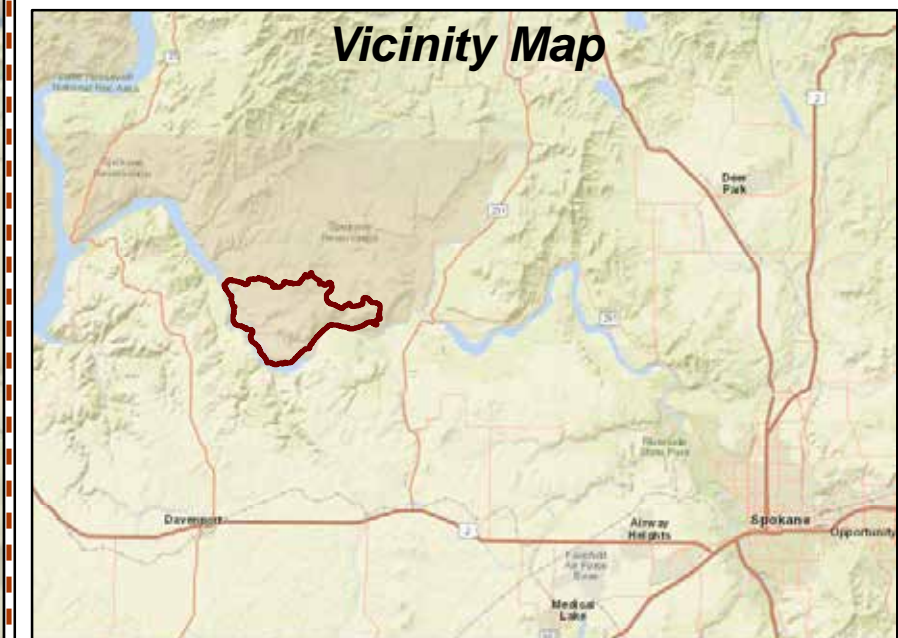




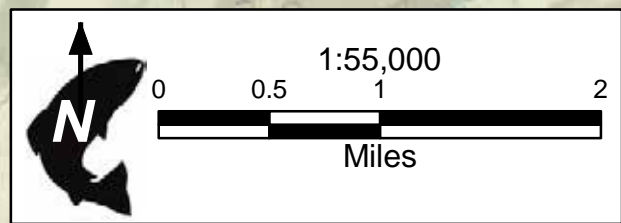
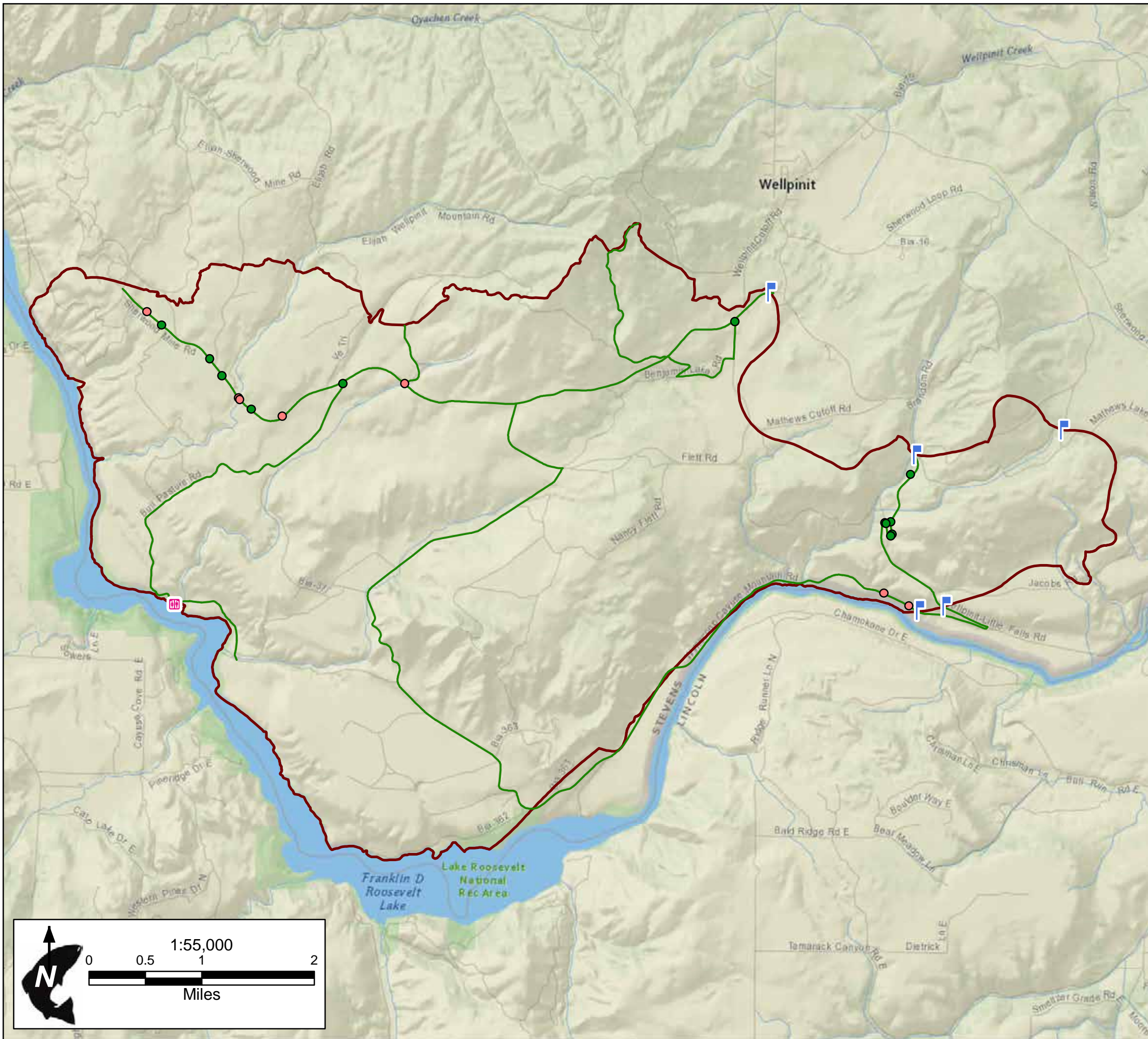
Cayuse Mountain Fire

Treatments

-  Flood Warning Signs
-  Road Signage
-  Guard Rails
-  Pit Toilet
-  Storm Patrol and Culvert Clean Out
-  Fire Perimeter



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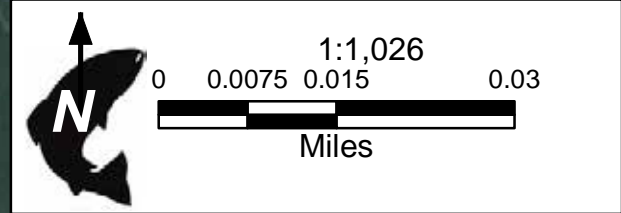
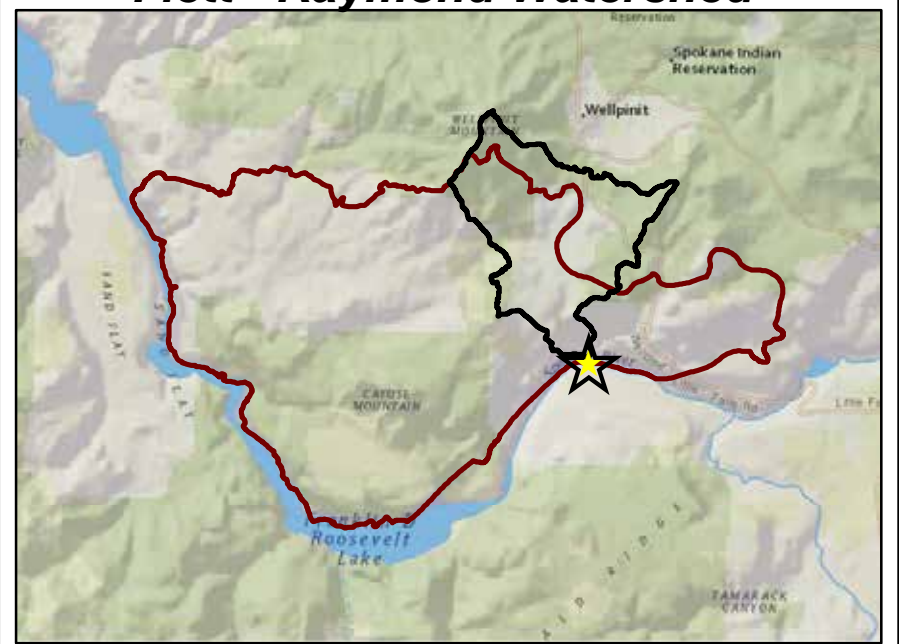


Cayuse Mountain Fire

Structure Protection

- Barrier Placement
- Stream

Vicinity Map Flett - Raymond Watershed



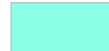

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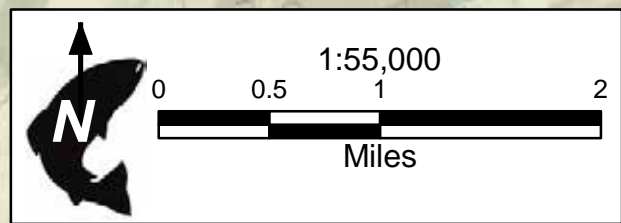
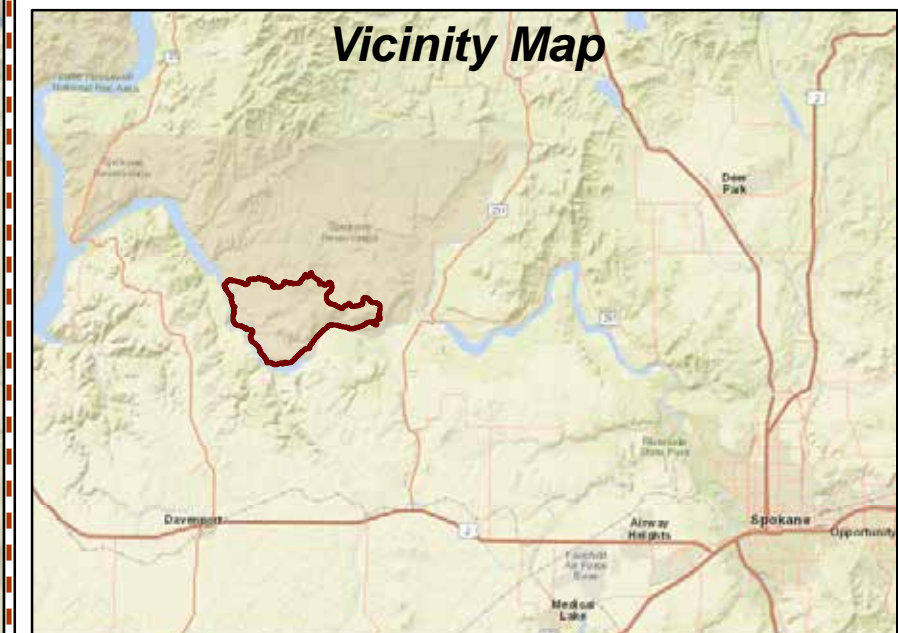
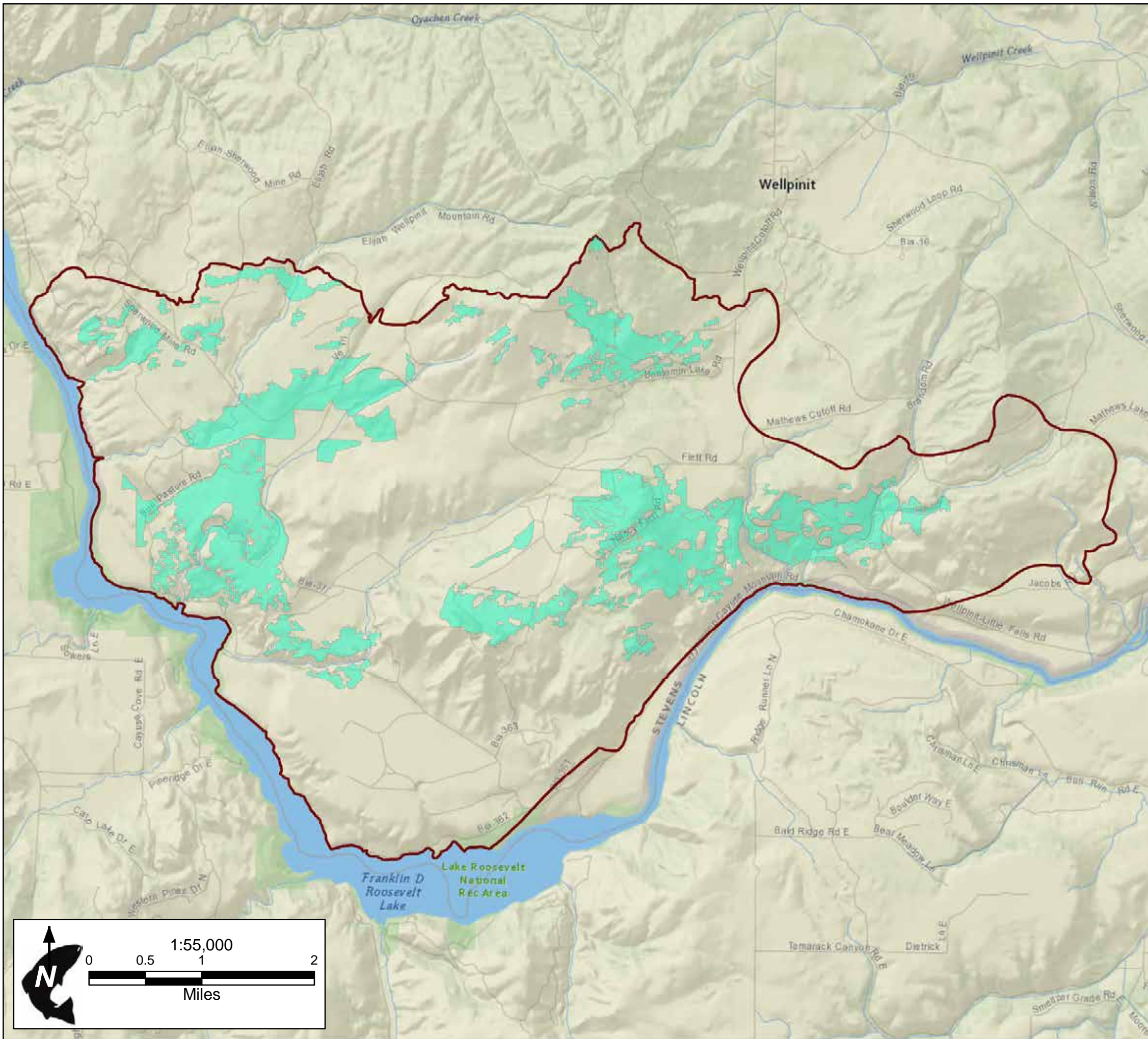




Cayuse Mountain Fire

Reforestation

-  Reforestation
-  Fire Perimeter



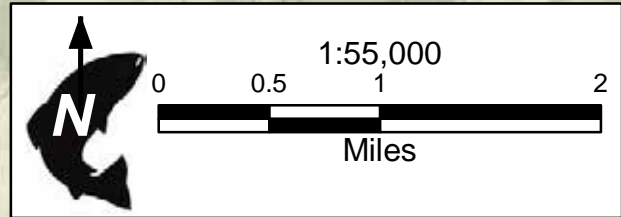
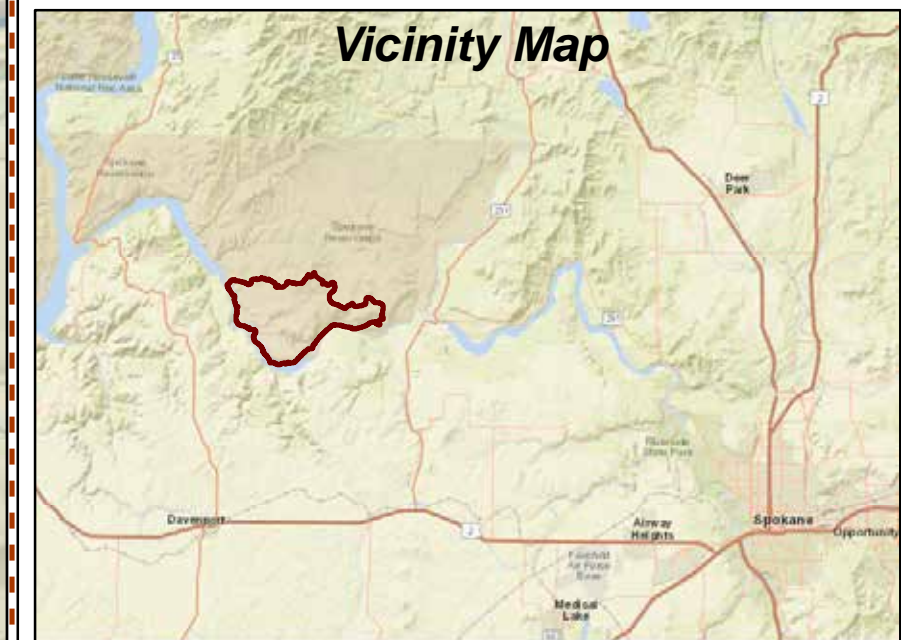
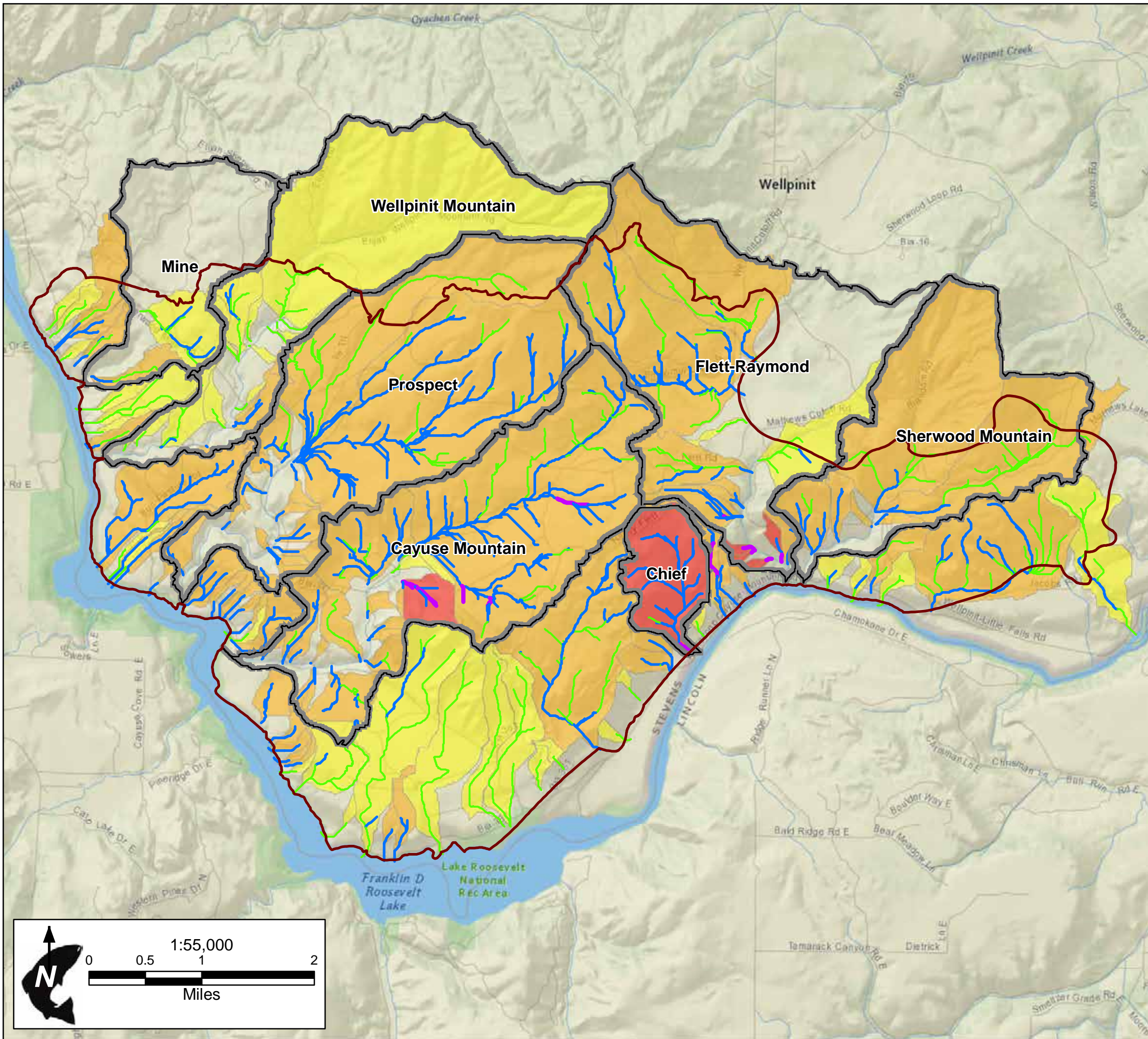
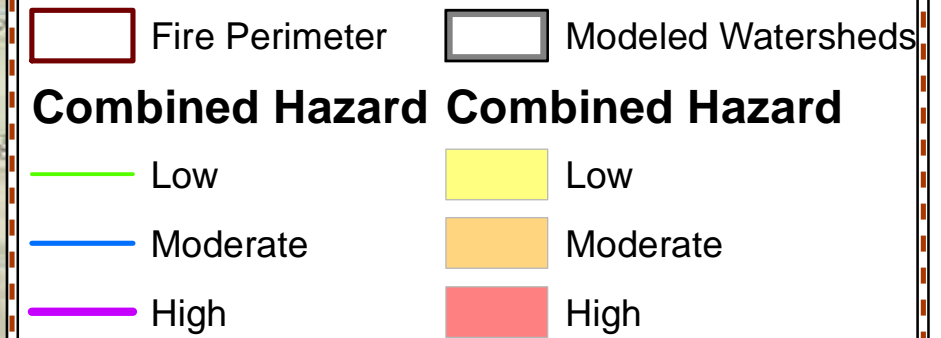
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Cayuse Mountain Fire

Debris Flow Combined Hazard



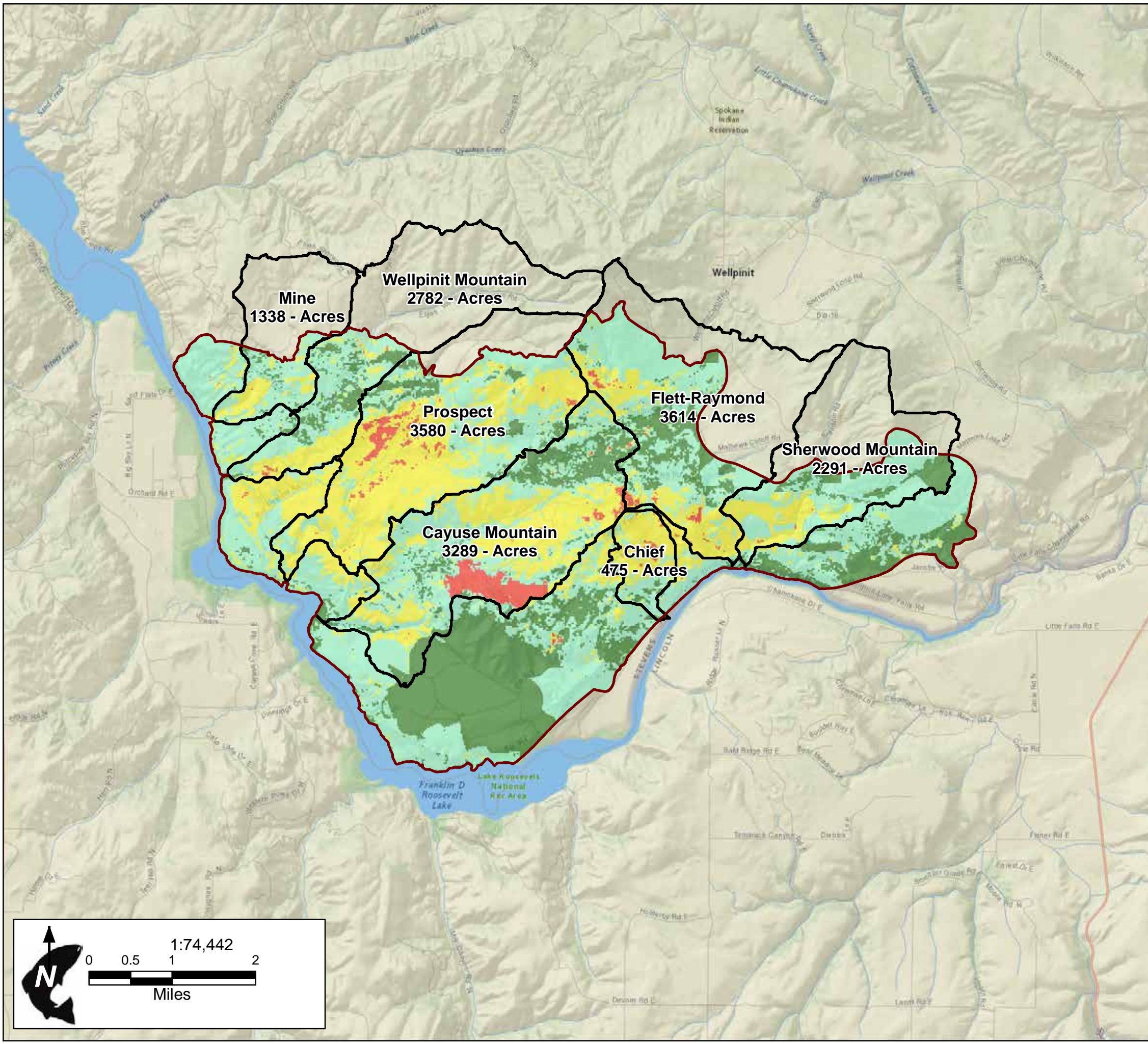
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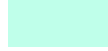




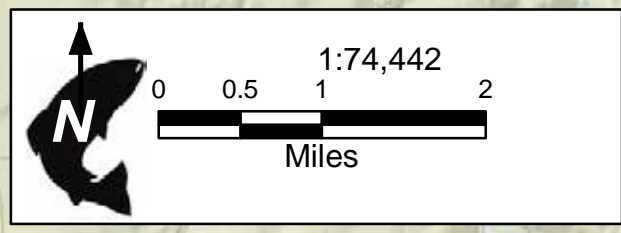
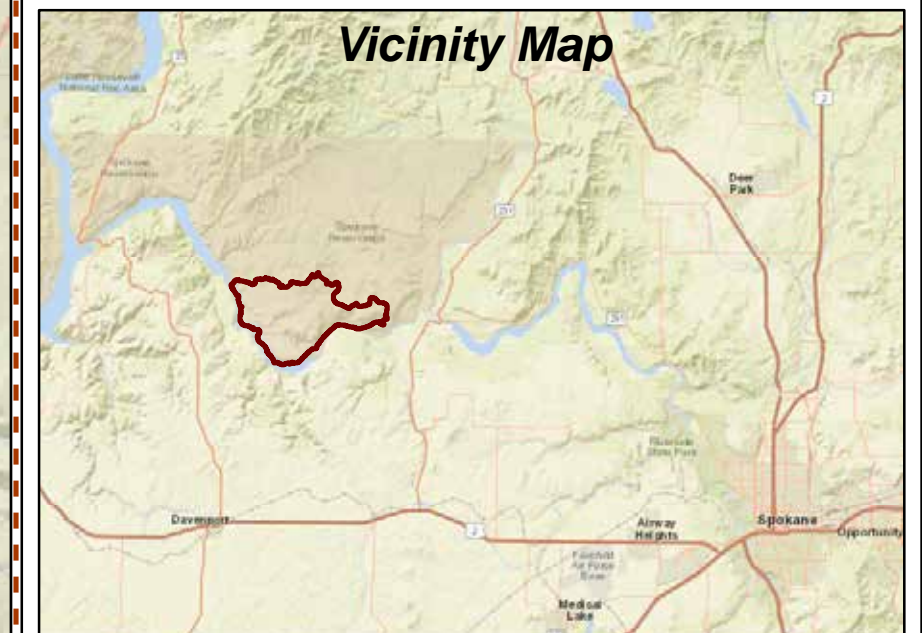


Cayuse Mountain Fire

Modeled Watersheds and Soil Burn Severity



-  Fire Perimeter
-  Modeled Watersheds
- Burn Severity**
-  Unburned / Very Low
-  Low
-  Moderate
-  High

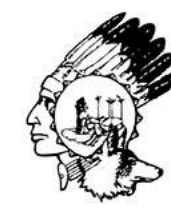


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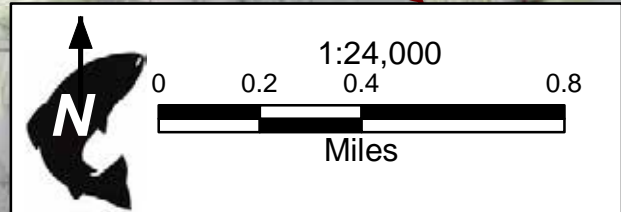
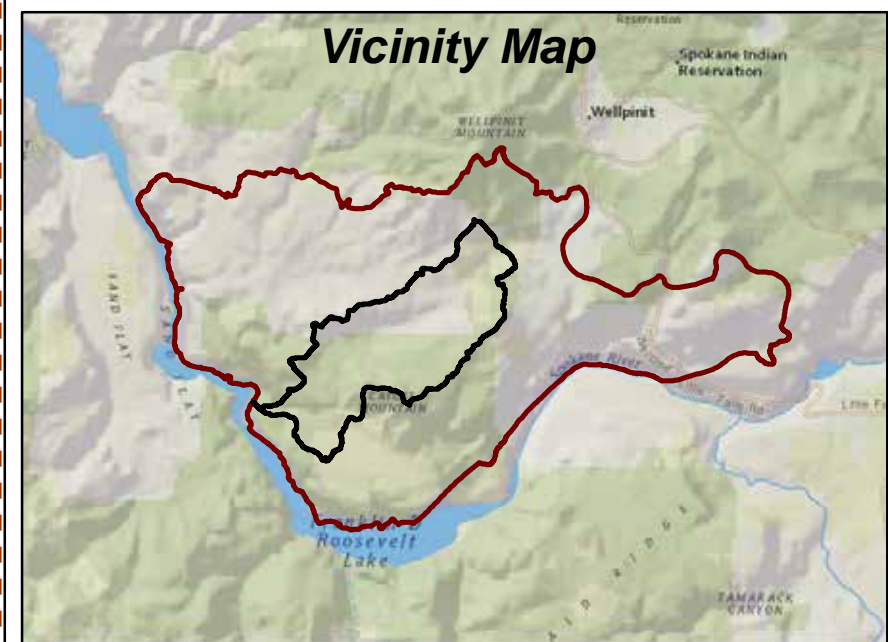
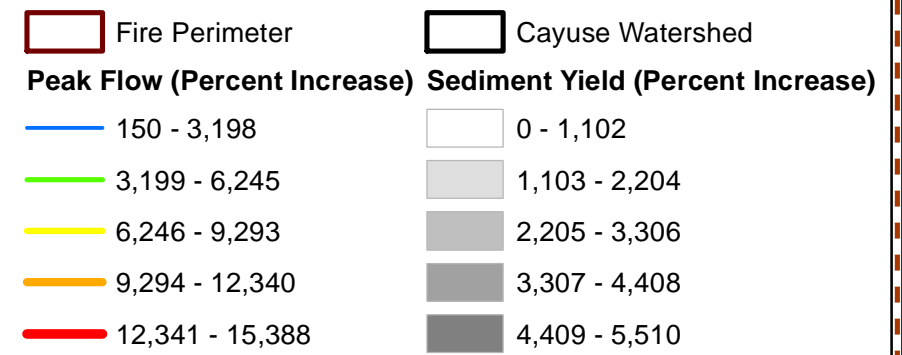
Cayuse Watershed - 3,289 Acres
10-Year, 1-Hour Storm Event
(0.6" of Rainfall)

869% Increase Peak Flow
 930% Increase Sediment Yield



Cayuse Mountain Fire

Cayuse Watershed Response



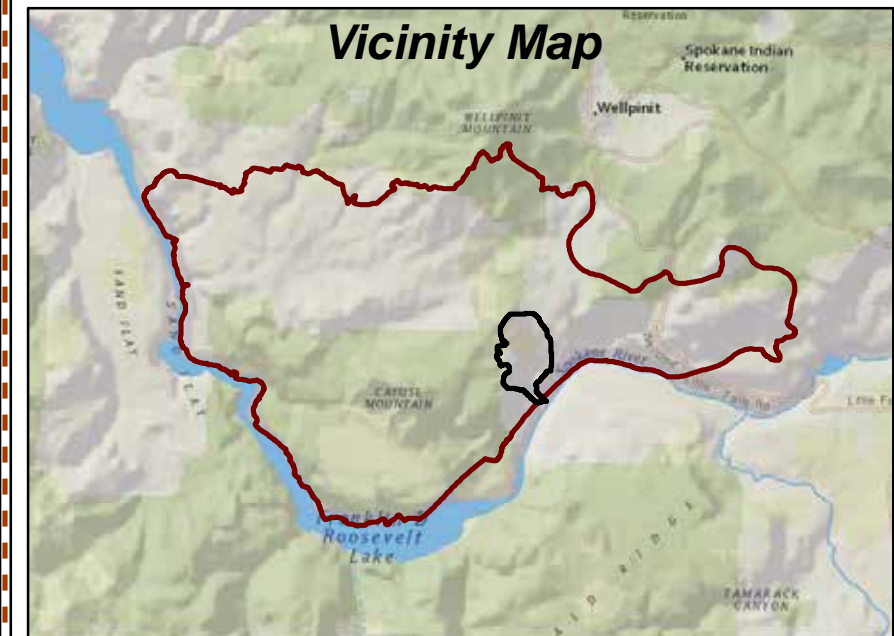
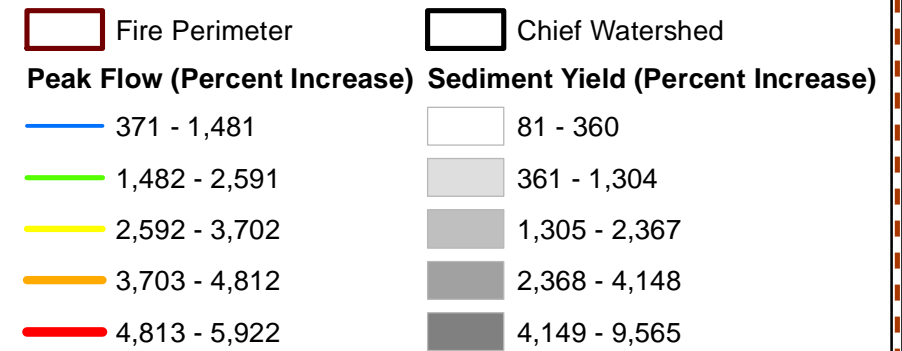
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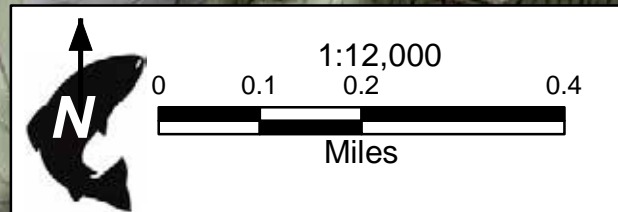
Cayuse Mountain Fire

Chief Watershed Response



Chief Watershed - 475 Acres
10-Year, 1-Hour Storm Event
(0.6" of Rainfall)

4,315% Increase Peak Flow
 5,754% Increase Sediment Yield



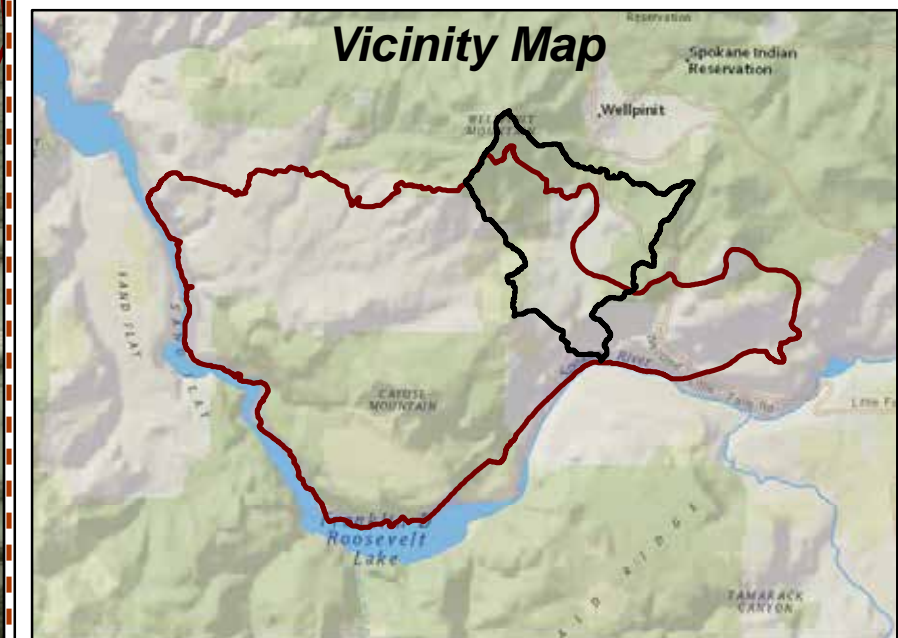
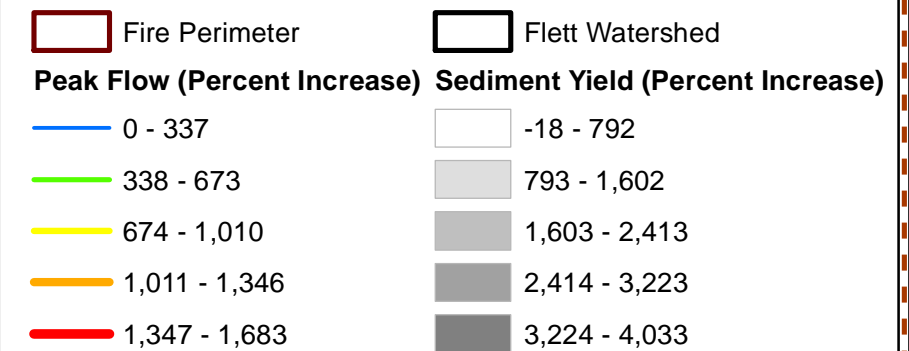
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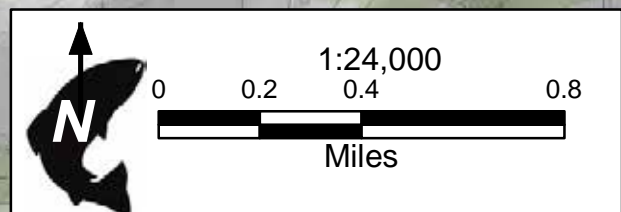
Cayuse Mountain Fire

Flett - Raymond Watershed Response



Flett Watershed - 3,614 Acres
10-Year, 1-Hour Storm Event
(0.6" of Rainfall)

305% Increase Peak Flow
 19% Increase Sediment Yield



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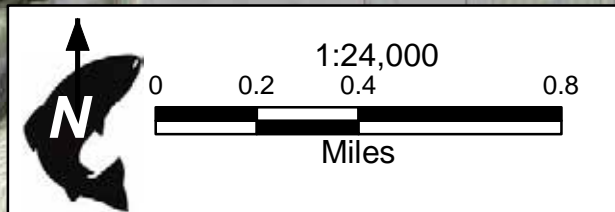


Cayuse Mountain Fire

Mine Watershed Response

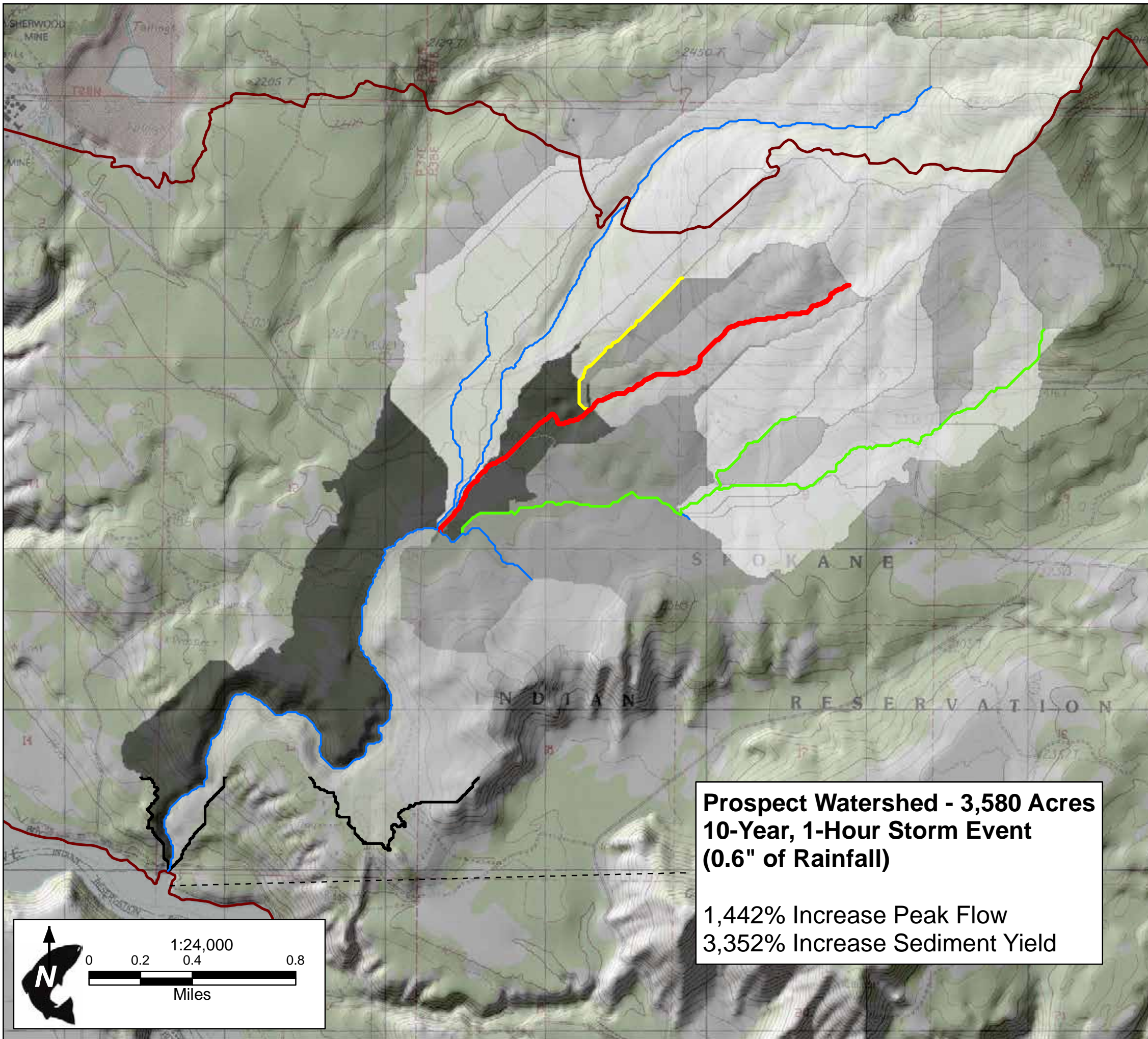
Mine Watershed - 1,338 Acres
10-Year, 1-Hour Storm Event
(0.6" of Rainfall)

88% Increase Peak Flow
 366% Increase Sediment Yield



No warranty expressed or implied is made regarding the accuracy or utility of the data and information on this map.





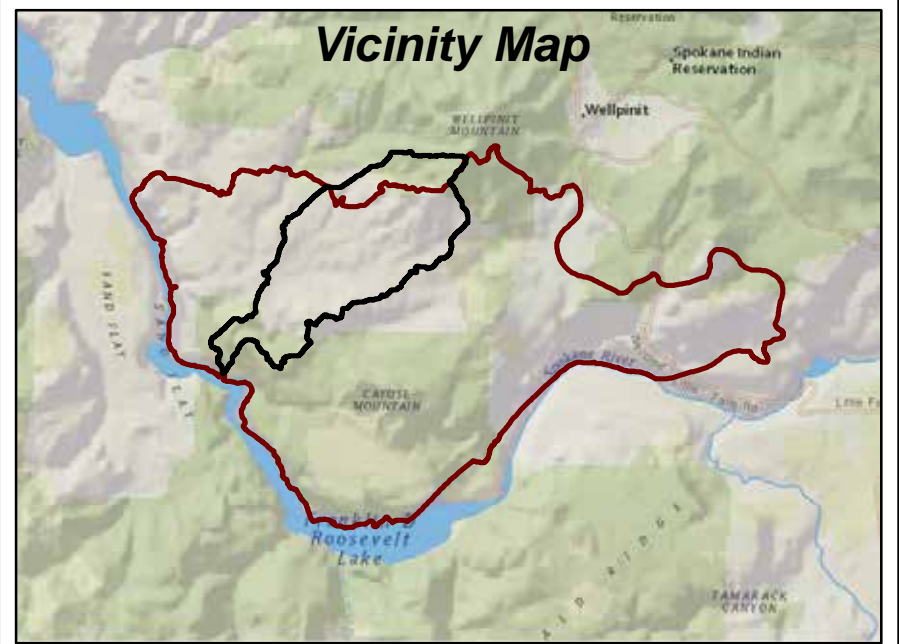
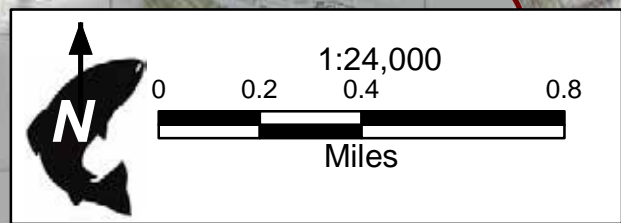
Cayuse Mountain Fire

Prospect Watershed Response

Fire Perimeter	Prospect Watershed
Peak Flow (Percent Increase)	Sediment Yield (Percent Increase)
8 - 1,719	1 - 911
1,720 - 3,430	912 - 1,821
3,431 - 5,142	1,822 - 2,732
5,143 - 6,853	2,733 - 3,642
6,854 - 8,564	3,643 - 4,552

Prospect Watershed - 3,580 Acres
10-Year, 1-Hour Storm Event
(0.6" of Rainfall)

1,442% Increase Peak Flow
 3,352% Increase Sediment Yield



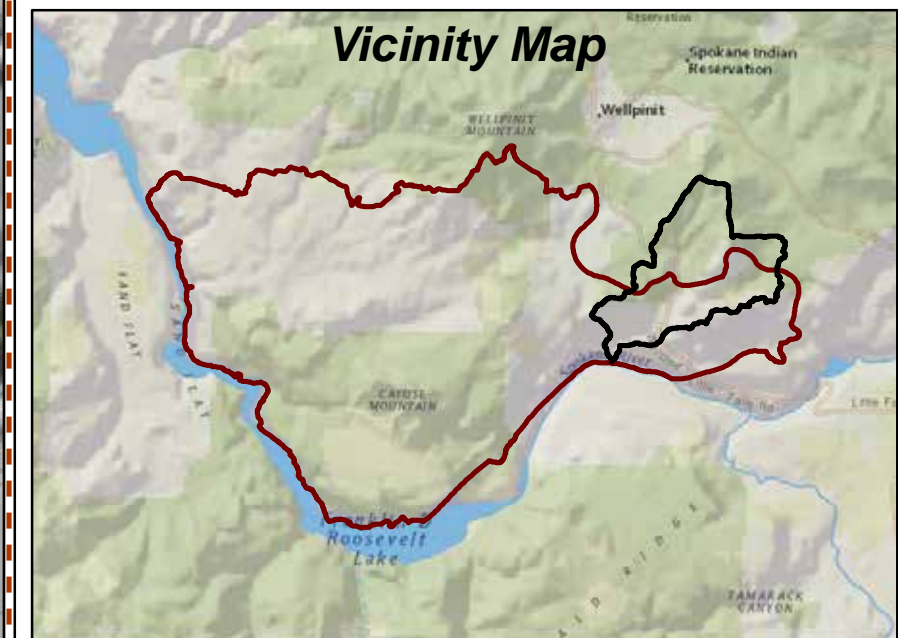
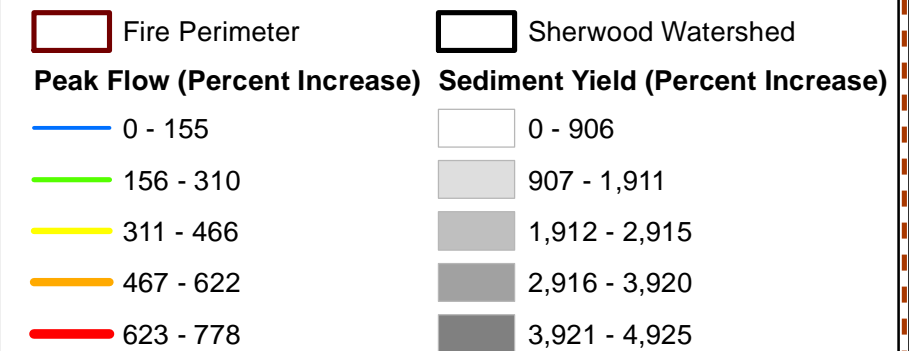
No warranty expressed or implied is made regarding the accuracy or utility of the data and information on this map.





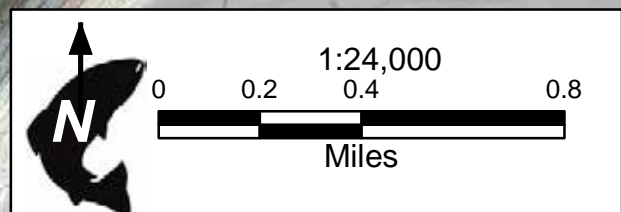
Cayuse Mountain Fire

Sherwood Mountain Watershed Response



Sherwood Watershed - 2,291 Acres
10-Year, 1-Hour Storm Event
(0.6" of Rainfall)

317% Increase Peak Flow
 461% Increase Sediment Yield



No warranty expressed or implied is made regarding the accuracy or utility of the data and information on this map.



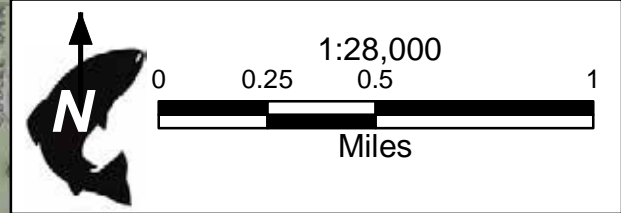
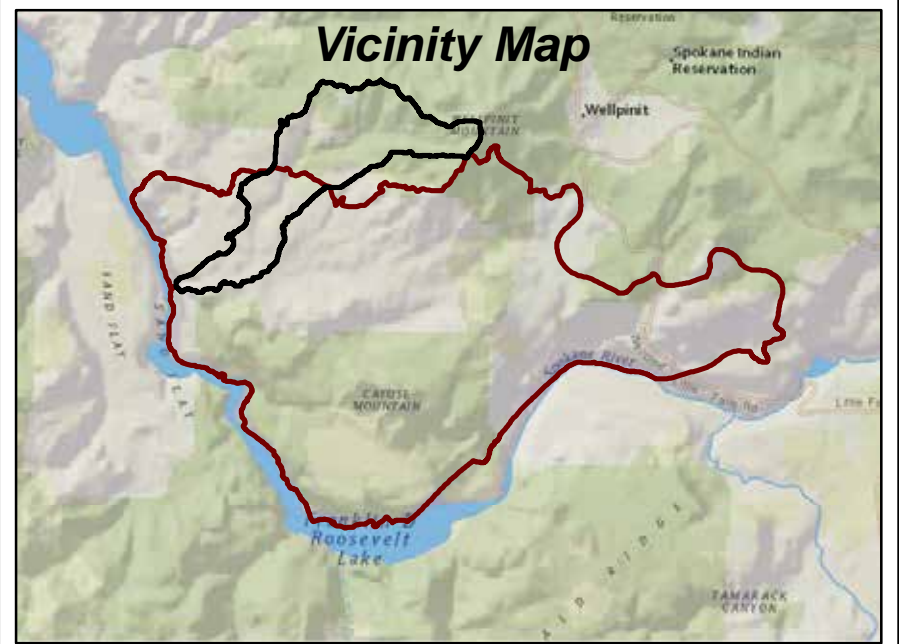
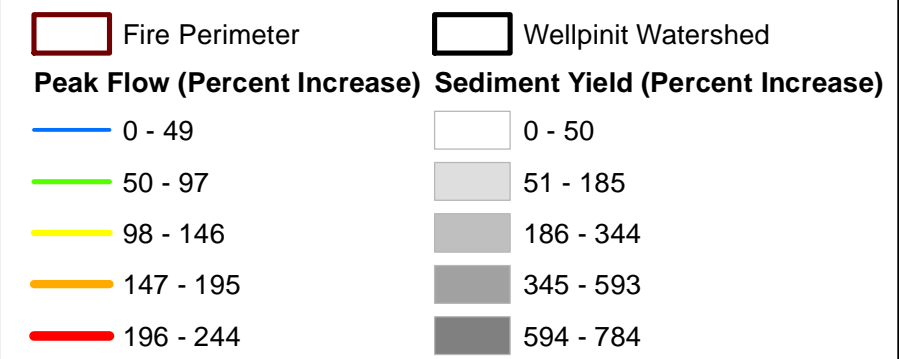
Wellpinit Watershed - 3,782 Acres
10-Year, 1-Hour Storm Event
(0.6" of Rainfall)

106% Increase Peak Flow
 49% Increase Sediment Yield



Cayuse Mountain Fire

Wellpinit Watershed Response



No warranty expressed or implied is made regarding the accuracy or utility of the data and information on this map.



BURNED AREA EMERGENCY RESPONSE PLAN

2016 CAYUSE MOUNTAIN FIRE

APPENDIX V

SUPPORTING DOCUMENTATION



Interagency BAER Team Members left to right: Darryl Martinez, Harding Polk II, Hal Luedtke, Marsha Davis, Juliette Jeanne, Katherine Rowden, Richard Easterbrook, Rich Pyzik. Not pictured: Dan Hall, Trisha Johnson, Luther Arizana, Fred von Bonin.

1. **Delegation of Authority**
2. **Initial Funding Request**
3. **BAER Team Roster**
4. **BAER Job Hazard Analysis**
5. **Boat Job Hazard Analysis**
6. **USFWS IPac Trust Resources Report**
7. **Cost Risk Analysis**
8. **Fire Effects on Select Culturally Significant Plants within the Cayuse Fire Burn Area**




United States Department of the Interior
Bureau of Indian Affairs
Spokane Agency
PO Box 389
Wellpinit WA, 99040

In Reply Refer To:
Superintendent

MEMORANDUM

To: Team Leader, Burned Area Emergency Response (BAER) Team

From: Acting Superintendent, Spokane Agency 

Subject: Cayuse Mountain BAER Team Delegation of Authority

You are hereby delegated authority and responsibility to assess post fire effects and produce a Burned Area Emergency Response (BAER) Plan outlining measures and standards necessary to mitigate fire damage resulting from the Cayuse Mountain Fire. All BAER activities will be conducted within the framework of provisions contained within Part 620: Department of Interior Manual Chapter 3; Bureau of Indian Affairs policy and sound recourse management practices. A National Environmental Policy Act (NEPA) document will be prepared as part of the BAER Plan.


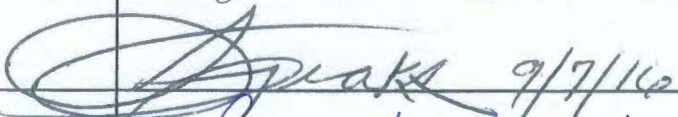
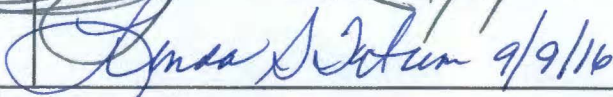
Your primary responsibility is to organize and direct your assigned resources to establish cost effective measures to protect the resources of the Spokane Indian Reservation from further damage and start the process of recovery. You are to work in cooperation with the Spokane Tribe.

As a team leader, you are accountable to me and to the Northwest Regional Director, Stanley Speaks. On any occasion that I am not immediately available, Blaine Kieffer, Spokane Tribal, Fire Management Officer is delegated to represent me.

US DEPT OF INTERIOR
BUREAU OF INDIAN AFFAIRS
BRANCH OF FIRE MANAGEMENT
NATIONAL INTERAGENCY FIRE CENTER

BURNED AREA EMERGENCY RESPONSE (BAER)

**REQUEST TO INITIATE
EMERGENCY STABILIZATION (ES) FUNDING**

1. Date of Request	September 6, 2016
2. Agency Name	Spokane
3. Agency Contact and Phone number	Dale Sebastian
4. Fire Name	Cayuse Mountain
5. Fire Code	KM6J
6. Project duration	One year for ES treatments
7. Request for funds (total dollars) NOTE: list proposed needs (BAER team & treatments & estimated costs on additional page.	Emergency Stabilization \$ 20,000
8. ES funding Code: XXXX is Fire Code	16XA1125TR / AF2202020.7D4100 / Cost Center / AF.SPKM6J0000.00000
9. Total estimated cost of ES Project NOTE: Attached draft E table with proposed treatments and estimated costs, if available.	Emergency Stabilization \$
10. Agency Office Signature: Review and Approved	 9/7/16
11. Regional Office Signature: Reviewed and Approved	 9/7/16
12. BIA - NIFC Office Signature: Reviewed and Approved	 9/9/16

NOTE: ES Plan Approval Levels - Agency Superintendent Office up to \$250,000; Regional Director Office \$250,000 to \$500,000; NIFC BIA Director, Branch of Wildland Fire Management, over \$500,000.



Cayuse Mountain BAER Team

POSITION	NAME/ORGANIZATION ADDRESS	CELL EMAIL
Team Leader BAEL	Darryl Martinez/BIA 1001 Indian School Rd. Albuquerque, NM 87104	(505) 331-3514 darryl.martinez@bia.gov
Deputy Team Leader BAEL	Hal Luedtke/BIA 1001 Indian School Rd. Albuquerque, NM 87104	(505) 228-2403 hal.luedtke@bia.gov
Documentation/ Environmental BADO	Juliette Jeanne/BIA PO Box 560 White River , AZ 85041	(928) 205-9460 juliette.jeanne@bia.gov
Geo. Info Specialist GISS	Luther Arizana/BIA 3833 South Development Avenue, Boise ID 83705	(208) 861-7783 luther.arizana@bia.gov
Geo. Info Specialist GISS	Trisha Johnson/Confederated Tribes of Warm Springs P.O. Box C Warm Springs OR 97761	(541) 279-8084 trisha.johnson@ctwsbnr.org
Geo. Info Specialist GISS	Richard Easterbrook/FWS 1201 Oakridge Drive, Suite 320, Fort Collins, CO 80525	(303) 350-7501 richard_easterbrook@fws.gov
Archeologist/Cultural BACS	Dan Hall/BIA 2800 Cottage Way, Sacramento, CA 95825	(541) 589-1188 dan.hall@bia.gov
Archeologist/Cultural ARCH	Harding Polk II/BIA 1001 Indian School Rd. Albuquerque, NM 87104	(505) 409-8850 harding.polk@bia.gov
Forester/Vegetation BAFO	Fred von Bonin/ BIA 1001 Indian School Rd. Albuquerque, NM 87104	(505) 903-4966 frederick.vonbonin@bia.gov
Geologist BAGE	Marsha Davis/ NPS 909 First Avenue, Seattle, WA 98104	(425) 417-1421 marsha_davis@nps.gov
Hydrologist Trainee BAHY (T)	Katherine Rowden/ NWS 2601 N. Rambo Road, Spokane, WA 99224	(509) 714-4524 katherine.rowden@noaa.gov
Fisheries Biologist/ Hydrologist BAHY	Rich Pyzik/ USFS PO Box 67, Paisley, OR 97636	(541) 219-1871 rpyzik@fs.fed.us

National Interagency Burned Area Emergency Response	1. WORK PROJECT/ACTIVITY BAER Assessments	2. LOCATION 2016 Cayuse Mountain Fire	3. UNIT DOI BAER Team
JOB HAZARD ANALYSIS (JHA)	4. NAME OF ANALYST Hal Luedtke	5. JOB TITLE Team Leader	6. DATE PREPARED 09/1/2016
7. TASKS/PROCEDURES	8. HAZARDS	9. ABATEMENT ACTIONS Engineering Controls * Substitution * Administrative Controls * PPE	
General Field work, monitoring	General personal safety	Bring your radio with charged battery Sign out; If going to a remote area alone let someone know specifically where you will be; Be sure someone knows you have returned.	
	Sun and hyperthermia	Cover areas of exposed skin with proper personal protective clothing.	
		Use sunscreen to prevent sunburn.	
		Drink enough water to keep hydrated and prevent heat exhaustion or heat stroke (at least 2 quarts in summer). Pace yourself when climbing steep, open slopes.	
	Hypothermia and cold	Carry extra clothes; wear layers to prevent sweating and subsequent cooling.	
		Bring rain gear, hat, warm gloves with you everyday.	
		Use extra caution in stream bottoms to prevent falling in water and hypothermia.	
	Giardia / insects	Don't drink unfiltered or untreated water from creeks.	
		Check yourself daily for ticks, especially hair.	
		Tuck pants into boots, shirt into pants, wear long sleeves.	
	Fatigue, carelessness	Get plenty of sleep at night; Be careful and do job right the first time, safely.	
	Trip and fall, eye poking	Watch for down trees and debris on forest floor. Wear goggles when walking in thick, shrubby areas.	
	Crossing creeks	Watch where you walk in stream, expect rocks to be slippery, don't cross if you feel unsafe.	
		Cross facing upstream so knees don't buckle, use a stick for extra balance.	
	AML sites (Abandoned Mine Lands)	Watch for shafts, pits, adits and trenches that present fall hazards, falling timbers, roof collapse, entrapment and possible toxic gases – keep out. Watch for old cases containing explosives – avoid approaching/contact/handling. Tailing and waste rock piles are unstable trip hazards – stay off. Uranium mines and waste rock/tailing piles - be aware of proximity to these sites and stay away from associated mitigation activities unless you have a specific purpose to be there. Airborne dust –	

		some roads may have been surfaced with waste rock from mines – we don't know where – keep windows closed and use recirculating air conditioning on dusty roads.
Field surveys, monitoring	Steep slopes, Remote worksites	Wear vibram soled shoes, with good ankle support. Carry a radio, leave itinerary.
Mapping/Inventory Within Fire Perimeter	Working within fire perimeter.	Wear PPE (Hard Hat, leather boots, NOMEX, fire shelter, goggles, and gloves) at all times. Recognize fires are not controlled. Know your 10 standard fire orders and "watch out" situations.
	Stump/root holes	Keep your eyes on path of travel. Stop your travel and complete task if your attention is diverted.
	Snags/Hazard trees	Size up your surroundings. Avoid work in areas where hazards exist. Be aware of expected conditions. Post a lookouts if the wind picks up.
	Slippery footings	Be aware in areas of wet ash, loose rocks, and unstable slopes.
	Dangerous wildlife	Be aware at all times.
	Personal Health and Safety	Take care of cuts, bruises, and blisters immediately. Report accident to Team Leader and complete accident report.
	Lightning	Check weather report, stay off ridge tops and open slopes during lightning storms If stuck in open keep radio and metallic objects away from you, squat down with only feet on ground using insulate pad if possible, keep as much of your body off the ground as possible.
	Falling rocks	Wear hardhat if in area with loose rocks; don't work directly above another person; be wary of rocks.
	Heavy brush	Wear long sleeve shirt; goggles
	Insect bites	Wear long sleeve shirt and hat; use repellent at your discretion. Carry anti-histamine and asthma-inhaler for bee stings. If known allergic carry proper medication and instruct coworkers in administration.
Communication/Coordination with Team Leaders and Suppression Personnel	General Personal Safety	Report your next day's work area to Team Leader by 1900 the previous day in order to be included in next day's shift plan.
		Be sure to check in with Division Sup.Group before entering and leaving fire perimeter.
Driving	Vehicle accidents and associated injury	Always wear safety belts and make sure everyone is buckled up! Drive carefully on heavily travelled roadways. Driving defensively means anticipating the other drivers actions before it happens. Back your vehicle in when parking and use a ground guide when available.
		Drive carefully in snow and mud, chain up BEFORE you get stuck. Don't attempt accessing remote areas in poor conditions
		Roads are narrow, drive defensively, giving yourself enough time/space to react to other drivers. Maintain stopping distance of half the distance you can see. Drive with headlights on.


Stop and take a break if you feel sleepy while driving, or let someone else drive.

If possible, remove hazards from roadbed rather than try to drive over or around them.

10. SIGNATURE

11. TITLE

12. DATE

	BAFO	9/2/16
Joe Hill	BACS	9/2/16
Hardy Polk	ARCH	9/2/16
Rich Pyle	BIAM	9/2/16
Manke Davis	BAGE	9/2/16
Flower	BAHY	9/2/16
Harl Inman	BAES	9/2/16
Trisha JOHNSON	GISS	9/2/16
Rich Lutz	GISS	9/2/16
Arthur Fuzana	GISS	9/2/16
Gabriel Jean	BADO	9/2/16

U.S. Department of Interior BAER Team	1. WORK PROJECT/ACTIVITY Boat Use (Rx Fire & Wildfires)	2. LOCATION Spokane Reservation, WA	3. UNIT WA-SPA
JOB HAZARD ANALYSIS (JHA) References-FSH 6709.11 and -12 (Instructions on Reverse)	4. NAME OF ANALYST Harold Luedtke	5. JOB TITLE BAEL	6. DATE PREPARED 9/5/2016
7. TASKS/PROCEDURES	8. HAZARDS	9. ABATEMENT ACTIONS Engineering Controls * Substitution * Administrative Controls * PPE	
Hauling to a location	Injury to employee or public during travel, Damage to equipment,	Use a hauling vehicle of adequately rated capacity and capability. Perform a pre-trip inspection on the trailer. Make sure it is road worthy, if not, DO NOT USE! Make sure all lights are working and you have the correct size trailer hitch ball and it is correctly and securely attached to the vehicle. The driver must be proficient in driving with a trailer on a roadway and backing of a trailer. Make sure all items are secure and will not fall off or blow out of the trailer during travel. When hauling a motor boat make sure the motor is secure.	
PPE	Injury, Illness, Exposure, Drowning	<p>Personnel Flotation Device is "required" to be worn at all times while in a watercraft on the water. It should be of proper size and US Coast Guard Approved.</p> <p>Communication equipment of some type, either a FS radio, Cell phone, SAT phone or Marine radio must be on the water craft while in use.</p> <p>Warm clothing and rain gear is a good idea to carry along to help prevent hypothermia while on the water.</p> <p>If involved in Rx burns or wildfires an Approved Hard Hat must be wore as soon as you exit the watercraft.</p> <p>Use non skid boots while traveling in the watercraft to prevent slips and falls.</p> <p>Make sure all fire tools are properly protected while on board the watercraft and are clear of passengers and the fuel supply.</p> <p>Balance of equipment and on the watercraft is extremely important to ensure a safe water experience.</p>	
Loading and Unloading and Fueling the Boat	Injury, Fire from fueling	<p>Use non-skid surface, if available, while loading and unloading watercraft. Enter slowly and keep a good low center of gravity while entering the watercraft.</p> <p>Enter watercraft on operators command.</p> <p>No smoking is allowed while in watercraft if gas or any type of fuel in on board. No smoking while refueling the watercraft.</p>	
Underway	Capsizing, Person overboard, Rough water, Collision, Fire	<p>Be observant of other boat traffic and rocks while on the water. If needed, have a map of the lake or destination of trip on board.</p> <p>All personnel must wear approved PFD while underway on the water at all times.</p> <p>Use proper speed for the conditions, make sure all cargo is secured in a fashion that it will not blow out of the watercraft.</p> <p>Have look outs posted for rocks if needed, carry extra safety</p>	

		Use proper speed for the conditions, make sure all cargo is secured in a fashion that it will not blow out of the watercraft. Have look outs posted for rocks if needed, carry extra safety equipment such as: Radio, Tools, Kicker Motor, Oars, Paddles, Extra Fuel and Extra food and Clothing.
Tieing up to shore, Dock Use	Damage to Boat or Motor, Lost Boat	Keep lines and anchors properly stowed. Inspect prior to use and make sure they are properly attached to the watercraft. Make sure the the watercraft is securely anchored to shore and pulled up in a fashion that the watercraft will not sustain damage from waves, wind or adverse weather. If docked on a dock make sure the watercraft in secured on the bow and stern of the watercraft. Raise motor to prevent damage to the prop while anchored to the shore.
Maintenance	Condition of equipment	Boat motors must be maintained yearly. The lower unit grease should be changed each year. Prop should be inspected for cracks. If damage apeared the prop should be replaced prior to use. Four Stroke motors should have the oil and oild filter changed. Gas should be drained from the gas line for winter storage. Spark plugs and gas filter should be replaced yearly if needed. Make sure the drainplug is in the watercraft and properly attached prior to putting to watercraft in the water. Do a visual inspection of the watercraft prior to use.
Transportation of Fuel in Watercraft	Fuel spills, Fire	No Smoking while fuel of any kind is in the watercraft. All fuel "must" be transported in a approved and proper container. (See Health and Safety Code book and OSHA regulations) for more details. This includes: Chainsaws, Drip Torch Fuel, Portable Pump Gas, etc. Make sure all containers are transported in an upright position and are secure for travel in the watercraft. Keep fuel away from personnel clothing and fire line gear to prevent contact.
Emergency Procedures	Illness or Injury	Notify Dispatch of an emergency via radio or cell phone or SAT phone. Treat the Injury as qualified to do so. Be prepared to give the following Patient Assessment information to dispatch: Location in which injured party is: (Lake name, etc.) Type of Injury Severity of Injury Plan of extraction Closest boat landing or portage The Incident Response Pocket Guide (Pink Pages) has more Health and Safety information that could be useful.

		Notify your Supervisor as soon as possible about the Incident and fill out the proper paper work.	
Hal J... 22 L R	BAEL		
Trisha Johnson	BAFO		
Rich...	GISS		
Rich...	GISS		
Rich...	GISS		
Rich...	BACS		
Rich...	ARCH		
Rich...	BATH		
Rich...	BATH		
Julie...	BATH		
10. LINE OFFICER SIGNATURE		11. TITLE	12. DATE

Previous edition is obsolete

(over)

Cayuse Fire BAER

IPaC Trust Resources Report

Generated September 01, 2016 04:56 PM MDT, IPaC v3.0.8

This report is for informational purposes only and should not be used for planning or analyzing project level impacts. For project reviews that require U.S. Fish & Wildlife Service review or concurrence, please return to the IPaC website and request an official species list from the Regulatory Documents page.

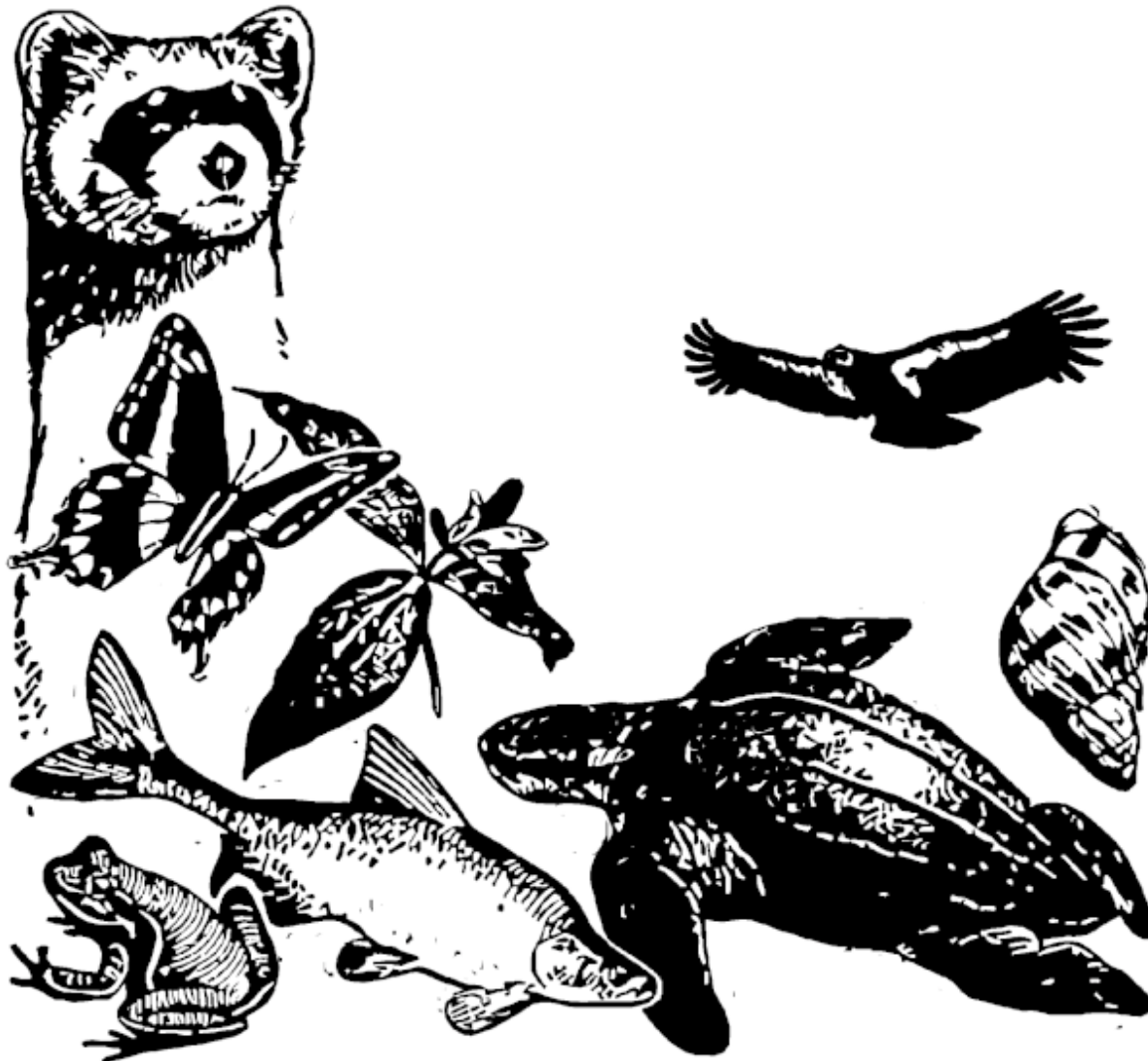


Table of Contents

- IPaC Trust Resources Report [1](#)
- Project Description [1](#)
- Endangered Species [2](#)
- Migratory Birds [4](#)
- Refuges & Hatcheries [6](#)
- Wetlands [7](#)

U.S. Fish & Wildlife Service

IPaC Trust Resources Report



NAME

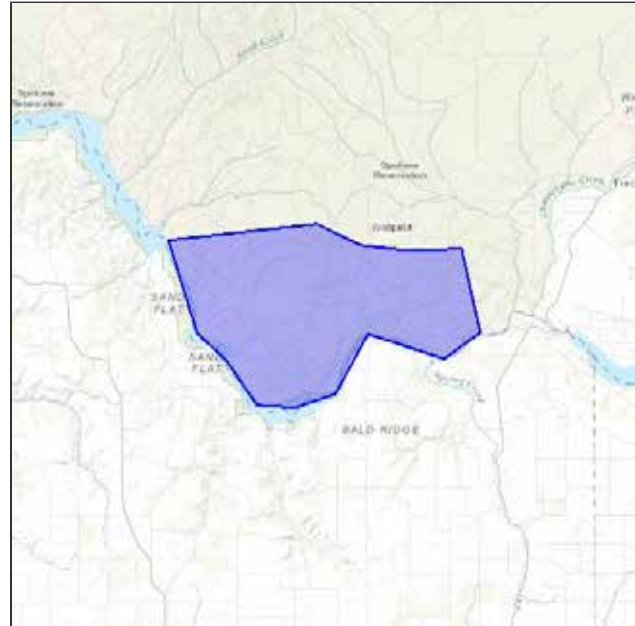
Cayuse Fire BAER

LOCATION

Lincoln and Stevens counties,
Washington

IPAC LINK

<https://ecos.fws.gov/ipac/project/5IBZH-T2CV5-ANHFU-425YZ-YTUPE4>



U.S. Fish & Wildlife Service Contact Information

Trust resources in this location are managed by:

Washington Fish And Wildlife Office

510 Desmond Drive Se, Suite 102

Lacey, WA 98503-1263

(360) 753-9440

Endangered Species

Proposed, candidate, threatened, and endangered species are managed by the [Endangered Species Program](#) of the U.S. Fish & Wildlife Service.

This USFWS trust resource report is for informational purposes only and should not be used for planning or analyzing project level impacts.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list from the Regulatory Documents section.

[Section 7](#) of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency.

A letter from the local office and a species list which fulfills this requirement can only be obtained by requesting an official species list either from the Regulatory Documents section in IPaC or from the local field office directly.

The list of species below are those that may occur or could potentially be affected by activities in this location:

Birds

Yellow-billed Cuckoo *Coccyzus americanus* Threatened

CRITICAL HABITAT

There is **proposed** critical habitat designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=B06R

Fishes

Bull Trout *Salvelinus confluentus* Threatened

CRITICAL HABITAT

There is **final** critical habitat designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=E065

Mammals

Grizzly Bear *Ursus arctos horribilis* Threatened

CRITICAL HABITAT

No critical habitat has been designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=A001

North American Wolverine *Gulo gulo luscus* Proposed Threatened

CRITICAL HABITAT

No critical habitat has been designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=A0FA

Washington Ground Squirrel *Uroditellus washingtoni* Candidate

CRITICAL HABITAT

No critical habitat has been designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=A0HE

Critical Habitats

There are no critical habitats in this location

Migratory Birds

Birds are protected by the [Migratory Bird Treaty Act](#) and the [Bald and Golden Eagle Protection Act](#).

Any activity that results in the take of migratory birds or eagles is prohibited unless authorized by the U.S. Fish & Wildlife Service.^[1] There are no provisions for allowing the take of migratory birds that are unintentionally killed or injured.

Any person or organization who plans or conducts activities that may result in the take of migratory birds is responsible for complying with the appropriate regulations and implementing appropriate conservation measures.

1. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

Additional information can be found using the following links:

- Birds of Conservation Concern
<http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php>
- Conservation measures for birds
<http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php>
- Year-round bird occurrence data
<http://www.birdscanada.org/birdmon/default/datasummaries.jsp>

The following species of migratory birds could potentially be affected by activities in this location:

Bald Eagle <i>Haliaeetus leucocephalus</i>	Bird of conservation concern
Season: Year-round http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=B008	
Brewer's Sparrow <i>Spizella breweri</i>	Bird of conservation concern
Season: Breeding http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=B0HA	
Calliope Hummingbird <i>Stellula calliope</i>	Bird of conservation concern
Season: Breeding http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=B0K3	
Eared Grebe <i>Podiceps nigricollis</i>	Bird of conservation concern
Season: Breeding	

Ferruginous Hawk <i>Buteo regalis</i> Season: Breeding http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=B06X	Bird of conservation concern
Flammulated Owl <i>Otus flammeolus</i> Season: Breeding http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=B0DK	Bird of conservation concern
Fox Sparrow <i>Passerella iliaca</i> Season: Breeding	Bird of conservation concern
Lewis's Woodpecker <i>Melanerpes lewis</i> Season: Breeding http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=B0HQ	Bird of conservation concern
Loggerhead Shrike <i>Lanius ludovicianus</i> Season: Breeding http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=B0FY	Bird of conservation concern
Long-billed Curlew <i>Numenius americanus</i> Season: Breeding http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=B06S	Bird of conservation concern
Peregrine Falcon <i>Falco peregrinus</i> Season: Breeding http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=B0FU	Bird of conservation concern
Rufous Hummingbird <i>selasphorus rufus</i> Season: Breeding http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=B0E1	Bird of conservation concern
Short-eared Owl <i>Asio flammeus</i> Season: Year-round http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=B0HD	Bird of conservation concern
Swainson's Hawk <i>Buteo swainsoni</i> Season: Breeding http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=B070	Bird of conservation concern
Western Grebe <i>aechmophorus occidentalis</i> Season: Breeding http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=B0EA	Bird of conservation concern
White Headed Woodpecker <i>Picoides albolarvatus</i> Season: Year-round http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=B0HU	Bird of conservation concern
Willow Flycatcher <i>Empidonax traillii</i> Season: Breeding http://ecos.fws.gov/tess_public/profile/speciesProfile.action?sPCODE=B0F6	Bird of conservation concern

Wildlife refuges and fish hatcheries

There are no refuges or fish hatcheries in this location

Wetlands in the National Wetlands Inventory

Impacts to [NWI wetlands](#) and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

DATA LIMITATIONS

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

DATA EXCLUSIONS

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tubercid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

DATA PRECAUTIONS

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

This location overlaps all or part of the following wetlands:

Freshwater Emergent Wetland

[PEM1A](#)

[PEM1Ad](#)

[PEM1C](#)

[PEM1F](#)

Freshwater Forested/shrub Wetland

[PFO1A](#)

[PFO1C](#)

[PSS1A](#)

[PSS1C](#)

Freshwater Pond

[PAB3H](#)

[PAB4H](#)

[PUBH](#)

[PUBHh](#)

[PUBHx](#)

Lake

[L1UBHh](#)

[L1UBHx](#)

[L2USC_x](#)

Riverine

[R4SBC](#)

[R5UBH](#)

A full description for each wetland code can be found at the National Wetlands Inventory website: <http://107.20.228.18/decoders/wetlands.aspx>

2016 Cayuse Mtn. Fire

ISSUE #	Issues/ Concerns	Potential Adverse Impact	Specific Issue and/or Location	BIA	Tribe	Fund		RESULT	UNTREATED-RISK			NOTES	TREATED RISK	COSTS
						ES	BAR		Likelihood	Consequence	Risk			
								SPEC NAME				Footnote #		
	FLOODING		Washout along Bull Pasture				X	**Pre Fire Condition - Not Addressed**				**Pre Fire Condition - Not Addressed**	N/A	
			Road along river				X	Storm Patrol; Hazard Warning Signs	Possible	Moderate	Medium		Low	
			Areas with Culverts				X	Storm Patrol; Hazard Warning Signs	Possible	Major	High		Medium	
			Areas with No culverts				X	Storm Patrol; Hazard Warning Signs	Possible	Major	High		Medium	
			Areas with No culverts				X	Floatable Debris Removal	Possible	Moderate	Medium		Low	
	INFRASTRUCTURE		Marion Wynecoop house				X	Non-spec Management Recommendation	Possible	Catastrophic	Extreme		Medium	
			Assess shoreline for life and property issues				X	Structure Protection	Possible	Major	High		Medium	
			Windmill					Non-spec Management Recommendation	Possible	Moderate	Medium		Low	
	CULTURAL RESOURCES		Reforestation Survey				X	Planning	Possible	Moderate	Medium		Low	
			Cemetery				X	Heritage Site Protection	Likely	Major	High		Medium	
			Coyote Rocks						Unlikely	Insignificant	Low		Low	
			Storage pits						Unlikely	Insignificant	Low		Low	
			Culturally used plants						Unlikely	Minor	Low		Low	
	WILDLIFE		Winter Range Habitat					Non-spec Management Recommendation	Possible	Moderate	Medium			
			50 Wild horses									10 horses burned		
			T&E Species					No effect	Rare	Minor	Low			
			Eagle nests					No effect	Unlikely	Minor	Low			
	HAZARDOUS MATERIALS		Sherwood reclaimed uranium mine									Burned small portion, no concern		
	FENCES		Wildlife mitigation fencing				X	Replaced with mitigation funding						
10	FORESTRY		Reforestation					X	Reforestation and Stocking Surveys					
			92 CFI plots					X	CFI Plot Reestablishment	Possible	Minor	Medium		
			Salvage				X					Not covered under BAER policy		
			600 acre range unit									Range unit closed by Tribe		
			Forest Reserves									Not reforested because not commercial timber resource		
			Tree Hazards				X	Tree Hazard Assessment/ Tree Hazard Mitigation	Possible	Major	High		Low	\$5,580
11	PUBLIC SAFETY		Rd signage replacement						Sign Replacement	Likely	Major	High		Low
			Guard rail replacement						Guard Rail Replacement	Likely	Major	High		Low
			Down electrical lines									Non-functioning lines not an issue; functioning lines replaced by electrical company		
			Exposure to abandoned mines									Not a concern		
	FISHERIES		Water quality degradation						Possible	Minor	Low		Low	
			Fisheries in Spokane River						Possible	Minor	Low		Low	
			Benjamin Lake-fisheries						Unlikely	Insignificant	Low		Low	
			Mathews Lake-cattail lake						Unlikely	Insignificant	Low		Low	
12	LANDS UNLIKELY TO RECOVER NATURALLY	Spread of invasive plants and noxious weeds	Invasive plants and noxious weeds				X	Invasive Species Control	Likely	Major	High		Medium	
							X	Invasive Species Monitoring	Likely	Major	High		Medium	

FIRE EFFECTS ON SELECT CULTURALLY SIGNIFICANT PLANTS WITHIN THE CAYUSE FIRE BURN AREA

Source: USDA Forest Service Fire Effects Information System (FEIS)

Bitterroot, LEWRED, (*Lewisia rediviva*)

GENERAL BOTANICAL CHARACTERISTICS:

Bitterroot is a native, cool-season, low-growing, ephemeral, perennial forb. Most of the biomass consists of a thick, often branching taproot up to 12.8 inches (32 cm) long. Bitterroot has a short caudex with densely clustered succulent leaves at the caudex crown. The fruit is a capsule with small, round seeds.

IMMEDIATE FIRE EFFECT ON PLANT:

Fire information is lacking for this species. Fire during periods of active growth presumably top-kills bitterroot. Fires occurring during plant dormancy probably do not harm this geophyte.

PLANT RESPONSE TO FIRE:

Cool-season forbs such as bitterroot are susceptible to fall fire occurring in the period of active growth. Fall burning probably adversely affects the rate of spring growth. It may also curtail flowering by consuming floral buds. Carbohydrate reserves in the root are probably adequate, however, for bitterroot to survive occasional fall fire and still resume growth in spring.

FIRE MANAGEMENT CONSIDERATIONS:

Summer or early fall burning, before fall growth has been initiated, would probably favor bitterroot by maintaining or regressing its plant community to early seres of plant succession.

Camas, CAMQUA, (*Camassia quamash*)

GENERAL BOTANICAL CHARACTERISTICS

Common camas is a native perennial forb. Its peduncle is from 8 to 20 inches (20-50 cm) in height and supports a terminal raceme. The peduncle and basal leaves attach to a bulb that is up to 1.5 inches (6 cm) across. Its roots are fibrous. The fruit is a three-celled capsule with 5 to 10 seeds per cell.

IMMEDIATE FIRE EFFECT ON PLANT:

Fire presumably top-kills common camas.

PLANT RESPONSE TO FIRE

Common camas on the Palouse prairie of eastern Washington increases with frequent fire. Data regarding common camas post-fire recovery are lacking.

FIRE MANAGEMENT CONSIDERATIONS:

Because growth and flowering occur in spring and early summer, short-interval fires in spring or early summer would probably reduce common camas populations.

Northwest Coast Indians reportedly set fires annually. This optimized common camas production by maintaining an open prairie.

Chokecherry, PRUVIR, (*Prunus virginiana*)

GENERAL BOTANICAL CHARACTERISTICS:

Chokecherry is a native, deciduous, thicket-forming erect shrub or small tree. Stems are numerous and slender, either branching from the base or with main branches upright and spreading. Heights vary considerably according to variety and site quality, ranging from 3 to 19.5 feet (1-6 m). In the Great Basin, chokecherry may grow to almost 40 feet (12 m) with trunk diameters of approximately 8 inches (20 cm). Perfect flowers are borne on leafy twigs of the season. Fruits are drupes, each containing a small stone. Chokecherries have a network of rhizomes and a deep root system established at intervals along the rhizomes. Roots may extend laterally more than 35 feet (10.6 m) and vertically more than 6 feet (1.8 m). Rhizomes range from 0.4 to 0.8 inch (1-2 cm) in diameter.

IMMEDIATE FIRE EFFECT ON PLANT:

Fire often kills aboveground chokecherry stems and foliage, but it quickly sprouts, either the same year following a spring burn, or by the next growing season.

PLANT RESPONSE TO FIRE:

Most studies report either an increase in chokecherry in the years following fire, or an increase followed by a return to pre-fire numbers.

FIRE MANAGEMENT CONSIDERATIONS:

Chokecherry is a component of persistent, fire-maintained seral shrubfields on steep slopes in Northern Idaho. Fuels in shrubfields differ in quantity and distribution from those on forested sites. Herbaceous and large woody fuels are relatively light. Live and dead shrub biomass, which includes chokecherry, can reach nearly 20 tons per acre. After fires, which are severe during summer drought conditions, dense shrub cover regenerates within 10 years.

Foamberry, SHECAN, (*Shepherdia canadensis*)

GENERAL BOTANICAL CHARACTERISTICS:

Foamberry, also known as Russet buffaloberry, is a native, deciduous, nitrogen-fixing shrub ranging in height from 3 to 13 feet (0.9-3.9 m). Plants are generally dioecious but occasionally monoecious. Fruits are drupelike, ovoid achenes enveloped in a fleshy perianth which turns yellowish red to bright red when ripe. Roots have been variously reported as rhizomatous with relatively deep underground parts, fibrous and shallow and a taproot with no rhizomes.

IMMEDIATE FIRE EFFECT ON PLANT:

Severe fires will consume all aboveground leaves and stems of russet buffaloberry, while light to moderate fires will leave some stems standing.

PLANT RESPONSE TO FIRE:

Russet buffaloberry is normally fire resistant but can be eliminated by fire. As a result it is classified as moderately resistant to burning.

FIRE MANAGEMENT CONSIDERATIONS:

Low- to moderate-intensity fires may increase vigor and density of russet buffaloberry in old-growth stands. Berry production may also be increased for several years after fire.

Serviceberry, AMEALN, (*Amelanchier alnifolia*)

GENERAL BOTANICAL CHARACTERISTICS

Saskatoon serviceberry is a native, deciduous shrub or small tree reaching 3 to 26 feet (1-8 m) at maturity. Grown alone, the crown is rounded with spreading to erect branches. Growth form is highly variable, however; Saskatoon serviceberry often forms thickets, mats, or grows in clumps. The flowers and fruits are borne in terminal clusters; the fruits are berrylike pomes. Each fruit contains 4 to 10 small seeds, some of which are usually infertile. The seedcoat is leathery in texture. Saskatoon serviceberry is relatively short-lived.

IMMEDIATE FIRE EFFECT ON PLANT:

Saskatoon serviceberry is top-killed by moderate to severe fire. Larger branches may survive light-severity fire.

PLANT RESPONSE TO FIRE:

Saskatoon serviceberry sprouts after top-kill by fire. Saskatoon serviceberry sprouts mostly from upper portions of the root crown. When the root crown is killed by fire, Saskatoon serviceberry sprouts from rhizomes further beneath the soil surface. Saskatoon serviceberry cover usually increases or is unaffected by fire.

FIRE MANAGEMENT CONSIDERATIONS:

Saskatoon serviceberry is most vigorous in seral plant communities, and prescribed fire can be used to maintain and/or promote seral communities.

