INTERAGENCY
BURNED AREA EMERGENCY RESPONSE PLAN

WATERFALLS 2 FIRE

AGENCY/UNIT: **WARM SPRINGS AGENCY, BUREAU OF INDIAN AFFAIRS, THE CONFEDERATED TRIBES OF THE WARM SPRINGS RESERVATION**

LOCATION: **WARM SPRINGS, OREGON**

DATE: **SEPTEMBER 7, 2012**

PREPARED BY: **WARM SPRINGS BURNED AREA EMERGENCY RESPONSE TEAM**

WATERFALLS 2 FIRE
WARM SPRINGS CONFEDERATED TRIBES
BURNED AREA EMERGENCY RESPONSE TEAM

AGENCY/UNIT: Bureau of Indian Affairs- Warm Springs Reservation of Oregon
LOCATION: Jefferson County, Oregon
DATE: September 7, 2012
PREPARED BY: Warm Springs Agency
AGENCY: Bureau of Indian Affairs

Submitted by: _____ Date: _____
Vernon Wolf, Warm Springs BAER Team Leader

BURNED AREA EMERGENCY RESPONSE PLAN

2012 WATERFALLS 2 FIRE

REVIEW AND APPROVAL -- BUREAU OF INDIAN AFFAIRS

I. EMERGENCY RESPONSE PLAN CONCURRANCE

□ **Approve**

□ **Approve with Revision**

□ **Disapproved**

Explanation for Revision or Disapproval:

Superintendent, Warm Springs Agency, BIA **Date**

II. EMERGENCY RESPONSE PLAN CONCURRANCE

□ **Concur**

□ **Concur with Revision**

□ **Disapproved**

Explanation for Revision or Disapproval:

Regional Director, Northwest Region, BIA **Date**

III. EMERGENCY RESPONSE PLAN APPROVAL

□ **Approve**

□ **Approve with Revision**

□ **Disapproved**

Explanation for Revision or Disapproval:

Lyle Carlile, Director, Branch of Wildland Fire Management, BIA NIFC **Date**

EXECUTIVE SUMMARY

This plan has been prepared in accordance with the Department of Interior, Burned Area Emergency Rehabilitation Handbook (2006). This plan provides emergency rehabilitation recommendations for all lands burned within the Warm Springs Reservation of Oregon during the Waterfalls 2 Fire. The primary objectives of this **B**urned **A**rea **E**mergency **R**ehabilitation [BAER] Plan Area are:

- *To prescribe post-fire mitigation measures necessary to protect human life, property and critical and cultural resources.*
- *To rehabilitate the integrity of affected lands in accordance with Tribal Integrated Resource Management Plan for the Forested Area of the Confederated Tribes of the Warm Springs Reservation of Oregon, and all applicable and relevant federal, state and local laws, policies and regulations.*
- *To mitigate site conditions following the fire to protect the Threatened and Endangered (T & E) species that have been affected by this fire.*

The Waterfalls 2 Fire started on August 6, 2012 as a result of one day of intense lightning activity across the entire reservation. Through September 5, 2012 the High Cascades Complex Fire has burned 12,257 acres of reservation lands.

The fire is located approximately five miles northeast of Mt. Jefferson and 22 west of Warm Springs, Oregon in parts of Section 36 Township 9 South, Range 8 East; parts of Sections 24, 25, 26, 35, and 36 Township 9 South, Range 8.5 East; parts of Sections 18, 19, 20, 21, 27, 28, 29, 30, 31, 32, 33, and 34 Township 9 South, Range 9 East, parts of Section 1 Township 10 South, Range 8 East; parts of Sections 1, 2, 11, 12, 13, and 14 Township 10 South, Range 8.5 East; parts of Sections 3, 4, 5, 6, 7, 8 and 18 Township 10 South, Range 9 East: Willamette Meridian, Jefferson County, Oregon. The fire location is in high elevation forest where both terrain and poor access made firefighting efforts a challenge. The fire is generally only accessible by road in the commercial portions of the forest. The elevation ranges from approximately 3,600-6,600 feet. The terrain is moderate to steeply sloped forestland comprised of Douglas-fir-ponderosa pine forest type to western hemlock–true fir forest types. Two major drainages, Whitewater River and Shitike Creek, fall within the fire boundary.

At the height of suppression efforts there was a Type II teams with total fire personnel reaching 980. The total suppression cost to date as of September 7 is $13.1 million.

A Burned Area Emergency Rehabilitation (BAER) Team was activated by the Superintendent and Tribal Natural Resource Manager on August 22, 2012. Individual team members were to be provided by the local Tribe/Agency staff along with 1 team member from the BIA and one Forest Service sponsored member. Members of the Bureau of Indian Affairs Northwest Region and National Interagency staff reviewed many of the field treatment areas during the incident, providing valuable recommendations to the local staff. Damage assessment began on the incident on August 26, 2012, following meetings with the Agency Superintendent and Tribal Natural Resource Leaders. The BAER Team was requested to prepare a BAER plan to address potential effects of the fire and fire suppression impacts to reservation lands impacted by the

Waterfalls 2 Fire. The BAER Team evaluated post fire conditions, emergency stabilization needs, suppression impacts and long-term rehabilitation actions. A plan was completed by the team to present to the agency.

This plan has been developed to address the stabilization requirements established by federal law, policies and all applicable and relevant Department of Interior and Bureau of Indian Affairs resource management mandates. The following issues were identified within the Waterfalls 2 Fire:

- ***Impacts to timber resources, potential salvage and reforestation of commercial forest lands***
- ***Watershed stability***
- ***Sedimentation and loss of soil productivity***
- ***Potential impacts to Threatened and Endangered Species***
- ***Impacts from fire suppression activities***
- ***Fire and fire suppression impacts to archaeological and cultural resources***

The Waterfalls 2 Fire burned 12,257 acres on the Warm Springs Reservation of Oregon as of September 5, 2012. Fire suppression damages include 20 miles of hand line, and 18 miles of dozer line. Burn severity mapped by the BAER Team is: 3,873 acres of very low/unburned severity, 3,385 acres of low severity, 3,042 acres of moderate severity and 1,957 acres high severity. Burn severity acres were mapped the USGS using the Burned Area Reflectance Classification (BARC) satellite imagery, which was validated by team members during field reconnaissance. Noisy Creek drainage and the upper reaches of Shitike Creek drainage both have high percentages of high severity areas that are addressed in resource assessments. Burn severity maps were developed by the team using satellite imagery, aerial observation, and ground reconnaissance Release of sediment from high to moderate severity could have a detrimental effect on resources in the lower portions of watersheds impacted by the fire. Resources at risk include water quality, loss of soil productivity, fisheries, cultural plants, roads and culverts.

The BAER Team conducted intensive field surveys during the fire to identify impacts and compile the following recommendations for treatments of affected lands:

- ***Restore natural conditions to approximately 20 miles of hand line***
- ***Restore natural conditions to approximately 18 miles of dozer line***
- ***Protect structures at Peter's Pasture***
- ***Protect Noisy Creek bridge***
- ***Notify community of safety hazards in fire area***
- ***Provide safe access to traditional use trails***
- ***Reforestation of approximately 876 acres***
- ***Re-establish 45 Continuous Forest Inventory Plots***
- ***Monitor for noxious weeds***
- ***Re-grade impacted roads***
- ***Close roads that were opened for suppression***
- ***Rehabilitate 18 drop points***
- ***Rehabilitate ICP***
- ***Archaeological resource compliance***

Specifications contained within this plan will be implemented through the use of suppression forces attached to the fire, contracted services, and through the use of local resources. The use of suppression forces for conducting some Emergency Fire Rehabilitation type work was authorized and will be completed prior to crew demobilization.

Fire History

In the afternoon of August 6, 2012, a lightning storm ignited several fires across the reservation. The Waterfalls 2 Fire was detected on August 9, 2012 when initial attack actions began on the fire. The fire began in the high elevation forested headwaters of Shitike Creek. The fire burned mostly in conditional use forestlands which are unmanaged and contain higher fuel loadings in general than the commercial forestlands. Hot, dry and windy conditions in steep, remote terrain made the fire difficult to contain. On August 14, 2012 the fire made a run of approximately 2,000 acres. Initial attack resources were stretched beyond their capacity. A Type II Incident Management Team was ordered that same day.

The Oregon Type II Interagency Incident Management Team 1 led by Incident Commander Ross Williams was briefed at the Warm Springs agency office at 2000 hours on August 14, 2012 and was delegated the responsibility of managing the Waterfalls 2 Fire as of 0600 hours on August 15, 2012. Due to the poor access the team began indirect line construction to help protect the commercial forest.

Over the next few days the fire continued to rapidly increase being pushed by gusty winds, high temperatures, and dry fuel conditions. On August 19, 2012 the fire grew by over 2,400 acres across containment lines in the northwest portion of the fire near Sarah Lake. Area closures and structure protection were put in place. Burnout operations were used to the west of Peter's Pasture to protect this culturally significant area and stop overall fire spread. By August 24 the winds began to slow making direct suppression more manageable. Another large scale burnout operation took place on August 25 in the southwest portion of the fire.

Significant progress towards fire containment was achieved between August 26 and August 28 on nearly all portions of the fire. Over this time period a containment perimeter was completed, burned out, and heavy mop-up standards were met. At this date the fire has had no significant change in perimeters. On September 3, the Waterfalls 2 Fire was turned over to the WSA Type III team led by Incident Commander Jabbar Davis. The estimated date of containment for the Waterfalls 2 Fire is September 15, 2012.

Summary of Resource Assessments

Watershed/Soil

Within the Waterfalls 2 Fire perimeter, approximately 16 percent of the acreage experienced high burn severity while most of the remaining areas were nearly evenly distributed in classification as moderately burned, low burned, or unburned. The watershed of concern in the Waterfalls 2 Fire is the Shitike Creek watershed are due to the percentages of the watersheds burned, the change from pre-fire pristine condition of the watershed, and downstream impacts. The following table displays soil burn severity for the Waterfalls 2 Fire.

Soil Burn Severity Class	Acres	Percent of Fire
1 - Unburned	3,501	29%
2 - Low	3,385	27%
3 - Moderate	3,414	28%
4 - High	1,957	16%
Total acres	**12,257**	**100%**

The likelihood of generating overland flow and stream flow in Shitike has increased. Peak flow increases from the fire may also be augmented by sediment and debris bulking within the active channel areas. Increased runoff, erosion, sediment and debris delivery is possible within Upper Shitike Watershed with higher degree of hillslope steepness and high severity burned areas. Areas identified through models as at-risk for flooding from a 25-year precipitation event are Peter's Pasture.

The following ES treatments are specified:

- Protect the metal barn structure at Peters Pasture by placing log barrier/flow deflector to minimize the effects of flooding and debris during high flow events.
- Enhance structural stability of Noisy Creek Bridge with bank armoring, road rocking and construction of an overflow dip to increase flow capacity.
- Patrol stream crossings and roads immediately following storm events to identify areas needing debris removal or that have sustained damage from post-fire watershed effects.
- Remove hazardous woody material and brush in Noisy and Shitike Creeks immediately and following high flow events that to decrease risk and reduce potential damage to the bridges from future high flow events.

Vegetation

The fire produced varying levels of tree mortality ranging from low to high, and while it's anticipated that vegetation with low to moderate intensity will recover within a few years, locations with high tree mortality/severity could take up to seven years for understory vegetation recovery. The fire occurred in conditional use lands with steep rugged topography and relatively intact native plant associations. Cultural plants include huckleberry and beargrass, both of which respond well to a range of fire intensities. Invasive weed recruitment from fire fighting activities will be monitored over the next 3 years to ensure ecological site integrity.

Forest

Impact to forest resources was assessed for The Waterfalls 2 fire. Forest mortality was examined and mapped within the entire fire perimeter with the following results: 4,459 acres (36%) experienced high mortality, 4,163 acres (34%) were moderately burned, and 3,635 acres (30%) had low mortality. Reforestation is recommended for 876 acres which constitutes a mix of burned over plantations and potential regeneration salvage areas. Stocking surveys, rodent trappings and seedling shade protection are recommended following planting. Potential salvage logging opportunities exist on 2,498 acres where high and moderate fire intensity occurred in

high-valued timbered stands. Finally, it is recommended that 45 permanent forest inventory plots be re-established.

Cultural Resources

A review of Cultural Resource Department (CRD) files identified three known cultural properties that are close to or within the fire suppression activities by the Waterfalls 2 Fire. The potentially impacted properties are the Historic Trail 21 (06-99-BL-017-03), the Peter's Pasture Civilian Conservation Corps (CCC) Spike Camp and Ranger Station (H-12), and the historic Lionshead portable sawmill (01-SCBL-91). The Lionshead portable sawmill was first recorded in 1992 (Martin) and revisited in 2003 (Keeton); the site has little to no integrity and is unevaluated to the National Register of Historic Places. Historic Trail 21 was recorded in 2006 (Gauthier), the trails first mile was noted as having little to no integrity and had been converted into a skid trail for logging purposes, Peter's Pasture has been used as a fire staging area since the 1930s, there are at least two historic structures within the Peter's Pasture area and due to the use of the area and potential for flood damage it is recommended that they are documented under the intensive level survey; as they are eligible to the National Register of Historic Places due to the association to President Roosevelt's New Deal Program in the 1930s.

The BAER Team Leader, Vernon Wolf, field verified the location of the dozer line in close proximity to site 06-99-BL-017-03 and determined that the dozer line did not impact the site.

In addition, over the last two years the Branch of Natural Resources (BNR) has been clearing trails for access to traditional use areas by the membership. The BNR crews had cleared over 5.3 miles of trails.

The CRD recommends monitoring of 01-SCBL-91, which may have been affected by fire suppression activities. The CRD further recommends an archaeological inventory of all dozer lines, drop points, staging areas, safety zones and other areas of ground disturbance related to the Waterfalls 2 Fire suppression efforts.

Monitored site along with any newly identified sites within the dozer lines, drop points, staging areas, safety zones and other areas of ground disturbance should be inventoried and identified sites will be documented on CTWSRO Tribal site forms.

The CRD further recommends that the 5.3 miles of trails be maintained for the next three years to maintain access for the tribal membership to conduct traditional cultural practices.

Wildlife

A number of federally listed Threatened and Endangered species have the potential to occur within the Confederated Tribes of Warm Springs Reservation. Three species, bull trout (*Salvelinus confluentus*), summer steelhead (*Oncorhynchus mykiss*), and northern spotted owl (*Strix occidentalis caurina*), occur within the burned area or immediate vicinity. There are no active northern spotted owl cores within the fire perimeter. Single birds have been detected in the last three years south of the fire perimeter within two active owl cores in the Whitewater River

drainage. Since the fire itself damaged suitable habitat, and northern spotted owls do not occur within the fire perimeter, it has been determined that all prescribed emergency stabilization activities would have "*no effect*" to northern spotted owls.

DEPARTMENT OF THE INTERIOR
BURNED AREA EMERGENCY RESPONSE PLAN

TABLE OF CONTENTS

DEPARTMENT OF THE INTERIOR
BURNED AREA EMERGENCY RESPONSE PLAN

SUMMARY of BAER TEAM RECOMMENDATIONS

Waterfalls 2 Fire

Soil Resources

- Rehabilitate 18 miles of dozer line
- Rehabilitate 20 miles of hand line

Watershed Resources

- Patrol watershed for potential debris removals
- Protect structure at Peter's Pasture
- Overflow protection at Noisy Creek bridge

Vegetation Resources

- Monitor for potential weed invasion of disturbed soils

Forest Resources

- Reforest 876 acres of commercial forest stands lost during the fire
- Seedling protection on 55 acres
- Monitor seedling survival
- Re-install 45 CFI plots

Cultural Resources

- Evaluate all documented known sites and clear all disturbed areas for rehabilitation.
- NHPA section 106 compliance

Wildlife Resources (T&E, Candidate Species)

- Written documentation of consultation with USFWS on T&E species

Infrastructure Resources

- Repair suppression damaged fences
- Re-grade impacted roads.

DEPARTMENT OF THE INTERIOR
BURNED AREA EMERGENCY RESPONSE PLAN

PART A - FIRE LOCATION AND BACKGROUND INFORMATION

Fire Name	Waterfalls 2
Fire Number	OR-WSA-000064-G49K
Agency Unit	BIA-WSA
Region	Northwest
State	OR
County(s)	Jefferson
Ignition Date/Cause	August 6, 2012, Lightning
Lat/Long	44.44.30 121.42.50
Date Controlled	
Jurisdiction	BIA
BIA/WSA	12,257
Total Acres	12,257
Fire Regime	3- 5
Condition Class	II
Date Contained	Estimated September 15, 2012

DEPARTMENT OF THE INTERIOR
BURNED AREA EMERGENCY RESPONSE PLAN

PART B NATURE OF PLAN

I. Type of Plan (check one box below):

	Short-term Rehabilitation (complete Parts A, B, C, and H only)
	Long-term Rehabilitation (complete all parts)
XXX	**Both Long and Short Term Rehabilitation (completed all parts)**

II. Type of Action (check one box below):

XXX	**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)

PART C STABILIZATION ASSESSMENT

I. Stabilization Objectives:

- Locate and stabilize severely burned slopes that pose a direct threat to human life, property or critically important cultural and natural resources.
- Recommend post-fire prescriptions that prevent irreversible loss of natural and cultural resources.
- As practical and necessary, restore natural conditions to areas disturbed by fire suppression actions.
- Conduct immediate post-burn reconnaissance for fire suppression related impacts to T&E species.
- Provide long-term monitoring recommendations intended to ensure the success of rehabilitation efforts.
- Prevent degradation of treatments to minimize impacts to T&E species.

II. Stabilization Recommendations:

- Treat all areas that were denuded by the fire as recommended by BAER team specialists utilizing approved seed and plant stocks as identified in the Integrated Resource Management Plan.
- Replace infrastructure such as undersized culverts, or log culverts as necessary to prevent extreme watershed damage within and below the burned area.

DEPARTMENT OF THE INTERIOR
BURNED AREA EMERGENCY RESPONSE PLAN

PART D - TEAM ORGANIZATION, MEMBERS, AND RESOURCE ADVISORS

I. Approval Authorities

Specify Agency (for multi-agency plans duplicate for each agency)

Activities Requiring Local Agency Administrator Approval Fire Suppression Damages (charged to Fire Suppression)	Status	Cost
DOZER LINE REHABILITATION	P	Acc Rpt
HANDLINE REHABILITATION	O	Acc Rpt
DOZER LINE ROADS	O	Acc Rpt
SURFACE GRADING	P	Acc Rpt
Subtotal		$

Status: C=Completed, O=Ongoing; P=Planned; Acc Rpt =Accomplishment Report

Activities Requiring Regional/State/Headquarters Approval **Emergency Stabilization (charged to ES)**	Status	Cost
Plan Preparation	P	$59,750
Flow Control Structure	P	$2,600
Storm Patrol	P	$10,800
Hazard Debris Removal	P	$0
Structure Protection	P	$5,368
Invasive Species Assessment/Monitoring	P	$12,435
Invasive Species Assessment/ Control	P	$0
Warning Signs	P	$2,571
Hazard Removal	P	$3,362
Historic Site Sect. 106 Documentation	P	$3,995
Implementation Leader	P	$10,200
Subtotal		**$111,081**

Status: C=Completed, O=Ongoing; P=Planned

Activities Requiring Regional/State/Headquarters Approval **Rehabilitation**	Status	Cost
Planting	P	$114,720
Seedling Procurement	P	$133,152
Stocking Surveys	P	$5,256
Pest Management	P	$35,040
Seedling Protection	P	$4,400
CFI Plot Reestablishment	P	$15,765
Trail Access	P	$6,724
Subtotal		**$315,057**

Status: C=Completed, O=Ongoing; P=Planned

II. BAER Team Members

SPECIALTY/PROFESSION	NAME/AGENCY	ASSESSMENT INCLUDED (Yes or No)
Team Leader/Forester	Vernon Wolf (CTWS)	No
Deputy Team Leader /Forester	Ryan Singleton (CTWS)	Yes
Resource Specialist/Wildlife	Andrea Karoglanian (CTWS)	Yes
Resource Specialist/Fisheries	Scott Struhs (CTWS)	Yes
Documentation Specialist	Theresa Morris (CTWS)	No
GIS Specialist	Marissa Stradley (CTWS)	No
Resource Specialist/Hydrology	Becky Biglow (BIA)	Yes
Resource Specialist/Hydrology	Jamie Sheahan	Yes
Resource Specialist/Soils	Brenda Sanchez	Yes
Resource Spec./Vegetation	Suzi Miller Hermens (CTWS)	Yes
Archaeologist	Sally Bird (CTWS)	Yes
Environmental Protection Spec.	Darryl Martinez	No

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

NAME	AFFILIATION, SPECIALTY, or PROFESSION
Bobby Brunoe	Natural Resource General Manager
Jim Rice	Forest Manager
Rich Botto	Planning Forester
Dan O'Brien	Timber Officer
Doug Dunlap	Road Engineer
Eric Phillips	Reforestation Forester
Brad Donahue	Tribal Asst. Fire Mgmt. Officer – Fuels
Trey Leonard	Fire Management Officer
Myron Hotinger	BIA-NIFC

PART E SUMMARY OF SPECIFICATIONS

EMERGENCY STABILIZATION

SPEC #	NFPORS CAT	PLANNED ACTION	UNITS	# OF UNITS	UNIT COSTS	FY12	FY13	FY14	FY15	TOTAL
ES1	Planning	Plan Preparation	Plan	1	$59,750	$59,750	$0	$0	$0	$59,750
ES2	Roads	Flow Control Structure	Stream Crossing	1	$2,600	$2,600	$0	$0	$0	$2,600
ES3	Roads	Storm Patrol	Patrol	18	$600	$0	$3,600	$3,600	$3,600	$10,800
ES4	Roads	Hazard Debris Removal	Site	0	$0	$0	$0	$0	$0	$0
ES5	Facilities & Infrastructure	Structure Protection	Feet	130	$41.29	$5,368	$0	$0	$0	$5,368
ES6	Monitoring	Invasive Species Assessment/Monitoring	Survey	3	$4,145	$0	$4,145	$4,145	$4,145	$12,435
ES7	Invasive Species	Invasive Species Assessment/ Control	Acres	0	$0	$0	$0	$0	$0	$0
ES8	Protection and Warning	Warning Signs	Sign	29	$89.67	$2,571	$0	$0	$0	$2,571
ES9	Trails	Hazard Removal	Miles	5.3	$634.33	$0	$3,362	$0	$0	$3,362
ES10	Heritage Resources	Historic Site Sect. 106 Documentation	Job	1	$3,995	$0	$3,995	$0	$0	$3,995
ES11	Administration	Implementation Leader	Job	1	$10,200	$10,200	$0	$0	$0	$10,200
Total						$80,489	$15,102	$7,745	$7,745	$111,081

REHABILITATION

SPEC #	NFPORS CAT	PLANNED ACTION	UNITS	# OF UNITS	UNIT COSTS	FY12	FY13	FY14	FY15	TOTAL
R1	Reforestation	Planting	Acres	876	$130.96	$0	$80,540	$22,918	$11,262	$114,720
R2	Reforestation	Seedling Procurement	Acres	876	$152	$0	$93,480	$26,600	$13,072	$133,152
R3	Monitoring	Stocking Surveys	Acres	876	$6	$0	$3,690	$1,050	$516	$5,256
R4	Reforestation	Pest Management	Acres	876	$40	$0	$24,600	$7,000	$3,440	$35,040
R5	Reforestation	Seedling Protection	Acres	55	$80	$0	$4,400	$0	$0	$4,400
R6	Facilities & Infrastructure	CFI Plot Reestablishment	Plot	45	$350.33	$0	$15,765	$0	$0	$15,765
R7	Heritage Resources	Trail Access	Miles	10.6	$634.33	$0	$0	$3,362	$3,362	$6,724
Total						$0	$222,475	$60,930	$31,652	$315,057

BURNED AREA EMERGENCY RESPONSE PLAN

2012 WATERFALLS 2

PART F EMERGENCY RESPONSE SPECIFICATIONS

PART F - INDIVIDUAL SPECIFICATION

TREATMENT/ACTIVITY NAME	Plan Preparation	**PART E SPECIFICATION #**	ES1
NFPORS TREATMENT CATEGORY*	Planning	**FISCAL YEAR(S) (list each year):**	2012
NFPORS TREATMENT TYPE *	ES/BAR Plan	**WUI? Y / N**	No
IMPACTED COMMUNITIES AT RISK	None	**IMPACTED T&E SPECIES**	N/A

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

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

Number and Describe Each Task:
A. General Description: To prepare the Burned Area Emergency Response (BAER) Plan for the High Cascades Complex.
B. Location/(Suitable) Sites: Warm Springs Reservation, Oregon
C. Design/Construction Specifications:
1. Conduct a detailed assessment of burn severity and determine fire impacts that need to be managed or mitigated.
2. Write specifications based on assessment recommendations.
3. Submit the plan for approval and secure funding from appropriate sources.
D. Purpose of Treatment Specifications: To prepare a comprehensive BAER plan to manage or mitigate fire impacts.
E. Treatment consistent with Agency Land Management Plan (identify which plan): Warm Springs Integrated Resource Management Plan, 2007

F. Treatment Effectiveness Monitoring Proposed: The plan details monitoring for treatment effectiveness as prescribed for each treatment specification. Annual and final reports will be prepared to document the treatment monitoring.

II. 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**
880 Regular hours @ $30/hr x 25% EBC = $33,000	$33,000
440 Overtime hours @ $45/hr x 25% EBC = $24,750	$24,750
TOTAL PERSONNEL SERVICE COST	**$57,750**

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.	**COST / ITEM**
TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST	

MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item):	**COST / ITEM**
Printing costs	$2,000
TOTAL MATERIALS AND SUPPLY COST	**$2,000**

TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item):	**COST / ITEM**
TOTAL TRAVEL COSTS	

CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):	**COST / ITEM**
TOTAL CONTRACT COST	

SPECIFICATION COST SUMMARY

FISCAL	**PLANNED INITIATION**	**PLANNED COMPLETION**	**WORK**	**UNITS**	**UNIT**	**PLANNED**	**PLANNED**

YEAR	DATE (M/D/YYYY)	DATE (M/D/YYYY)	AGENT		COST	ACCOMPLISHMENTS	COST
2012	08/26/2012	08/26/2013	FA	Plan	$59,750	1	$59,750
						TOTAL	**$59,750**

Work Agent: CA=Coop Agreement, FA=Force Account, G=Grantee, P=Permittees, SC=Service Contract, TSP=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
3.	**Estimate supported by cost guides from independent sources or other federal agencies**	
4.	**Estimates based upon government wage rates and material cost.**	M,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

III. RELEVANT DETAILS, MAPS AND DOCUMENTATION INCLUDED IN THIS REPORT:

List Relevant Documentation and Cross-Reference Location within the Accomplishment Report. See BAER Plans

PART F - INDIVIDUAL TREATMENT SPECIFICATION

TREATMENT/ACTIVITY NAME	Noisy Creek Bridge Protection: Overflow Dip Construction	**PART E Spec-#**	ES2
NFPORS TREATMENT CATEGORY*	Roads	**FISCAL YEAR(S) (list each year):**	2012
NFPORS TREATMENT TYPE *	Flow Control Structure	**WUI? Y / N**	N
IMPACTED COMMUNITIES AT RISK		**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:
A constructed and armored overflow dip to allow for control of high stream flows and will aid in protecting the bridge structure.

B. Locations:
Road P-400 bridge crossing with Noisy Creek

C. Design/Construction Specifications:
The armored overflow dip shall be constructed down-road and to the northeast of the bridge, beyond the bridge structure, but within 30 feet of the northeast end of the bridge.
Large boulders, available on site, should be keyed into the earth to armor the inlet and spillway of the overflow dip on both sides of the road tread, from the streambank to the road tread. The overflow dip in the road tread should be broad to allow for longer vehicles to pass through, approximately 7 feet wide, with a maximum depth of 18 inches. The dip within the road tread should be armored with cobble-sized rock.

Please see the specification drawing for overflow dip design in the appendix.

D. Purpose of Treatment Specifications (relate to damage/change caused by fire):
Increased runoff is expected in burned areas as a result of the Waterfalls 2 Fire, particularly in severely burned areas. Significant portions of the Noisy Creek watershed experienced moderate and high fire intensities and high soil burn severity and stream flows and quantities of channel debris transported by streamflows are expected to increase in Noisy Creek. An armored overflow dip will minimize potential sedimentation and channel instability of Noisy Creek caused by a potential road-stream crossing failure.

E. Treatment consistent with Agency Land Management Plan (identify which plan): This treatment is consistent with the Warm Springs Reservation Integrated Resource Management Plan, 2012.

F. Treatment Effectiveness Monitoring Proposed:
Inspection of roads should occur annually. Should further repair of drainage features be required to alleviate issues resulting from increased runoff in severely burned areas, then an amendment to the plan will be needed and submitted for review and approval by the BIA National BAER Coordinator.

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**
Inspector (on-the-ground) x 1 day	$200
TOTAL PERSONNEL SERVICE COST	**$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.	
Type 2 (111-155 HP) Excavator and operator @ $1200/day x 1day	$1,200
D-6 Dozer with 6-way blade with operator @ $1200/day x 1 day	$1,200
TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST	**$2,400**
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):	
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
2012	09/06/2012	09/30/2012	S, F	Stream crossing	$2,600	1	$2,600
						TOTAL	**$2,600**

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.	P, C, E, F
2. Documented cost figures from similar project work obtained from local agency sources.	P, C, E, F
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 Appendix for design drawing, Watershed Assessment.

PART F - INDIVIDUAL TREATMENT SPECIFICATION

TREATMENT/ACTIVITY NAME	Storm Patrol (roads, culverts, bridges)	**PART E Spec-#**	ES3
NFPORS TREATMENT CATEGORY*	Roads	**FISCAL YEAR(S) (list each year):**	2013, 2014, 2015
NFPORS TREATMENT TYPE *	Hazard Removal	**WUI? Y / N**	No
IMPACTED COMMUNITIES AT RISK	Warm Springs Reservation	**IMPACTED T&E SPECIES**	

* 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):

G. General Description:

Roads within and downstream of the Waterfalls 2 Fire contain drainage structures draining watersheds consisting of high to moderate burn severity. These streams now have the potential for increased runoff and debris flows, compromising structure stability. These increases in flows pose a threat to the existing crossings which may result in plugging drainage structures or exceeding their maximum flow capacity. If these flows plug drainage structures the result could be massive erosion and debris torrents further down the drainage due to the failure of fill slopes and road surfaces.

Also, there is an immediate and future threat to travelers along these roads within the burned area due to the increased potential debris slides and rock fall from burned slopes and increased potential for flash floods and mudflows. 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.

There are several places at risk of inundation, debris deposition, flood damage and other post-fire related impacts from elevated flows carrying sediment and debris. This post-storm assessment should identify culverts or bridges that are plugged or damaged. 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. Storm patrol observers will immediately notify implementation leader of any blockages and damaging debris jams for immediate removal (see Spec ES11).

H. Location/(Suitable) Sites: Several stream/road crossings in and below burned area will need to be patrolled: P400 and P40 at Noisy Creek, P400/P500 at Shitike Creek (Peter's Pasture), Thompson's Bridge on Shitike Creek, J100 on the Whitewater River, and bridges down in the lower ends of Shitike Creek in and around the town of Warms Springs. See treatment map for general areas. The total mileage for patrols is about 70 miles.

I. Design/Construction Specifications:

Storm Patrol Assessors will be responsible for the following tasks:

1. Immediately after receiving heavy rain the Confederated Tribes of Warm Springs BNR will send out patrols to the roads identified above to evaluate hazard conditions. This evaluation must consider obstructions such as rocks, sediment, washouts and plugged culverts so that the problems can be corrected before they worsen or jeopardize motor vehicle users.
2. The primary purpose of the patrol will be to rapidly assess the structure and roads for emergency hazard debris removal needs and mobilize appropriate equipment and crews for debris removal.

J. Purpose of Treatment Specifications (relate to damage/change caused by fire):

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 through the area. Qualified personnel will survey the roads within the fire perimeter after high-intensity storms and must inspect road surface condition, ditch erosion, and culverts/inlet basins for capacity to accommodate future runoff flows. The storm patrol should identify and address issues immediately after major rainfall events to avoid further damage during subsequent events.

K. Treatment consistent with Agency Land Management Plan (identify which plan): This treatment is consistent with CTWS, Warm Springs Tribal Code Chapter 441, Ordinance 77: Flood Damage Prevention Ordinance for the Warm Springs Indian Reservation, p1).

L. Treatment Effectiveness Monitoring Proposed:

Patrols and actions taken as a result of patrols should be documented for future reference. Documentation should include the estimated storm intensity and duration with a volume and a rate (# of inches rainfall in # of minutes) as well as any stream discharge or stage data available. It should also include photos of post-storm debris and the personnel or equipment mobilized for cleaning.

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 @$35/hour x 8 hours/day x 2 people x 6 events x 3 fiscal years	$10,080
TOTAL PERSONNEL SERVICE COST	**$10,080**
TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item):	

Fall/Spring Patrols: 4 X 4 pickup @ $40/day x 6 days x 3 fiscal years	$720
TOTAL TRAVEL COST	**$720**

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
2013	10/15/2012	10/15/2013	F	patrol	600	6	$3,600
2014	10/15/2013	10/15/2014	F	patrol	600	6	$3,600
2015	10/15/2014	10/15/2015	F	patrol	600	6	$3,600
						TOTAL	**$10,800**

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:

See Appendix, Watershed Assessment.

PART F - INDIVIDUAL TREATMENT SPECIFICATION

TREATMENT/ACTIVITY NAME	Hazard Debris Removal	**PART E Spec-#**	E4
NFPORS TREATMENT CATEGORY*	Roads	**FISCAL YEAR(S) (list each year):**	2013
NFPORS TREATMENT TYPE *	Channel Debris Removal	**WUI? Y / N**	N
IMPACTED COMMUNITIES AT RISK	Warm Springs Indian Reservation	**IMPACTED T&E SPECIES**	

* 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):

M. General Description:

Roads within and downstream of the Waterfalls 2 Fire contain drainage structures draining watersheds consisting of high to moderate burn severity. These streams now have the potential for increased runoff and debris flows, compromising structural stability. These increases in flows pose a threat to the existing crossings which may result in plugging drainage structures and exceeding their maximum flow capacity. If these flows plug drainage structures, the result could be severe erosion and debris flows further down the drainage due to the failure of surrounding fill slopes and road surfaces.

Upon being notified by storm patrol of debris plugs in culverts or bridges or other storm damage to roads, a crew will be mobilized to clear the bridge crossing from debris where severe erosion or road damage will occur and/or block those roads that are or have received damage.

N. Location/(Suitable) Sites: Several stream/road crossings in and below burned area are susceptible to debris jamming: P400 and P40 at Noisy Creek and P400/P500 at Shitike Creek (Peter's Pasture). See treatment map for general areas.

O. Design/Construction Specifications:

- Remove all down limbs and logs larger than approximately 3 inches small end diameter by 6 feet in length. Use chainsaws to buck wood into manageable pieces.
- Debris removal should be done by hand if safe conditions permit. In emergency situations, where handwork can not be safely undertaken, heavy equipment may be used to remove debris. Heavy equipment shall keep off of the stream banks and riparian area and accomplish work from the bridge and/or road surface.
- Removed debris should be set well above the bankfull channel.
- Pre-existing stable debris such as keyed in logs should not be removed.
- Avoid ground disturbance in the channel to the extent possible.
- Avoid cutting or otherwise disturbing live vegetation, including native junipers, willows, or other shrubs.
- The crew shall have access to equipment to cut up and remove debris.
- Store equipment, fuel and materials out of the riparian area and where chance of loss is low.

P. Purpose of Treatment Specifications (relate to damage/change caused by fire):

Remove floatable debris that blocks and restricts flow at the Noisy Creek Bridge on the P410 road and the Shitike Creek Bridge at Peter's Pasture.

Q. Treatment consistent with Agency Land Management Plan (identify which plan): This treatment is compatible with the CTWS Integrated Resources Management Plan and the CTWS Streamside Management Plan (1982, p15).

R. Treatment Effectiveness Monitoring Proposed:

Evaluate bridge periodically to ensure water passage and assess for damage to bridge. Photos of the channel and crossing should be taken pre- and post- debris removal.

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**
Tribal crew	
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.	
Chainsaw Rental	
Front-end loader and operator	
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):	
Equipment transport	
Road Clearing Access: 4 X 4 pickup: 60 miles x 2 days	
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
						TOTAL	

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.	
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 Appendix 1, Watershed Assessment.

PART F - INDIVIDUAL TREATMENT SPECIFICATION

TREATMENT/ACTIVITY NAME	Log Barrier: Peter's Pasture Structure Protection	**PART E Spec-#**	ES5
NFPORS TREATMENT CATEGORY*	Facility and Infrastructure	**FISCAL YEAR(S) (list each year):**	2012
NFPORS TREATMENT TYPE *	Protect Structures	**WUI? Y / N**	No
IMPACTED COMMUNITIES AT RISK	N/A	**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

High stream flows in Shitike Creek can be anticipated and the risk of flooding and mobilization of structures in Peter's Pasture is exacerbated due to expected increase in stream flows. A linear barrier of large logs, cabled together and anchored to the ground will serve to minimize impact of high stream flows and debris, and reduce the potential for mobilization and collapse of structures in Peter's Pasture. The log barrier should remain in place for a minimum of 3 years, though 7 years is recommended.

B. Location/(Suitable) Sites:

The log barrier structure should be placed on the west side of the concrete slab and 4x4 framed structure in Peter's Pasture, located on the south side of Shitike Creek. The log barrier structure will be 130 feet long at a 45° angle to the direction of flow of Shitike Creek. See specification drawing for further location details.

C. Design/Construction Specifications:

The log barrier shall be comprised of solid wood logs with a minimum length of 12 feet and a minimum diameter of 15 inches (however, larger diameter and longer length is preferred). The height of the log barrier structure needs to be 2.5 – 3 feet high.
Log alignment shall be staggered to minimize rotation of logs.
The log barrier shall be anchored using T-posts with the following dimensions: 5 feet long, 1.33 lbs./ft.
T-posts shall be spaced 5 feet apart on both side of the log barrier, and driven 18 inches into the ground.
5/8-inch diameter steel cable shall be tightened over the log structure between T-posts.
Bottom logs shall lie flush to the ground surface or be keyed into the ground.
Sandbags need to be placed in a single row along the base of the log barrier on both sides of the barrier.
The log barrier needs to be located according the placement specified in the construction drawing.
Use of heavy equipment in previously untracked areas to the west of structures in Peter's Pasture should be minimized.
(See construction specification drawing)

D. Purpose of Treatment Specifications (relate to damage/change caused by fire):

The upper portions of the Shitike Creek watershed experienced high intensity fire and soil burn severity, and increased stream flows are expected in Shitike Creek. Peter's Pasture structures lie within the floodplain of Shitike Creek and could be inundated by high stream flows. The log barrier will serve to minimize impact force to structures, particularly the metal building, from the force of water and debris, and reducing the potential for mobilization and collapse of structures due to flood flows.

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

CTWS Integrated Resource Management Plan, 2012

F. Treatment Effectiveness Monitoring Proposed:

The log barrier structure should be checked annually to insure that placement remains to specification.

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**
Log placement laborers: 5 laborers @ $160/day x 2 days	$1,600
TOTAL PERSONNEL SERVICE COST	**$1,600**
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.	

1 Excavator (111-155 HP) and operator x 2 days (including transport) @ $1200/day	$2,400
TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST	**$2,400**
MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item):	
Logs (available)	$0
Steel T-post, 1.33 lbs/ft. (5 foot): $6 post x 52	$312
Steel Cable, 5/8 –inch diameter, 160 feet total length	$900
Steel Cable Clamps (quantity: 52) $3/ea.	$156
TOTAL MATERIALS AND SUPPLY COST	**$1,368**
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 (M/D/YYYY)	PLANNED COMPLETION DATE (M/D/YYYY)	WORK AGENT	UNITS	UNIT COST	PLANNED ACCOMPLISHMENTS	PLANNED COST
2012	9/7/2012	10/30/2012	F, S	Feet	$41.29	130	**$5,368**
						TOTAL	**$5,368**

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, E
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 Watershed Assessment, Appendix I for Construction Specification Drawing

PART F - INDIVIDUAL TREATMENT SPECIFICATION

TREATMENT/ACTIVITY NAME	Invasive Species Assessment/ Monitoring	**PART E Spec-#**	ES6
NFPORS TREATMENT CATEGORY*	Monitoring	**FISCAL YEAR(S) (list each year):**	2013, 2014, 2015
NFPORS TREATMENT TYPE *	Ecosystem Recovery Monitoring	**WUI? Y / N**	No
IMPACTED COMMUNITIES AT RISK		**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:

Assess known locations within the burned area and or adjacent to the fire area within 6-8 months after fire containment to determine if noxious weeds will disperse seed onto the burned/disturbed sites. After vegetation green-up in spring of 2013 assess known noxious weeds/non-native invasive plant species on Warm Springs lands within the burn. Assess for possible invasions on roads, hand lines, dozer lines, and other disturbed areas within the perimeter of the fires and access roads leading to the fire. Approximately 12,257 acres of Warm Springs lands were impacted by the fires. Sites for examination should include existing locations and in areas that have a high probability for invasion within the burned area.

A search of noxious weed database revealed that noxious weed populations have not been located within the fire boundaries. Although, diffuse knapweed *(Centaurea diffusa.),* spotted knapweed (*Centaurea maculosa*) and Tansy ragwort (*Senecio jacobaea*) were noted during recent inventories along roadsides a few miles outside of the fire perimeter. These species are very aggressive and readily invade areas where the soil has been disturbed, posing a direct threat to native species re-establishment on disturbed sites.

Warm Springs: Assess areas that have a high potential for weed/invasive species establishment—the burned area and areas disturbed by fire suppression forces. Critical areas include roads, drainages, access roads leading off the main Highway 26 system. Disturbed areas within and along the fire perimeter, such as dozer lines, hand lines, and safety zones will also be prioritized for monitoring. Specific assessment areas include the dozer and hand lines, safety zones along roads near drop points, areas treated with straw mulch and the fire camp at the Warm Springs industrial site, including the weed washing stations.

C. Design/Construction Specifications:

1. Conduct short-term monitoring (growing season of 2013, 2014 and spring 2015) using early detection and rapid response (EDRR) assessment/monitoring of noxious weed/non-native invasive plant species infestations within the burned area. Monitoring to determine the post-fire presence or spread of invasive species will be conducted first at and near the known occurrences of weeds then in areas disturbed by the fire and fire suppression activities.

2. Natural re-vegetation of the burned area will be assessed in the spring/early summer of 2013 to determine whether there is sufficient recovery to preclude noxious weeds/invasive species**.** Assessment locations will be in areas representative that are not transitional from one ecological site to another or inclusions, using local agency specified methods. Should there be insufficient recovery, re-vegetation of native species should be considered, and a supplemental funding request for further monitoring and treatments should be triggered.

3. Inventory/assess, photograph and map new noxious weed infestations within burned area using Global Positioning System (GPS) technology.

D. Purpose of Treatment Specifications (relate to damage/change caused by fire):

This treatment is necessary to prevent the establishment and to monitoring the spread of existing noxious weeds and non-native invasive species into susceptible burned areas. Early Detection and Rapid Response (EDRR) will be used to prevent new noxious weed infestation from becoming established and to ensure the natural recovery of the native perennial grasses, forbs and shrubs. This treatment will also ensure the ecological indicators (Soil Stability, Hydrologic Function, and Biotic Integrity) are functioning properly during the natural recovery period on.

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

Warm Springs Integrated Resource Management Plan, 2012; Vegetation Management Plan and Environmental Assessment, 2004. These treatments will be compatible with the above plans.

LABOR, MATERIALS AND OTHER COST: (Costs are rounded)

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**

Year 2013 Rangeland Management Specialist, Weed supervisor @$47.37/hr X 20 hours x 3 yrs =	$2,842
TOTAL PERSONNEL SERVICE COST	**$2,842**
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):	
Government (GSA) vehicle @ $40/day X 14 days x 3 yrs =	$1,680
Government ATV/UTV @ 0.68/mile X 35 miles/day X 10 days x 3 yrs =	$714
TOTAL TRAVEL COSTS	**$2,394**
CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):	
Jefferson County @ $120.00 per hr x 20 hr x 1fiscal year x 3 yrs (Monitoring) =	$7,200
TOTAL CONTRACT COST	**$7,200**

SPECIFICATION COST SUMMARY

FISCAL YEAR	PLANNED INITIATION DATE (M/D/YYYY)	PLANNED COMPLETION DATE (M/D/YYYY)	WORK AGENT	UNITS	UNIT COST	PLANNED ACCOMPLISH MENTS	PLANNED COST
2013	10/01/2012	09/30/2013	S	Annual Survey	**$4145**	1	**$4,145**
2014	10/01/2013	09/30/2014	S	Annual Survey	**$4145**	1	**$4,145**
2015	10/01/2014	09/30/2015	S	Annual Survey	**$4145**	1	**$4,145**
						TOTAL	**$12,435**

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.	P. C, 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 Appendix I, Vegetation and Forestry Assessment; See Appendix I, Vegetation and Forestry Treatment map.

PART F - INDIVIDUAL TREATMENT SPECIFICATION

TREATMENT/ACTIVITY NAME	Invasive Species Assessment/ Control	**PART E Spec-#**	ES7
NFPORS TREATMENT CATEGORY*	Invasive Species	**FISCAL YEAR(S) (list each year):**	2013, 2014, 2015
NFPORS TREATMENT TYPE *	Chemical Treatment	**WUI? Y / N**	Yes
IMPACTED COMMUNITIES AT RISK	Warm Springs Reservation	**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:

Assess known locations within the burned area and or adjacent to the fire area within 6-8 months after fire containment to determine if noxious weeds will disperse seed onto the burned/disturbed sites. After vegetation green-up in spring of 2013 assess known noxious weeds/non-native invasive plant species on Warm Springs lands within the burn. Treat invasions on roads, hand lines, dozer lines, and other disturbed areas within the perimeter of the Fires and access roads leading to the fire. Approximately 12,257 acres of Warm Springs lands were impacted by the fire. Sites for examination should include existing locations and in areas that have a high probability for invasion within the burned area. Prioritize treatments to control the establishment and spread of noxious weeds.

A search of noxious weed database revealed that noxious weed populations have not been located within the fire boundaries. Although, diffuse knapweed *(Centaurea diffusa.),* spotted knapweed (*Centaurea maculosa*) and Tansy ragwort (*Senecio jacobaea*) were noted during recent inventories along roadsides a few miles outside of the fire perimeter. These species are very aggressive and readily invade areas where the soil has been disturbed, posing a direct threat to native species re-establishment on disturbed sites.

B. Location/(Suitable) Sites:

Warm Springs: Assess areas; the burned areas disturbed by fire suppression activities. Critical areas include roads, drainages, and access roads leading off Highway 26, roads on the Warm Springs lands. Disturbed areas within and along the fire perimeter, such as dozer lines, hand lines, and safety zones will also be prioritized for treatments. Specific treatment areas include the dozer and hand lines, dozer line, safety zones, drop points, areas treated with mulch and fire camp at the Warm Springs industrial site.

C. Design/Construction Specifications:

1. Natural re-vegetation of the burned area will be assessed in the spring/early summer of 2013 to determine whether there is sufficient recovery to preclude noxious weeds/invasive species**.** Should there be insufficient recovery, re-vegetation of native species should be considered, and a supplemental funding request for treatments will be triggered.

2. Treatment areas will be mapped using Global Positioning System (GPS) technology.

3. Chemical treatments using pickup, ATV and/or backpack spray units will be used on noxious weeds/non-native invasive species located within the fire perimeter. Other Integrated Pest Management (IPM) control methods will be employed as decided by the Warm Springs Natural Recourses Department. Coordination with Jefferson County and/or the Range and Agricultural Department for recommended herbicide use rates, suitable herbicides to use for specific weed species, and timing of application is essential for effective control.

4. Prepare annual reports and a final report documenting sampling methodologies, techniques, areas sampled, invasive species treated and success/failure of treatment, and summary of findings. Submit supplemental funding requests for subsequent years monitoring studies.

D. Purpose of Treatment Specifications (relate to damage/change caused by fire):

This treatment is necessary to prevent the establishment and to control the spread of existing noxious weeds and non-native invasive species into susceptible burned areas. Early Detection and Rapid Response (EDRR) will be used to prevent new noxious weed infestation from becoming established and to ensure the natural recovery of the native perennial grasses, forbs and shrubs. This treatment will also ensure the ecological indicators (Soil Stability, Hydrologic Function, and Biotic Integrity) are functioning properly during the natural recovery period on. Chemical treatment, as a part of an IRMP Vegetation Management Plan addressing new and existing noxious weed infestations, will help reduce the likelihood of non-native invasive species spreading to disturbed areas as well as enhancing the re-establishment of high quality wildlife habitat and diverse native plant communities within the burn.

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

Warm Springs Integrated Resource Management Plan, 2012; Vegetation Management Plan and Environmental Assessment, 2004. These treatments will be compatible with the above plans. Chemical treatment of invasive/noxious weeds is addressed in Vegetation Management, Noxious Weed Control Project Assessment, 2004

F. Treatment Effectiveness Monitoring Proposed:

Treatments will be evaluated annually for the next three years to ensure control methods are meeting resource objectives. Weed specialist/technicians will visit chemically treated sites within two weeks of treatment; this is especially important for weed populations that are sprayed to ensure efficacy of herbicide application. Initiate follow-up treatments if additional non-native species or new

infestations are discovered. Control will be considered successful upon determination that all noxious weeds have been controlled and non-native invasive plants have not spread beyond their pre-fire locations. Monitoring is required to ascertain whether vegetative recovery of habitat has, as anticipated, occurred. Additional treatments may be proposed if assessment concludes that the criteria for re-vegetation success are not achieved. A supplemental funding request for non-native invasive plant control will also be submitted if monitoring reveals expansion of noxious weeds from existing locations and if new infestations are found in the burn area.

LABOR, MATERIALS AND OTHER COST: (Costs are rounded)

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**
Year 2013 Rangeland Management Specialist, Weed supervisor @$47.37/hr X 40 hours x 3 yrs =	
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):	
Monitoring will determine the post-fire presence or spread of invasive species and will determine the extent of treatment needed.	
TOTAL MATERIALS AND SUPPLY COST	
TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item):	
Government (GSA) vehicle @ $40/day X 28 days x 3 yrs =	
Government ATV/UTV @ 0.68/mile X 35 miles/day X 20 days x 3 yrs =	
CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):	
Jefferson County @ $120.00 per hr x 40 hr x 1fiscal year x 3 yrs =	
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
2013	10/01/2012	09/30/2013	S	Acres	$0	0	**$0**
2014	10/01/2013	09/30/2014	S	Acres	$0	0	**$0**
2015	10/01/2014	09/30/2015	S	Acres	$0	0	**$0**
						TOTAL	

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.	P. C, 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 Appendix I, Vegetation and Forestry Assessment; See Appendix I, Vegetation and Forestry Treatment map.

PART F - INDIVIDUAL SPECIFICATION

PART F - INDIVIDUAL SPECIFICATION

TREATMENT/ACTIVITY NAME	Road Hazard/ Safety Signs	**PART E SPECIFICATION #**	ES8
NFPORS TREATMENT CATEGORY*	Protection and Warning	**FISCAL YEAR(S) (list each year):**	2012
NFPORS TREATMENT TYPE *	Warning Signs	**WUI? Y / N**	No
IMPACTED COMMUNITIES AT RISK	Warm Springs Reservation, Oregon	**IMPACTED T&E SPECIES**	

* 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):

Number and Describe Each Task:

A. **General Description:** This treatment is for the installation of flood and unstable tree and rocks warning signs notifying the public of dangers in the Shitike Creek Watershed as a result of wildland fire.

B. **Location/(Suitable) Sites:** Signs will be installed at the entrance of the P-410, P-440, P-450 and the P-510 forest roads. Signs will also be located at all trailheads and junctions along Trail 8, Trail 9, Trail 10 and Lionshead Trail.

C. **Design/Construction Specifications:**
- General area road signs will conform to Oregon's M.U.T.C.D. standards for Low-Volume Roads. Signs will be 36" X 36" made of high intensity orange retroflective color coated aluminum alloy (0.100" thick) with bold black font no less than 5 inches in height and also retroflective for night visibility. The color-coated aluminum shall have a temper that after coating and aging provides an ultimate strength of 30,000 psi and yield strength of 25,000 psi.
- Trail signs will be made of 12" X 14" corrugated/ honeycomb plastic board in white color with bold black lettering. All signs will read: "Entering Burn Area, Increased Risk of Floods, Falling Rocks and Falling Trees".

D. **Purpose of Treatment Specifications:** Provide tribal members, forest workers, traditional use and recreational users with the necessary information to be prepared for entry into a post-fire environment.

E. **Treatment Effectiveness Monitoring Proposed:** Implementation leader will verify installation and locations.

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**
1 Tribal Resource Technician @ $30.00 (X) 20 hours (X) 1 fiscal year =	
TOTAL PERSONNEL SERVICE COST	**$600.00**
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.	**COST / ITEM**
Post driver, wrenches, and misc. tools @ $150.00 per unit = $150.00	
TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST	**$150.00**
MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item):	**COST / ITEM**
4 signs 4' x 4' @ $300.00 each = $1,200.00	$1,200.00
4 steel u-shaped sign posts @ $40.00 per unit = $160.00	$160.00
8-3/8" machine bolts, nuts, and washers-carriage head @ $4.50 each = $36	$36.00
25 signs 14" x 12" @ $13 = $325	$325.00
TOTAL MATERIALS AND SUPPLY COST	**$1,721.00**
TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item):	**COST / ITEM**
1- 4x4 pickup @ $40.00/ day x 2.5 days x 1 fiscal year =	$100.00
TOTAL TRAVEL COST	**$100.00**
CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):	**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
2012	9/15/2012	10/31/2012	F	Sign	88.67	29	$2,571.00
						TOTAL	**$2,571.00**

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.	E, M, and P
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:

PART F - INDIVIDUAL SPECIFICATION

TREATMENT/ACTIVITY NAME	Short-Term Tree Hazard Mitigation	**PART E SPECIFICATION #**	ES9
NFPORS TREATMENT CATEGORY*	Trails	**FISCAL YEAR(S) (list each year):**	2013
NFPORS TREATMENT TYPE *	Hazard Removal	**WUI? Y / N**	No
IMPACTED COMMUNITIES AT RISK		**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):

Number and Describe Each Task:
A. General Description: Fell identified short-term tree hazards for the safety of the public within one tree length of and posing a threat to 5.3 miles of traditional use trails.
B. Location/(Suitable) Sites: Trail 9, Trail 10 and Lionshead Trail
C. Design/Construction Specifications:
1. Identify and mark tree hazards within one tree length of trails with blue paint and blue flagging using the NPS tree hazard and rating system.
2. Tree hazards with a rating of 5 or greater are to be marked for felling.
3. Directionally fell trees away from trails.
4. Stumps of identified tree hazards are to be flush cut as low as possible.
5. Leave all felled hazard trees at tree length (no bucking). Limb tree, cut and scatter limbs in lengths no more than four feet in length.
6. If trees cannot be felled safely, they are to be designated and left.
D. Purpose of Treatment Specifications: To ensure the safety of recreational and traditional trail users.
E. Treatment Effectiveness Monitoring Proposed: Post operation safety inspection.

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**
6 crew members @ $25/hour x 20 hours x 1 fiscal year	$3,000
TOTAL PERSONNEL SERVICE COST	**$3,000**
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.	**COST / ITEM**
TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST	**$0**
MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item):	**COST / ITEM**
Chainsaw usage @$35/day x 3 each x 2.5 days x 1 fiscal year	$262
TOTAL MATERIALS AND SUPPLY COST	**$262**
TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item):	**COST / ITEM**
1 4x4 crew-cab pickup @$40/day x 2.5 days x 1 fiscal year	$100
TOTAL TRAVEL COST	**$100**
CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):	**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
FY2013	10/1/2012	10/30/2013	F	Miles	634.33	5.3	$3,362
						TOTAL	**$3,362**

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
3.	Estimate supported by cost guides from independent sources or other federal agencies	
4.	Estimates based upon government wage rates and material cost.	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:

List Relevant Documentation and Cross-Reference Location within the Accomplishment Report. See Specifications map for trail locations.

PART F - INDIVIDUAL SPECIFICATION

TREATMENT/ACTIVITY NAME	Section 106 Documentation Peter's Pasture CCC Spike Camp	**PART E SPECIFICATION #**	ES10
NFPORS TREATMENT CATEGORY*	Heritage Resources	**FISCAL YEAR(S) (list each year):**	2013
NFPORS TREATMENT TYPE *	Site Treatment	**WUI? Y / N**	No
IMPACTED COMMUNITIES AT RISK	No	**IMPACTED T&E SPECIES**	No

* 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):

Number and Describe Each Task:
A. General Description: Conduct Section 106 documentation on historic structures within Peter's Pasture CCC Spike Camp (Site H-12)
B. Location/(Suitable) Sites: Peter's Pasture, P-400 road, Township 9 South Range 9 East, Section 34
C. Design/Construction Specifications:
1.
2.
3.
D. Purpose of Treatment Specifications: To meet legislative mandates of the National Historic Preservation Act and compliance with other Federal laws and/or regulations.
E. Treatment Effectiveness Monitoring Proposed:

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**
Historic Archaeologist $58/hr x 40 hrs = $2,320 Cultural Resource Technician $30/hr x 20 hrs = $ 600 Cultural Res. Mgr $95/hr x 5 hrs = $ 475	$3,395
TOTAL PERSONNEL SERVICE COST	**$3,395**

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.	**COST / ITEM**
TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST	

MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item):	**COST / ITEM**
Archival materials from BIA National Archives Records Administrative estimate cost for copies	$500
TOTAL MATERIALS AND SUPPLY COST	**$500**

TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item):	**COST / ITEM**
Two RT to project area: 90 miles x 2 x .555/mile	$100
TOTAL TRAVEL COST	**$100**

CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):	**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
2013	10/01/2012	9/31/2013	F	Job	$3,995	1	$3,995
						TOTAL	**$3,995**

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:

List Relevant Documentation and Cross-Reference Location within the Accomplishment Report.

PART F - INDIVIDUAL TREATMENT SPECIFICATION

TREATMENT/ACTIVITY NAME	Implementation Leader	**PART E SPECIFICATION #**	ES11
NFPORS TREATMENT CATEGORY*	Administration	**FISCAL YEAR(S) (list each year):**	2012
NFPORS TREATMENT TYPE *	Contract Administration	**WUI? Y / N**	No
IMPACTED COMMUNITIES AT RISK	None	**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):

Number and Describe Each Task:
A. General Description: Implementation Leader will have the responsibility for coordinating resources, contract development, crew supervision, and final signoff on completion of the treatments. Documentation on phases of the implementation will be reported on as requested by resource managers.
B. Location/(Suitable) Sites: All fires within the complex have at least one treatment, and most have multiple types of treatments to be implemented.
C. Design/Construction Specifications:
1. Consultation with local resource managers to determine preferred method of implementing treatments and reporting process.
2. Preparation of any contracts for work to be completed. Inspection of work will be ongoing.
3. Preparation of annual reports and final reports.
D. Purpose of Treatment Specifications: Insures dedicated staff person that is accountable for all aspects of treatment implementation. Encourages quicker implementation of treatment because position is dedicated to project work on this incident.
E. Treatment consistent with Agency Land Management Plan (identify which plan): Warm Springs Integrated Resource Management Plan, 2007
F. Treatment Effectiveness Monitoring Proposed: Not applicable.

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**
Tribal Implementation Specialist @ $40.00 x 240 hours x 1 fiscal year =	$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.	**COST / ITEM**
TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST	**$0**

MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item):	**COST / ITEM**
TOTAL MATERIALS AND SUPPLY COST	**$0**

TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item):	**COST / ITEM**
GSA 4WD Pickup 1 @ $40.00/day x 15 days =	$600
TOTAL TRAVEL COST	**$600**

CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):	**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
2012	9/15/2012	9/15/2013	F	JOB	10,200	1	$10,200
						TOTAL	$10,200

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:

List Relevant Documentation and Cross-Reference Location within the Accomplishment Report.

PART F - INDIVIDUAL TREATMENT SPECIFICATION

TREATMENT/ACTIVITY NAME	Planting	**PART E Spec-#**	R1
NFPORS TREATMENT CATEGORY*	Reforestation	**FISCAL YEAR(S) (list each year):**	2013, 2014, 2015
NFPORS TREATMENT TYPE *	Planting	**WUI? Y / N**	No
IMPACTED COMMUNITIES AT RISK		**IMPACTED T&E SPECIES**	NS Owl, Bull Trout, Steelhead

* 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: Reforestation of high mortality acres identified during aerial flights and by ground reconnaissance. All sites that have been identified for this treatment are void of adequate seed sources to regenerate the acres identified.

B. Location/(Suitable) Sites: Reforestation locations are all identified on the reforestation map Appendix Exhibit titled Reforestation.

C. Design/Construction Specifications: Waterfalls 2 Fire area will be planted with majority Douglas-fir and ponderosa pine and minor amounts of western larch and western white pine.

Trees on all units will be planted at a spacing of 8' x 8' resulting in an average of 680 trees per acre due to harsh sites and extensive rodent damage to ensure adequate stocking at rotation age.

D. Purpose of Treatment Specifications (relate to damage/change caused by fire): To maintain the ecological integrity of the area by re-stocking the operational areas the fire affected. To provide future forests, habitat and income to the tribes.

E. Treatment consistent with Agency Land Management Plan (identify which plan): Warm Springs Integrated Resource Management Plan, 2012.

F. Treatment Effectiveness Monitoring Proposed: Treatment effectiveness will be monitored utilizing stocking surveys.

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**
1 forester @ $35.00/hour x 8 hours/day x 10 days x 3 fiscal years=	$8,400
TOTAL PERSONNEL SERVICE COST	**$8,400**
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 4x4 pickup @ $40.00/day x 10 days x 3 fiscal years=	$1,200
TOTAL TRAVEL COST	**$1,200**
CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):	
Planting @ $120.00/acre x 292 acres x 3 fiscal years=	$105,120
TOTAL CONTRACT COST	**$105,120**

SPECIFICATION COST SUMMARY

FISCAL YEAR	PLANNED INITIATION DATE (M/D/YYYY)	PLANNED COMPLETION DATE (M/D/YYYY)	WORK AGENT	UNITS	UNIT COST	PLANNED ACCOMPLISH MENTS	PLANNED COST
2013	4/1/2013	6/30/2013	S	Acres	130.96	615	**$80,540**
2014	4/1/2014	6/30/2014	S	Acres	130.96	175	**$22,918**
2015	4/1/2015	6/30/2015	S	Acres	130.96	86	**$11,262**
						TOTAL	**$114,720**

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, C
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 Forestry Assessment. See Reforestation Map.

PART F - INDIVIDUAL TREATMENT SPECIFICATION

TREATMENT/ACTIVITY NAME	Seedling Procurement	**PART E Spec-#**	R2
NFPORS TREATMENT CATEGORY*	Reforestation	**FISCAL YEAR(S) (list each year):**	2013, 2014, 2015
NFPORS TREATMENT TYPE *	Cone Collection/Nursery Stock	**WUI? Y / N**	No
IMPACTED COMMUNITIES AT RISK		**IMPACTED T&E SPECIES**	NS Owl, Bull Trout, Steelhead

* 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: Seed/seedling procurement for reforestation acres identified during aerial flights and by ground reconnaissance. All sites that have been identified for this treatment are void of adequate seed sources to regenerate the acres identified.

B. Location/(Suitable) Sites: Reforestation locations are all identified on the reforestation map Appendix exhibit titled Reforestation.

C. Design/Construction Specifications: Waterfalls 2 Fire area will be planted with majority Douglas-fir and ponderosa pine and minor amounts of western larch and western white pine.

Trees on all units will be planted at a spacing of 8' x 8' resulting in an average of 680 trees per acre due to harsh sites and extensive rodent damage to ensure adequate stocking at rotation age.

D. Purpose of Treatment Specifications (relate to damage/change caused by fire): To maintain the ecological integrity of the area by re-stocking the operational areas the fire affected. To provide future forests, habitat and income to the tribes.

E. Treatment consistent with Agency Land Management Plan (identify which plan): Warm Springs Integrated Resource Management Plan, 2012.

F. Treatment Effectiveness Monitoring Proposed: Treatment effectiveness will be monitored utilizing stocking surveys.

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	**$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.	
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):	
TOTAL TRAVEL COST	**$0**
CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):	
Seed collection and processing @ $12.00/acre X 292 acres x 3 fiscal years=	$10,512
Seedling production @ $140.00/acre x 292 acres x 3 fiscal years=	$122,640
TOTAL CONTRACT COST	**$133,152**

SPECIFICATION COST SUMMARY

FISCAL YEAR	PLANNED INITIATION DATE	PLANNED COMPLETION DATE (M/D/YYYY)	WORK AGENT	UNITS	UNIT COST	PLANNED ACCOMPLISH MENTS	PLANNED COST

	(M/D/YYYY)						
2013	1/1/2013	10/30/2013	S	Acres	152	615	**$93,480**
2014	1/1/2014	10/30/2014	S	Acres	152	175	**$26,600**
2015	1/1/2015	10/30/2015	S	Acres	152	86	**$13,072**
						TOTAL	**$133,152**

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.	
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 Forestry Assessment. See Reforestation Map.

PART F - INDIVIDUAL TREATMENT SPECIFICATION

TREATMENT/ACTIVITY NAME	Stocking Surveys	**PART E Spec-#**	R3
NFPORS TREATMENT CATEGORY*	Monitoring	**FISCAL YEAR(S) (list each year):**	2013, 2014, 2015
NFPORS TREATMENT TYPE *	Treatment Effectiveness Monitoring	**WUI? Y / N**	No
IMPACTED COMMUNITIES AT RISK		**IMPACTED T&E SPECIES**	NS Owl, Bull Trout, Steelhead

* 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: Stocking surveys are done in the fall of each year on reforestation plantations to insure target stocking levels have been met on all units. This monitoring process is basis for re-treatment prescriptions if required.

B. Location/(Suitable) Sites: All areas and existing units that have been designated for reforestation within the burned area perimeter.

C. Design/Construction Specifications: Stocking survey design is to grid sample on a frequency of 1 plot per acre. Seedling survival is recorded, number of live trees, species, competition, and vector activity for this region of the reservation. Natural regeneration is also recorded on these plots; however, little or no seed source remains on these areas on this fire.

D. Purpose of Treatment Specifications (relate to damage/change caused by fire): : Insure that target numbers of seedlings specified in the forest management implementation plan are present on all commercial acres.

E. Treatment consistent with Agency Land Management Plan (identify which plan): Warm Springs Integrated Resource Management Plan, 2012.

F. Treatment Effectiveness Monitoring Proposed: N/A

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	**$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.	
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):	
TOTAL TRAVEL COST	**$0**
CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):	
Stocking Surveys @ 6.00/Acre x 292 Acres x 3 Fiscal Years=	$5,256
TOTAL CONTRACT COST	**$5,256**

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
2013	8/15/2013	11/30/2013	S	Acres	6	615	**$3,690**

2014	8/15/2014	11/30/2014	S	Acres	6	175	**$1,050**
2015	8/15/2015	11/30/2015	S	Acres	6	86	**$516**
						TOTAL	**$5,256**

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.	
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 Forestry Assessment. See Reforestation Map.

PART F - INDIVIDUAL TREATMENT SPECIFICATION

TREATMENT/ACTIVITY NAME	Pest Management	**PART E Spec-#**	R4
NFPORS TREATMENT CATEGORY*	Reforestation	**FISCAL YEAR(S) (list each year):**	2013, 2014, 2015
NFPORS TREATMENT TYPE *	Plantation Protection	**WUI? Y / N**	No
IMPACTED COMMUNITIES AT RISK		**IMPACTED T&E SPECIES**	NS Owl, Bull Trout, Steelhead

* 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: Based on historic results of stocking surveys gopher trapping will be required to maximize seeding survival

B. Location/(Suitable) Sites: All areas and existing units that have been designated for reforestation within the burned area perimeter will be treated.

C. Design/Construction Specifications: Traps will be placed at optimal locations within plantations to meet trapping objectives.

D. Purpose of Treatment Specifications (relate to damage/change caused by fire): Insure that target numbers of seedlings are surving to meet reforestation goals specified in the forest management implementation plan.

E. Treatment consistent with Agency Land Management Plan (identify which plan): Warm Springs Integrated Resource Management Plan, 2012.

F. Treatment Effectiveness Monitoring Proposed: N/A

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	**$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.	
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):	
TOTAL TRAVEL COST	**$0**
CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):	
Gopher Trapping @ 40.00/Acre x 292 Acres x 3 Fiscal Years=	$35,040
TOTAL CONTRACT COST	**$35,040**

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
2013	8/15/2013	11/30/2013	S	Acres	40	615	**$24,600**
2014	8/15/2014	11/30/2014	S	Acres	40	175	**$7,000**
2015	8/15/2015	11/30/2015	S	Acres	40	86	**$3,440**

TOTAL	**$35,040**

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.	
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 Forestry Assessment. See Reforestation Map.

PART F - INDIVIDUAL TREATMENT SPECIFICATION

TREATMENT/ACTIVITY NAME	Seedling Protection	**PART E Spec-#**	R5
NFPORS TREATMENT CATEGORY*	Reforestation	**FISCAL YEAR(S) (list each year):**	2013
NFPORS TREATMENT TYPE *	Plantation Protection	**WUI? Y / N**	No
IMPACTED COMMUNITIES AT RISK		**IMPACTED T&E SPECIES**	NS Owl, Bull Trout, Steelhead

* 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: Based on historic results of stocking surveys and professional experience, shade protection of seedlings on steep south-facing slopes will be required to ensure adequate seedling survival.

B. Location/(Suitable) Sites: All areas that have been designated for reforestation within the burned area perimeter that have south-facing slopes > 40% and no existing overstory shade will be treated.

C. Design/Construction Specifications: Shade cards will be installed on the southwest side of newly planted seedlings.

D. Purpose of Treatment Specifications (relate to damage/change caused by fire): Insure that target numbers of seedlings are surving to meet reforestation goals specified in the forest management implementation plan.

E. Treatment consistent with Agency Land Management Plan (identify which plan): Warm Springs Integrated Resource Management Plan, 2012.

F. Treatment Effectiveness Monitoring Proposed: Treatment effectiveness will be monitored utilizing stocking surveys.

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	**$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.	
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):	
TOTAL TRAVEL COST	**$0**
CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):	
Shade Carding @ 80.00/Acre x 55 Acres x 1 Fiscal Year=	$4,400
TOTAL CONTRACT COST	**$4,400**

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
2013	4/15/2013	6/30/2013	S	Acres	80	55	**$4,400**
						TOTAL	**$4,400**

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.	C
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 Forestry Assessment. See Reforestation Map.

PART F - INDIVIDUAL TREATMENT SPECIFICATION

TREATMENT/ACTIVITY NAME	CFI Plot Reestablishment	**PART E Spec-#**	R6
NFPORS TREATMENT CATEGORY*	Facilities and Infrastructure	**FISCAL YEAR(S) (list each year):**	2013
NFPORS TREATMENT TYPE *	Repair Administration Facility	**WUI? Y / N**	No
IMPACTED COMMUNITIES AT RISK		**IMPACTED T&E SPECIES**	

* 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: Locate and reestablish 45 Continuous Forest Inventory (CFI) plots on Warm Springs Indian Reservation that were damaged by the Waterfalls 2 Fire.

B. Location/(Suitable) Sites: Plots are all located within the burned area perimeter.

C. Design/Construction Specifications: Locate plots on the ground based on CFI data sheets location descriptions and assess damage to bearing trees and tree tags on each plot within the burn.

Establish new bearing trees if necessary, locate plot centers, and mark/retag all trees within the plot.

D. Purpose of Treatment Specifications (relate to damage/change caused by fire): Reestablish all CFI plot locations to maintain inventory growth records for the area.

E. Treatment consistent with Agency Land Management Plan (identify which plan): Warm Springs Integrated Resource Management Plan, 2012

F. Treatment Effectiveness Monitoring Proposed: Field checks by staff will insure work quality.

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**
1 Forester @ $35.00/hour X 8 hours/day X 12 days X 1 fiscal year =	$3,360
TOTAL PERSONNEL SERVICE COST	**$3,360**
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):	
Miscellaneous supplies, stakes, tags, flagging, paint, etc @ $15.00/plot x 45 plots =	$675
TOTAL MATERIALS AND SUPPLY COST	**$675**
TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item):	
GSA 4WD Pickups 1 @ $40.00/day x 12 days=	$480
TOTAL TRAVEL COST	**$480**
CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):	
Cost per plot is $250 X 45 plots X 1 fiscal year =	$11,250
TOTAL CONTRACT COST	**$11,250**

SPECIFICATION COST SUMMARY

FISCAL YEAR	PLANNED INITIATION	PLANNED COMPLETION DATE (M/D/YYYY)	WORK AGENT	UNITS	UNIT COST	PLANNED ACCOMPLISH	PLANNED COST

	DATE (M/D/YYYY)					MENTS	
2013	6/1/2013	10/30/2013	S	PLOT	$350.33	45	**$15,765**
						TOTAL	**$15,765**

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, 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 Appendices, Treatment Maps.

PART F - INDIVIDUAL SPECIFICATION

TREATMENT/ACTIVITY NAME	Traditional Use Areas – Trail Access	**PART E SPECIFICATION #**	R7
NFPORS TREATMENT CATEGORY*	Heritage Resources	**FISCAL YEAR(S) (list each year):**	2014, 2015
NFPORS TREATMENT TYPE *	Site Treatment	**WUI? Y / N**	No
IMPACTED COMMUNITIES AT RISK		**IMPACTED T&E SPECIES**	No

* 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):

Number and Describe Each Task:
A. **General Description:** Monitor and clear 5.3 miles of trails that will be affected by falling trees to make them useable for traditional use purposes by the tribal membership.
B. **Location/(Suitable) Sites:** Trail 9, Trail 10, and Lionshead Trail.
C. **Design/Construction Specifications:**
1. Identify and mark tree hazards within one tree length of trails with blue paint and blue flagging using the NPS tree hazard and rating system.
2. Tree hazards with a rating of 5 or greater are to be marked for felling.
3. Directionally fell trees away from trails.
4. Stumps of identified tree hazards are to be flush cut as low as possible.
5. Leave all felled hazard trees at tree length (no bucking). Limb tree, cut and scatter limbs in lengths no more than four feet in length.
6. If trees cannot be felled safely, they are to be designated and left.
7. Monitor trails for next two years for further tree hazards.
D. **Purpose of Treatment Specifications:** To meet legislative mandates of the National Historic Protection Act.
E. **Treatment consistent with Agency Land Management Plan (identify which plan):** Warm Springs Integrated Resource Management Plan, 2012.
F. **Treatment Effectiveness Monitoring Proposed:** Annual monitoring over the next three years will ensure clearance is meeting specifications.

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**
6 crew members@ $25.00/hour x 20 hours x 2 fiscal years	$6000
TOTAL PERSONNEL SERVICE COST	**$6000**
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.	**COST / ITEM**
TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST	**$0**
MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item):	**COST / ITEM**
Chainsaw use @ $35/day x 3 each x 2.5 days x 2 fiscal years	$525
TOTAL MATERIALS AND SUPPLY COST	**$525**
TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item):	**COST / ITEM**
1 4x4 crew-cab pickup @$40/day x 2.5 days x 2 fiscal years	$200
TOTAL TRAVEL COST	**$200**
CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):	**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
2014	6/1/2014	10/31/2014	F	Miles	634.33	5.3	**$3,362**
2015	6/1/2015	10/31/2015	F	Miles	634.33	5.3	**$3,362**
						TOTAL	**$6,724**

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, C
3.	Estimate supported by cost guides from independent sources or other federal agencies	

4.	Estimates based upon government wage rates and material cost.	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:

List Relevant Documentation and Cross-Reference Location within the Accomplishment Report. See Specifications map for trail locations.

TOTAL COST BY JURSIDICTION

JURISDICTION	UNITS TREATED	COST
	TOTAL COST	

DEPARTMENT OF THE INTERIOR
BURNED AREA EMERGENCY RESPONSE PLAN

PART G Post-Treatment Recommendations

Monitoring

- **Conduct Cultural Resource Site Assessments**
- **Monitor noxious weeds on the fire**
- **Watershed: See Watershed Assessment Part V, Section D for specific monitoring guidelines**

Part H Consultations

See Individual resource assessments.

BURNED AREA EMERGENCY RESPONSE PLAN

2012 WATERFALLS 2 FIRE

APPENDIX I RESOURCE ASSESSMENTS

- **WATERSHED & SOILS**
- **VEGETATION**
- **FORESTRY**
- **CULTURAL RESOURCE**
- **WILDLIFE**
- **OPERATIONS**

WATERSHED RESOURCE 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, sediment deposition;
- Develop soil burn severity map, watershed response maps, and watershed treatment maps;
- Develop treatment recommendations, if necessary;
- Identify future assessments or analysis needs;
- Identify future monitoring needs, if necessary.

II. ISSUES

Issues identified as possible post-fire watershed conditions that threaten life, property, and significant cultural and natural resources include:

- Water quality parameters such as turbidity and stream temperatures within Shitike Creek and Noisy Creek drainage will be reduced from normal conditions by short-term responses to wildland fire. There will be an expected increase in the delivery of sediment and organic debris downstream from the erosion of ash and mineral soil and the movement of woody and organic materials. These materials will be from the high soil burn severity and high tree mortality units located on the steep slopes of Shitike and Noisy Creek drainages. Moderate soil burn severity units may also influence turbidity where soil attributes and steep slopes increase the likelihood of soil erosion. Additionally, stream temperatures may increase in the summer months due to a reduction in riparian canopy cover in the headwaters reaches of Shitike Creek.
- Risk to property and infrastructure from increased post-fire flow events and debris within the Waterfalls 2 Fire and downstream in the Shitike Creek Watershed.

III. OBSERVATIONS

The purpose of a burned area assessment is to determine if the fire caused emergency watershed conditions and if there are potential values at risk from these conditions. Identification of values at risk occurs through consultation with individuals, tribal, and federal agencies, and through field investigation. 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 and resources to be protected are analyzed, and treatment prescriptions are developed to protect values at risk.

The most significant factor leading to emergency watershed conditions is loss of ground cover. This widespread reduction of live vegetation, woody debris, leaf litter and duff may lead to soil

erosion and changes in the hydrologic function of the watershed by decreasing infiltration and increasing the magnitude and velocity of surface water runoff. Such conditions may lead to an increase in flooding, sedimentation and deterioration of the soil system. Values at risk are human life and property located within or downstream of the fire that may be subject to damage from flooding, ash, mud, debris deposition, and hillslope erosion.

Reconnaissance Methodology

Aerial reconnaissance survey, satellite reconnaissance, and field evaluations were conducted by the watershed team to identify the spatial distribution and extent of the fire severity and resulting burn severity, soil conditions, and stream and road crossing conditions. USGS stream gauging data, ArcGIS LIDAR analysis, and field measurements of channel and floodplain dimensions were used to assess the risk of flooding and debris damage to bridges and structures in the Shitike Creek floodplain. Field evaluations included but were not limited to:

- Edaphic fire effects
- Areal extent and strength of hydrophobic soil conditions
- Mapping of burn severity
- Current channel and culvert capacities
- Elevations of near-stream structures
- Threats to infrastructures from storm flow and debris

The watershed team evaluated site indicators to rate burn severity and identify potential areas of excessive watershed damage. The mapping criteria were: soil hydrophobicity or water repellency, ground cover density, released sediment, and slope. Four site conditions are used to identify severity: ash color, ash depth, fire intensity, and soil structure. These criteria indicate fire residence time, depth of litter layer consumed, and sediment available for transport. Other observations, such as fibrous root condition of ground plants, diameter of fuels consumed, needle cast potential, and scorch height were also noted where applicable. All of the above criteria are used to identify emergency watershed conditions and threats to other resources.

Assessment Criteria

Soil Conditions

Edaphic fire effects were evaluated for several parameters that affect soil conditions. These parameters are hydrophobicity, changes in vegetative ground cover, soil structure, and susceptibility to water erosion. Hydrophobicity was evaluated by observing the depth and thickness of water repellent horizon in surface soils where it exists, and duration of a water drop beading on this surface. Changes in vegetative ground cover as affected by the fire were noted and compared to pre-fire conditions. Loss of soil structure is usually indicated by a change in soil structure to a fine powder.

Formation of Hydrophobic Soil

When soils are heated by fire one result can be the development of a hydrophobic layer on or in the surface soil horizon. This occurs due to volatilization of organic matter in and on the surface soil that have high amounts of lignin and other waxy compounds. After the fire passes, the gasses cool to a waxy coating on soil particles. If the hydrophobic layer is thick, or degree of water repellency is strong, it can seriously inhibit infiltration of rainfall, increase runoff and detach

surface soil particles, thereby increasing flooding, erosion and sedimentation. Cooler short duration fires will cause repellency at the surface and hotter longer duration fires will produce repellency at greater depths. The longevity of water repellency post-fire is hard to predict because it is attributed to soil types, organic matter content, soil temperature, and climate characteristics, but a general statement of 1-3 years could be used to designate the longevity of this condition. The Water Drop Penetration Time Test was used to determine if burned soils would have a hydrophobic response.

Overview of Soil Burn Severity
Mapping soil burn severity (SBS) is intended to illustrate the degree to which certain soil characteristics have been altered by fire; it is not a map of vegetation consumption. The following parameters were evaluated in order to rate soil burn severity:

- Amount and condition of surface litter and remaining duff,
- Soil aggregate stability
- Amount and condition of remaining fine and very fine roots
- Surface infiltration rate (water repellency)
- Ash depth
- Changes in soil color
- Pre-fire vegetation vs. post-fire vegetation conditions
- Pre-fire soil vs. post-fire soil conditions
- On-site interdisciplinary discussions and summations of SBS by resource professionals.

All of these factors provide inferences specific to understanding how fire intensity has affected changes in the soil, which are rated or classed into three soil severity designations: low, moderate, and high.

While soil burn severity is not based primarily on fire effects to vegetation, the team also utilized the results of the Burned Area Reflectance Classification (BARC) satellite imagery. After field visits and determinations of SBS, GPS points were taken and then used to correct the BARC imagery to provide a more actual determination of SBS within the fires perimeter.

Below are listed the soil and site condition attributes used to determine SBS in the fire's perimeter*:*

Unburned and Low Soil Burn Severity
These areas were characterized by incomplete consumption of both ground and canopy fuels indicating there was negligible soil loss. An adequate effective ground cover remains in the form of large cobbles or stones, biological soil surface crusts, grass crowns, trees, and surface organic material. Ash was usually black and remained intact.

Moderate Soil Burn Severity
These areas were characterized by moderate to high consumption of the shrub percent effective soil cover. Soil structure was generally not affected and the presence of fine roots was noted in 90 percent of the areas sampled. Tree mortality in these areas is expected to range from 40 to 70 percent. Dead standing stems characterized approximately 25 percent of the moderate soil burn severity areas. These areas have potential for accelerated soil erosion except in areas of high tree

mortality coupled with incomplete needle consumption. Needle cast in these areas will provide immediate soil cover, which will reduce the likelihood of soil erosion.

High Soil Burn Severity
These areas experienced high consumption of both the canopy and ground fuels. Downed large woody ground fuels and ladder fuels were also consumed. Hot spots occurred in areas with 100 hour-plus ground fuels, fire related tree falls, and stump burn out areas. Dead standing stems characterize most of these areas. Many of these standing snags are high-risk trees for re-burning and/or falling without warning.

Soil Erosion
The potential for soil erosion following a fire is generally increased over pre-fire potential. This is largely due to the loss of soil cover, a reduction in soil organic matter, responsible for structural stability, and in some cases, increased water repellency at or near the soil surface. The change in these soil properties and conditions between pre and post-fire, relates to the degree or extent of a soil's potential to erode.

The factors most affected by fire are: 1) the amount of effective soil cover, 2) the inherent susceptibility to soil particle detachment by wind, water, or gravity (a function of soil texture and structural stability), and 3) the surface infiltration rate. Areas of high soil burn severity can be expected to show a larger increase in sediment production than an area of low soil burn severity due the associated decrease in soil cover, increase in susceptibility of soil particle detachment, and decrease in the infiltration capacity of the soil. It is important to understand pre-fire erosion behavior when assessing post-fire erosion, since some areas have water repellant surfaces and inherently high erosion potential even before the fire.

The hazard from rockfall and falling debris on very steep slopes may be increased below burn areas due to spalling of rock, and loss of vegetation and roots supporting logs, rocks, and other debris. Spalling of rock occurs as a result of unequal heating of rocks in fire that causes rocks to shatter into potentially more mobile pieces. Rock, soil, logs, and other debris often accumulate behind trees and other vegetation on steep slopes. Loss of this vegetation during a fire can destabilize this material leading to an increased potential for mobilization downslope.

Hydrologic Modeling and Watershed Response
Post-fire watershed response in the Shitike Watershed was calculated using a combination of methods and models in order to best anticipate the expected response to match professional judgment and field observations. In this assessment the Watershed Group utilized the USGS Regression Equation for East Cascades region of Oregon to model post-fire watershed response of Shitike Creek. The USGS Regression method is the most commonly used post-fire runoff estimation method by BAER team members Inputs to the USGS Regression equation included: total watershed area, square miles of high and moderate burn severity, mean annual precipitation, and pre-fire peak flow estimates for desired recurrence intervals from a gauged site.

Watersheds were delineated in ArcGIS using 10m Digital Elevation Models (DEM). Subwatershed drainage areas were delineated for Shitike Creek above the Peter's Pasture Bridge, and the Noisy Creek drainage. The USGS regression equations for Oregon East Cascades and

North Central Oregon were also assessed for estimating pre-fire peak flow recurrence, but the estimates did not reflect gauging data. Therefore, pre-fire peak flow recurrence intervals were obtained from the Oregon Water Resources Department Peak Flow Estimator online tool for gauged sites at Shitike Creek at Peter's Pasture and Shitike Creek at near Warm Springs, OR using the weighted peak flow estimates (derived from historic gauge data and NRCS curves in Cooper, 2006). The area of moderate and high burn severity input into the USGS regression model was determined from the calibrated BARC image to field verified soil burn severity. The inputs and outputs to the USGS regression models are included in the Watershed Appendix.

Valley floodplain and stream channel cross-sections were used to estimate the stream flow capacity of the channel at points of interest for assessing flood risk to structures. Cross-sections were generated in ArcGIS using the 3D Analyst tool over the LIDAR (1 foot) DEM. Average channel stream velocity was conservatively assumed to be 5 ft/sec, in agreement with channel data from high flow events at the gauging station. Channel dimensions and structures at potential risk from flooding were verified in the field. Structures that were deemed at risk from increased flows from a post-fire 25-year event peak flow were further assessed for values and protection need.

Overview of Watersheds Within Waterfalls 2 Fire Perimeter

Climate

The Warm Springs Reservation (WSR) spans approximately 646,000 acres. Its borders are the Cascade Mountains crest to the west, the Deschutes River to the east, Metolius River to the south and the to the north are basalt plateaus leading to the Columbia River. This vast land base encompasses a wide variety of landscapes and ecosystems. The highest point on the reservation is marked by the summit of Mt. Jefferson at 10,497 feet. Elevation drops down to 1,000 feet along the Deschutes River in the reservation's northeastern corner.

Because of the difference in elevation and topography across the reservation, two very distinct climate types prevail. The Cascade Mountains along the western areas are subject to seasonal rains, frequent storms, and a winter snowfall often exceeding 200 inches. The 120 inches of annual precipitation that falls in the mountains help to maintain a large timber base as well as form a solid backbone for the headwaters of many of the reservation's streams. The eastern rangelands are located on the leeward side of the Cascades and the amount of precipitation here drops dramatically, averaging less than 12 inches per year.

Within the Waterfalls 2 Fire burned area, annual precipitation of 135 inches in the headwaters of Shitike Creek to 55 inches in the Peter's Pasture area. In the Upper Shitike Watershed, which encompasses the burned area, precipitation falls as rain in the October-December, as snow December-April, followed by melting snow and rain-on-snow events in the late spring, and a dry summer season of occasional thunderstorm activity. Precipitation generally originates over the Pacific Ocean in an easterly direction, with the occasional southwesterly "pineapple-express", an atmospheric river of moisture and warm air that typically results in rain-on-snow and rapid snowmelt.

Hydrology

The Waterfalls 2 Fire burned within the Shitike Creek, Whitewater River, and Mill Creek watersheds (Table 1). The vast majority of the fire burned in the headwaters of the Shitike Creek watershed, the focus of this assessment.

Watershed Acres Burned, Waterfalls 2 Fire					
Watershed Name	Burned acres	Unburned acres	Total watershed acres	Percent of watershed burned	Percent of burn by watershed
Shitike Creek Watershed	10,649	44,010	54,659	19%	87%
Upper Shitike	10,604	3,456	14,059	75%	87%
Whitewater River Watershed	1,371	19,318	20,688	7%	11%
Boulder/Mill Creek Watershed	238	50,267	50,504	0%	2%
Total	12,257	113,595	-	-	100%

The Shitike Creek Watershed, including Tenino Creek downstream encompasses approximately 105 square miles from an elevation of 7018 feet at the Cascades crest to 1,383 feet at the confluence of the Deschutes River below the town of Warm Springs and the lumber mill. In the upper portion of the watershed above Peter's Pasture, Shitike Creek is characterized by reaches of high gradient stream with an abundance of log jams, intact riparian areas, and interspersed with broad floodplains and meadow complexes. The headwaters of Shitike Creek have been considered pristine, contributing stability to the entire Shitike Creek Watershed. Downstream of Peter's Pasture, Shitike Creek is entrenched in a straight canyon, to where it then opens up again with a broad valley floodplain from near Thompson's Bridge to its confluence with the Deschutes River.

Shitike Creek stream flow gauges provide data into peak flow and flood history. The USGS operates two gauges in the Shitike Watershed:

- USGS 14092750: Shitike Creek ¼ mile below Peter's Pasture
  Daily data from 1982-present
  Drains 22.9 square miles
  Elevation 3,580 feet

- USGS 14093000: Shitike Creek near the town of Warm Springs
  Daily data from 1996-present (gauge was moved from Thompsons Bridge).
  Drains 104 square miles
  Elevation 1,380 feet

The Shitike Creek Watershed is dominated by snowmelt runoff, with the majority of discharge occurring with snowmelt in late spring. Shitike Creek does have a history of flooding in the

lower reaches. The largest floods were the 1964 flood and the 1996 flood (estimated 2,430 at Peter's Pasture and 3,600 cfs at Thompson's Bridge), which were initiated by high intensity rain-on-snow events, causing extensive damage to bridge crossing, residences, and infrastructure in Warm Springs. Floodplain management and land use along the lower Shitike has evolved in response to the damaging floods of 1964 and 1996. The Tribes have instituted a Flood Damage Prevention Ordinance (Ordinance 77) to reduce the risk of damage to property and life, from large flood events by prevent building of infrastructure in the floodplains and floodways. The Tribes have also designed levee breaks designated floodways to permit natural flood processes. The CTWS Branch of Natural Resources have also implemented floodplain restoration projects in the lower reach to further slow flood velocities and reduce damages in Lower Shitike.

Geology

The Waterfalls 2 Fire occurred primarily within the hydrologic boundaries of Shitike Creek Watershed and the Whitewater River Watershed (Table 1). This area of the Warm Springs Reservation is a highly diverse landscape of mountains, plateaus, and river canyons, spanning from the leeward summit of Mt. Jefferson and trailing eastward to the Deschutes River.

Mt. Jefferson is a late Quaternary (approximately 300-400,000 years ago) stratovolcanoe composite cone made of several layers of basalt, dactite, and andesite lava flows located within the central Oregon Cascades Mountains and comprises the high elevation boundaries of the fire's perimeter. Mt. Jefferson was quite active between 35,000 to 100,000 years ago with the last eruption occurring around 35,000 years ago. Covering the eastern and northern flanks of Mt. Jefferson is Whitewater Glacier, a remnant of the last glacial event and is a source of surface and groundwater flow on the WSR. Other geologic features found within the fires perimeters are dome and cinder cone fields, glacial deposits of deeply weathered till forming moraines and drift sheets, lava flows, and pyroclastic ash flows.

Soil

The burn area contained 24 different National Cooperative Soil Survey (USDA-NCSS) soil-map units (see table in Appendices). Below is a brief narrative of the dominant soils present within the fire's perimeter.

In general, soil types found within the fire's perimeter are formed from mixed sources of alluvium (materials deposited by water) and colluvium (materials deposited by gravity) of volcanic rock, pyroclastic ash flows, and glacial till and outwash. Soil depths range from moderately deep (30-60 inches) to very deep (over 60 inches). Surface soils contain very fine to coarse roots and organic matter content ranges from 1-8 percent in the upper 10 inches of most soils found in the fires perimeter. Soil temperature and moisture regimes are cold, cool and wet throughout the growing season.

Soil textures in the Shitike Creek Watershed are mostly coarse-textured fine sandy loam to sandy loam (sand content ranges from 50-70 percent). The sandy loam textures of these soils combined with high rock content (up to 50 percent content) indicate soil permeability is rapid to very rapid and most are somewhat excessively drained to well drained.

Hydrologic Soil Groups (HSGs) (USDA Soil Survey) classifications are based on soil type, intake and transmission of water under the conditions of maximum yearly wetness, bare soil surface, non-frozen soil, and the maximum swelling of expansive clays. The HSGs range from A-D and three classifications can be found throughout the fires perimeter. The major majority of soils are grouped into HSGs A and B. Groups A and B are soils which have a potential for low to moderate surface runoff and when precipitation events occur water will enter the soil easily and rapidly with moderate to very little surface runoff.

Soils within the fire's perimeter of the Shitike Creek Watershed are relatively young with moderate to fine or weakly developed subangular blocky to granular soil structure. Poorly or weakly developed soils have an increased potential for soil aggregates to breakdown more so than well developed soils during high soil burn severity situations and are more susceptible to particle detachment associated with erosion of soil by wind or water.

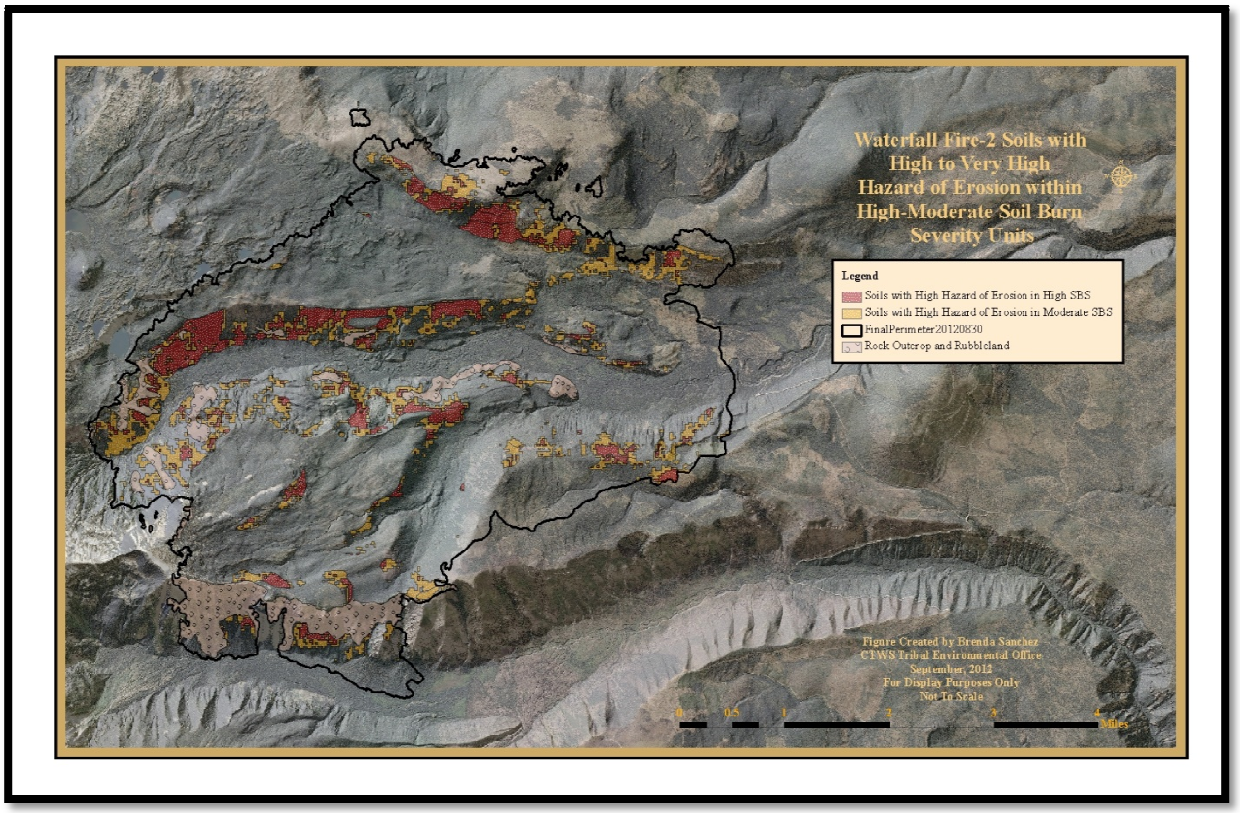
Soil Erodibility of Waterfalls 2 Fire Perimeter

Soil erodibility is an estimate of the ability of soils to resist erosion, based on the physical properties of each soil type. Generally, soil with faster infiltration rates, higher levels of organic matter, and well-developed soil structure have the greatest resistance to erosion. Sand, sandy-loam, and loam-textured soils tend to be less erodible than silt, very fine sand, and certain clay-textured soils. An important attribute to consider during the BAER assessment of the soil resource is the hazard of soil erosion as determined by slope and K.

The Revised Universal Soil Loss Equation is an erosion model and a way to quantitatively estimate soil loss. One component of the equation (K) is known as the soil erodibility factor and ranges from low (0.05) to high (> 0.4); K-value is based on soil type. This is simply an index that classifies soil for its erodible nature; the K-value for soil in the Shitike Creek Watershed ranges from 0.10 (sandy loams such as Piumpsha and Howash soil mapping units #107 and #46-#53) to 0.28 (fine sandy loams such as the Belrick soil mapping units # 9 and # 24).

Soils most susceptible to erosion within the fires perimeter are those with a high to very high index for the Hazard of Erosion (USDA Soil Survey). Soil types with these ratings such as Howash, Jojo, and Pipp soil-mapping units have the most potential for severe erosion. These soils are at an increased risk due to the influence of steep slope locations (30-70 percent) rather than the K value (0.10). These soils total 4,268 acres and comprise 34.8% of the fire perimeters soil. They are located on the very steep north and south -facing headwalls and side slopes of Shitike Creek Canyon and the southwest aspects of Noisy Creek drainage.

Figure 1: Image of the Waterfalls 2 Fire Perimeter Illustrating Areas with High to Very High Potential for Hazard of Erosion and Rock Outcrops.



IV. FINDINGS

Hydrophobicity

Soils did show evidence of hydrophobicity at several soil data collection sites throughout the fire's perimeter. The watershed team used the Water Drop Penetration Test at several sites. Water drops were applied to bare mineral soil after ash was removed. Water drops ponded and settled onto the mineral soil surface for more than five seconds and less than two minutes before infiltration. These areas are where high soil burn severity has been predicted and in soils that contained high amounts of organic matter (4-6 percent). Other hydrophobic soils were discovered in moderate tree mortality units where the understory was dense and timber fall was ample. In these units the ash layer was much thicker indicating longer fire residence time with higher amounts of organic matter consumed

Soil Erosion

The Erosion Risk Management Tool (ERMiT) was used to estimate erosion, on burned and recovering forest systems. ERMiT combines rain event variability with spatial and temporal variability of soil burn severity and soil properties. ERMiT produces a distribution of rain event sediment delivery rates with a probability of occurrence for each of the five post-fire years. Five hillslope locations were chosen for modeling the probability of a given amount of sediment delivery from the base following high and moderate burns in the Shitike Creek Watershed. Slopes run through the ERMiT model were located on the steep sloped soil-mapping units #47 and #53. These soil mapping units are located in the areas where hydrophobic soils were encountered in high soil burn severity units of the northwest headwalls of Shitike Creek and northwest slopes above Noisy Creek.

In all the model runs (see results table in appendices), results consistently indicate there will be a 20 percent probability of exceeding normal sediment yields in the Shitike Creek Watershed during a significant rain event. Simply stated there is a 20 percent chance during the next five years that sediment yields will be increased over the normal yield during a significant rain event. Meaning more than average sediment amounts will be released as a result of erosional processes occurring in areas impacted by wildland fire and soil burn severity was high.

Results for high soil burn severity soils in the first-year indicate sediment yields would be similar in both treated and untreated units. However, in the second year post-fire there will be a significant amount of sediment delivery from areas not treated over areas that were. In most of the model runs sediment yield exceedance in the second year was between 40- 48 percent over the treated areas. It should be noted ERMiT does not consider the results of first and second year growing seasons of regenerated ground cover and natural mulching such as needle cast. In moderate soil burn severity units, results were very similar for the first year, very little change in the amount of sediment yields from treated versus untreated areas. However, in year two, sediment yields will be markedly increased from untreated areas over treated areas.
The units where soil erodibility is increased as a result of the Waterfalls 2 Fire are found in the high – moderate soil burn severity units experienced in the northwest upper headwalls of Shitike Creek canyon, downstream to the bridge at Peter's Pasture along the side slopes, and the steep southwest facing slopes of Noisy Creek. Although these soils are more prone to erosive conditions from slope position and the severity of soil burn, erosion and runoff may be alleviated due to the fact that these soil types are rated in the HSGs-A, have a rapid to very rapid runoff potential, and moderate to rapid infiltration which should balance out the severe potential and reduce this area to a moderate-severe potential for soil erosion. It is these same soil-mapping units where water repellency (hydrophobicity) was experienced in field visits by the watershed team.

During significant rainfall events precipitation will displace and erode ash, surface soil, and organic debris from the high to moderate soil burn severity units. Surface flow will pick up and move these materials downslope and eventually downstream. There will be pulses of turbid waters with floating sediment and debris expected during the first wet season. Water clarity may decline over the normal accustomed clear waters of Shitike Creek. Sediment-laden streamflow can be more prone to aggradation (spreading out over bankfull), activating flood plains, and depositing sediment, gravel, and debris throughout the main stem.

Because the fire burned in a mosaic pattern of varying intensities a great deal of live, healthy, and deeply rooted vegetation remains interspersed throughout the fires perimeter to filter ash and sediment released from the bare-ground of high burn severity and high tree mortally units. Furthermore, attributes of the soils found on the mid and toes slopes

of Shitike canyon such as texture, organic matter content, rock content, and high soil moisture content will help to maintain the watershed's function of water capture and storage, by rapid infiltration of precipitation and snowmelt on the ridges, shoulder and mid-slopes and water release from the fine sandy loams of the toeslopes and canyon river bottom of Shitike Creek. These factors should have a high influence and lesson or mitigate the likelihood of severely turbid waters. However, predicting the magnitude of the response can be problematic due to the

unknowns of climate, weather, and rugged terrain.

Stream temperatures could be warmer in the 2013 summer months over the normal cool cold temperatures in a short-term response to losses of the far upstream riparian canopy cover. The loss of cover will reduce shade and alter the storage and release functions of Shitike Creek headwaters possibly releasing cold water stored in the system sooner. This factor could be further exasperated by increased sediment in the water column, which will hold and transmit thermal heat longer and deeper, warming the water more so than normal during the spring months. Sediment impacts should taper off as Shitike Creek ends its peak flow period and enters the base flows of summer.

Waterfalls 2 Fire Summation of Soil Burn Severity		
Soil Burn Severity Classes	**Acres Within Burned Area**	**Percent of Waterfalls 2 Fire Perimeter**
Unburned	3,501	29%
Low	3,385	27%
Moderate	3,414	28%
High	1,957	16%
Total	12,257	100%

The moist, cool, deep, fertile soils of the Shitike Creek Watershed will aid immensely in the regeneration and establishment of post fire successional plant species. Providing stabilizing ground cover and fresh sprouts of riparian vegetation to shade and reduce thermal heat into Shitike Creek. This will lead to upstream temperatures and water clarity returning to normal during the second and third years post fire as the added root mass and stems filter and trap sediment and canopy cover returns blocking thermal heat from entering the stream. Fire is an essential part of eco-system services and the short-term reduction in water quality will in the long-term benefit aquatic and terrestrial resources within the Shitike Creek Watershed.

Photo was taken near the Harvey Lake Trailhead off the P-400 where Soil Burn Severity was high and the presence of hydrophobic soils was noted.

Landslip/ Landslides

Seven hundred and eighty acres of rock outcrop and rubbleland are within the fires perimeter. Some of these areas, although lacking in any soil depth or soil coverage, are still an important factor of concern for landslides of rock and large woody debris (landslip erosion). High intensity fires in areas of rock outcrops and rubble transmits heat further into the rock base, causing fracturing and destabilization which could lead to rock and woody debris fall events. One concern would be shallow landslides along the headwalls where gullies have been forming in the high soil burn severity and high tree mortality units. These landslides could fall into Shitike Creek channel and possibly obstruct or berm the channel, causing a diversion for waterflow. Several studies have shown that shallow landslides are more probable in burned areas after tree roots decay, which occurs 4-10 years after tree mortality. These mapping units are found along the very steep northwest and east facing canyon walls of the Shitike Creek Watershed and the eastern flanks of Mt. Jefferson.

Although, there are increased risks to water quality, concern for life and property at risk is nominal because landslips and rock falls would occur in the remote, hard to access roadless areas and rugged terrain of WSR. Therefore no stabilizing treatments of seeding or mulching will be implemented. Natural processes will be allowed to occur within these areas of the watershed. Treatments to be implemented such as storm patrol will greatly provide any insight to conditions occurring during storm events and mitigate potential damage through actions that will reduce impacts such as removing debris from culverts and bridges and insuring roads are free from falling debris and flooding. Other treatments such as hazardous road and trail signs alerting the public to post fire dangers will be highly beneficial.

Watershed Response

In 2007, the WSA Complex Fire, and in 2011, the High Cascades Complex Fire occurred in areas within and adjacent to the Waterfalls 2 fire and provide insight into likely hydrologic and

geomorphic responses of watersheds within the Waterfalls 2 Fire. The soil burn severity map shows areas where an increase in runoff is expected. This map reflects the expected degree of change in rainfall runoff for the first several years following the fire. On-the-ground field observations were also conducted to determine potential watershed response. Channel morphology related to transport and deposition processes were observed in the field and through LIDAR analysis and helicopter reconnaissance. Observations included source and depositional areas for sediment and debris.

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.

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 complex 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.

One common geomorphic response of burned slopes is the generation of debris flows which can be much more erosive and destructive than floods. Given the severity of the fire, the availability of unconsolidated materials on hillslopes, location in low order basins and the steep, dissected terrain, it is possible that large debris flows could be produced after the Waterfalls 2 Fire given an intense rainfall event. LIDAR analysis provides evidence of past and current (pre-fire) instability of the steep slope in the watershed. While there are many sources of sediment and debris from the upper watershed, the intermingling of broad based u-shaped floodplain meadows and riparian forests act as depositional areas for debris and sediment.

Whitewater River Watershed

Soil erosion and impacts to water quality within the Whitewater River segments of the fire's perimeter are not of a severe concern. The watershed did not experience high burn severity or tree mortality from the fire as it traversed over the edges of Shitike Creek Watershed. The areas where soil burn severity was moderate are located on the steep south-facing slopes of Whitewater River canyon. These areas are mainly comprised of rock outcrops where periodic

rock slides occur naturally. Threats to life and property are nominal due to the fact that these areas are located in roadless and rugged terrain.

Threat to Values at Risk

Value at Risk	Potential Threat	Level of Risk	Treatment	Specification Number
Bridges		Moderate	Remove hazardous debris	ES-3, ES-4, ES-6
Cultural Use Building	Flooding	Moderate	Install flow deflector	ES-5
Commercial Property	Flooding	Low	Storm Patrol/Warning	NA
Water Quality	Increased turbidity, temperature, sediment	Moderate to High	Storm Patrol/ Warning	NA

- The bridge crossing over Noisy Creek on the P-400 road provides access for land-use to tribal members and forest management. The bridge is a railroad car with wooden decking and armored banks. The bridge crossing could be compromised from increased stream flow and debris from upstream in the Noisy Creek drainage.
- The metal-sided building at Peters Pasture, which is used for Culture Camp, may be susceptible to damage from flood debris.
- The mill down in the town of Warm Springs near the mouth of Shitike Creek is located within the 100-year floodplain and may be susceptible to post-fire associated flooding within a 25-year event.

Water Quality

- There is heightened probability that during the upcoming two water years (October 2012(13)-May 2013(14)) there will be a reduction in water quality within Shitike Creek and Noisy Creek drainage as a result of short-term responses to wildland fire. There will be increased turbidity, suspended sediment, and organic debris in Shitike Creek, Whitewater River, and Noisy Creek. Shitike Creek may experience an increase in stream temperatures in the spring and summer.

Property and Infrastructure

- <u>Peter's Pasture area</u>
  A very large log jam spans the width of Shitike Creek approximately 1,000 feet upstream of the P-400 bridge crossing the stream, and upstream of and near to the Culture Camp structures on the south side of Shitike Creek. Evaluation of historic air photos show that this woody debris jam has grown significantly over the course of two decades. Capacity for high stream flows to be contained with the channel of Shitike Creek is greatly reduced by this log jam, and this condition will be exacerbated by added sediment and woody debris inputs in the stream as a result of the fire. Staff of Warm Springs Reservation identified this log jam to be of great value, despite the threats it may pose in worsening

the potential for flooding structures in the Peter's Pasture area.

- Structures and Infrastructure in the community of Warm Springs
  Structures, residences, the water treatment facility, and bridges in the town Warm Springs were assessed for risk of flooding during a 25-year peak flow event of stream discharge in Shitike Creek. Stream channel cross-sections were evaluated with the elevations of structures and infrastructure. Additionally, the 100-year floodplain inundation study for Warm Springs was reviewed. Our investigation showed that residences, bridges, and the water treatment facility lie outside of the maximum height of the mid-range of predicted post-fire peak flows in Shitike Creek. Structures within the lumber mill area are within the post-fire inundation zone of a modeled 25-year peak flow of Shitike Creek.

- Noisy Creek Bridge
  Much of the Noisy Creek drainage exhibited moderate and high soil burn severity. Surface runoff, peak flows, woody debris and sediment transport are all expected to increase, resulting in moderate potential for high flows and debris to result in severe erosion at the bridge crossing, potentially compromising the stability of the structure.

V. RECOMMENDATIONS

Based on the results of the above observations:

A. Emergency Stabilization – Fire Suppression Rehabilitation

No recommendation under this category.

B. Emergency Stabilization

Storm Patrol (ES-3)
There are several places at risk of inundation, debris deposition, flood damage and other post-fire related impacts from elevated stream flows carrying sediment and debris. This specification will identify areas needing debris removal or that have sustained damage from post-fire watershed effects.

Hazardous Debris Removal (ES-4)
This will involve removal of hazardous woody material and brush in Noisy and Shitike Creeks immediately and following high flow events. The purpose of the specification is to decrease risk and reduce potential damage to the bridges from future high flow events.

Structure Protection (ES-5)
Placement of log barrier/flow deflector in front of Peter's Pasture metal barn to minimize the effects of flooding and debris during high flow events. The purpose is to protect property from high stream flow events.

Noisy Creek P-400 Stream Crossing Protection: Armoring and Dip Construction (ES-6)
Enhance structural stability of Noisy Creek Bridge with bank armoring, road rocking and construction of an overflow dip to increase flow capacity.

Hazard/Safety Signs (ES-8)
Installation of flood warning signs, burned area warning signs, and public safety signs. These signs will warn the public of dangers on the road that have changed as a result of the fire. This will provide the public with the necessary information to be prepared for being in a post-fire environment.

C. Management – (Non Specification)

The Warm Springs Forest Products Industries (WSFPI) mill has the only structures determined at risk for flooding from a 25-year precipitation event. Due to the location of the structures within the 100-year floodplain already accepted risks to flooding and responsibilities therein (CTWS Flood Damage Prevention Ordinance 77), structure protection is not being recommended by the BAER Team. The mill should however, be notified in advanced if flooding is probable to relocate structures and minimize damage.

D. Monitoring– (Non Specification)

Weather forecasts, flood forecasts, and gauging data from the Shitike Creek Gauge near Warm Springs should be monitored regularly for advanced prediction of a 25-year precipitation event and likelihood of overbank flooding at the mill and/or Peter's Pasture.

Stream flow data should be analyzed from the gauging data for three to five years post-fire to assess hydrologic response of the Shitike Watershed. Photos of peak flow events should be taken to document watershed response, channel capacities, and impact of high flows to infrastructure.

Photo monitoring points should be established before and after in areas where treatments were implemented and at key sites to record visual changes from natural and treatment response to wildland fires within the fire's perimeter. Post fire and treatment implementation photos should be should be taken in late spring for three-five consecutive years and archived in a manner in which BNR staff has access. The implementation leader should arrange this task.

VI. CONSULTATIONS

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Doug Dunlap	CTWS, Forest Road Engineer
TJ Clifford	DOI National BAER Team, Hydrologist
Rich Pyzik	DOI National BAER Team, Hydrologist

VII. LITERATURE REVIEWED

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VEGETATION RESOURCE ASSESSMENT

- **Objectives**

- Evaluate and assess fire and suppression impacts to vegetative resources and identify values at risk associated with vegetative losses.
- Determine rehabilitation needs supported by specifications to aid in vegetative recovery and soil stabilization efforts.
- Provide management recommendations to assist in vegetative recovery, physical improvement repairs, species habitat protection, and rehabilitation.

- **Issues**

- Short and long-term fire impacts to plant communities and vegetative resources within the Waterfalls 2 Fire on the Warm Springs Reservation.

- Protection and enhancement of other resource values including site productivity, wildlife habitat, forage resources and watershed stability.
- Management strategies that provide for the natural recovery and re-vegetation of impacted areas.
- Identification and early detection of noxious weed spread into the fire areas.
- Monitoring of noxious weed spread into burn area and the use of approved noxious weed control measures.

- **Observations**

This report identifies and addresses potential and known impacts to vegetative resources within the Waterfalls 2 Fire on The Confederated Tribes of the Warm Springs Reservation of Oregon. Due to the considerable natural resource values of this area and the cultural and spiritual significance of this land to the Confederated Tribes of Warm Springs (CTWS), it is important to assess the short and long-term impacts that the fire will have on vegetation.

The burned area is comprised of commercial forest and conditional use lands encompassing one main fire perimeter within the Shitike and Noisy Creeks watershed. Most of the burned area consists of remote and relatively undisturbed wildlands that provide forage/cover for a variety of wildlife and ESA listed fisheries. Additional uses of the vegetative resource include timber harvest, cultural and medicinal plant collection, and recreation opportunities.

Findings and recommendations contained within this assessment are based upon information obtained from personal interviews with tribal and Bureau of Indian Affairs (BIA) staff, tribal members, literature research, and field reviews of the fire area.

Reconnaissance of impacted areas was conducted utilizing aerial and ground survey methods. This assessment will address the concerns expressed by tribal members, the resource

professionals and the general public for the future management of these lands. It will detail the known damage to vegetative resources, discuss vegetation needs and monitoring criteria, and outline management considerations for recovery of the vegetative resources.

A. Background

The Waterfalls 2 Fire was ignited on August 6, 2012 by a lightning strike and burned approximately 12,257 acres of mostly conditional use forest lands. Resource concerns expressed by the Warm Springs Tribes about the fire impacts include: vegetative loss and the short and long term impacts to site productivity and biodiversity, loss of wildlife habitat, noxious weed encroachment and accelerated soil deposition into associated rivers and streams and the resulting impacts to water quality. Additional resource management direction was obtained from the Integrated Resource Management Plan, 2012, Tribal Noxious Weed Management Plan, and the Tribal Comprehensive Plan.

Plant Communities:

Overstory and understory upland plant associations within the Waterfalls 2 Fire are listed for the fire boundary based on the NRCS Ecological Site Descriptions and *Plant Associations of the Commercial Forest of the Warm Springs Indian Reservation*. Plant communities are considered relatively intact due to the inaccessibility of the rugged terrain resulting in minimal disturbance from vehicle/ATV traffic, which is often responsible for introduction of noxious weeds and introduced species.

There are two major plant associations within the fire boundary of Shitike watershed. The northern portion of Shitike and Noisy Creek watershed is predominantly characterized by grand fir/oregon boxwood communities, while the southern boundary (No Name) is characterized by mountain hemlock, lodgepole pine and beargrass communities (refer to Plant Association map).

<u>Shitike and Noisy Creek (northern portion of watershed)</u>

Overstory: grand fir *(Abies grandis),* Douglas-fir (*Pseudotsuga menziesii*), ponderosa pine (*Pinus ponderosa*), western larch (*larix occidentalis*),

Shrubs: Oregon boxleaf *(Paxistima myrsinites*), snowbrush ceanothus (*Ceanothus velutinus*), chinkapin (*symbol:CACH*), snowberry *(Symphoricarpus duhan)*,

Riparian: willow (SALIX sp), rose (ROSA sp)

Forbs: starflower (TRLA2) and strawberry (FRAGA)

Grasses: pinegrass (CARU) and western fescue (FEOC)

<u>No Name (terrain south of Shitike Creek)</u>

Overstory: mountain hemlock *(Tsupa meretensiana),* lodgepole pine *(Pinus contorta*). Also*,* Douglas-fir (*Pseudotsuga menziesii*), Pacific silver fir *(Abies amabilis*), noble fir (*Abies procera*), white bark pine (*Pinus albicaulis*) and ponderosa pine (*Pinus ponderosa*)

Shrubs: pinemat manzanita *(Arctostaphylos nevadensis)*, big leaf huckleberry (*Vaccinium membranaceum*), chinkapin (*symbol:CACH*), Oregon boxleaf *(Paxistima myrsinites*), prince's pine (*Chimaphila pursh*)

Forbs: beargrass (*Xerophyullum tenax*)

Grasses: bottlebrush squirreltail (*Elymus elymoides*)

B. Reconnaissance Methodology and Results

From August 26 2012 through September 4, 2012 the Warm Springs BAER team conducted aerial and ground surveys to map vegetation losses, determine fire effects to vegetative species and ground-truth aerial reconnaissance data. Ground reconnaissance included traversing affected areas and recording observations on plant community types, species composition, soil burn severity and fire intensity, topographic features, noxious weed species, and suppression damage.

In order to better address resource issues and concerns, each major issue will be discussed separately. These issues, however, are intertwined and cannot be properly assessed separately. Management recommendations follow these issues to more succinctly address treatment actions and prescriptions.

1. Vegetation

Vegetation was impacted in varying degrees due to a mosaic of burn intensity and severity as a result of the dry fuel conditions, steep and rugged terrain, remoteness of the area and weather/wind patterns during the incident.

Vegetation resources were directly impacted by suppression tactics used to control the fire. Documented impacts to vegetation resulted from:

- Construction of dozer lines along previously closed road and trail systems, and on previously undisturbed sites.
- Creation of safety zones, helispots, staging areas, helibase, spike camps, vehicle turn arounds, log decks, parking and drop points in and around the fire perimeter.
- Removal of ladder fuels and hazard trees during line construction activities.
- Reduction of fuels and vegetation ahead of the fire-front by burnout operations.
- Pump placement along streambanks and crew impacts to riparian areas during suppression efforts.

Fire intensity, as reflected in tree mortality, was often high even within areas of moderate to low burn severity. However, based upon local fire effects research and field observations, it is anticipated that fire impacts to plant communities and vegetative resources in low to moderate burn severity areas will recover quickly with natural recovery processes expected to provide immediate and long-term site protection.

Significant recovery in the low intensity areas (3,635 acres = 30%) will occur within the first year as natural regeneration will begin with the first rains and effectively re-vegetate the sites within 1-3 years. Within the moderate burn intensity areas (4,163 acres = 34%) natural regeneration should provide significant vegetative cover within the next 3-5 years. High burn severity areas (4,459 acres = 36%) will recover more slowly and take 5-7 years to re-establish acceptable ground cover under natural regeneration processes. A majority of understory

vegetative cover was removed in the moderate and high burn severity areas along with a significant loss of tree canopy.

Fire intensity was high along the upper reaches of Shitike and Noisy Creeks. Emergency stabilization treatments, per the recommendations of the BAER Team, will not be included on the steep slopes associated with these riparian systems due to topographic challenges, the nature of the wilderness system and recharging benefits to bull trout populations (refer to Fisheries/Hydrology assessments). There was also concern that the sheer disturbance of implementing mulching/seeding treatments creates a substantial risk of introducing invasive species into an intact ecosystem.

Noxious Weeds

A search of noxious weed database revealed that noxious weed populations have not been located within the fire boundaries. However, diffuse knapweed *(Centaurea diffusa.),* spotted knapweed (*Centaurea maculosa*) and tansy ragwort (*Senecio jacobaea*) were noted during recent inventories along roadsides a few miles outside of the fire perimeter. These species are very aggressive and readily invade areas where the soil has been disturbed, posing a direct threat to native species re-establishment on disturbed sites.

Concerns were expressed by staff within the CTWS Range and Agriculture Program about the potential movement of noxious weeds into the fire areas by fire suppression vehicles. Dozers, engines, water tenders, graders, and 4-wheel drive vehicles from throughout the state of Oregon were used to suppress the fire on tribal lands. There is potential for weed transportation into the fire area by these vehicles from outside of the reservation as well as transport from the rangelands dominated by invasive annual grasses into the forested wilderness areas. A three year monitoring plan will be developed to ensure that weeds were not transported into, or around, the fire perimeter particularly on sites with heavy disturbance (refer to attached map of heavily disturbed locations).

Cultural Plants

Cultural plants of significant importance within the fire are huckleberry and beargrass. Because growth meristems of these species are below the soil surface they are generally protected from fire damage and are expected to recover quickly, particularly in low to moderate intensities. Both are rhizomatous and beargrass can often survive moderate to high fire intensities/severities and is generally the first plant to sprout in scorched areas. Native Americans traditionally burned huckleberry to maintain or enhance fruit production. Fire will additionally enhance these species due to reduced competition for sunlight and an increased availability of water and soil nutrients. No management recommendations will be incorporated for cultural plants.

- **Recommendations**

The following recommendations are offered to assist in the timely recovery of the Waterfalls 2 Fire area:

Management

- Dozer trails should be re-seeded with native seed mix that incorporates species following plant associations for the identified ecological site and in accordance with specifications outlined within the Operations Assessment of this plan.
- Provide information and educational opportunities for tribal members and staff on potential weed types, which may have been introduced into the area by fire suppression equipment and ground disturbance.

Monitoring

The following recommendations are offered to assist in the timely recovery of the reservation lands located within the Waterfalls2 Fire area:

- Monitor for new populations of tansy ragwort, knapweed species and invasive annual grasses on travel routes and within fire perimeters that may have been transported by fire equipment, vehicles and fire fighting personnel. Conduct walk-over surveys of disturbed sites including, drop points, spike camps, log decks and safety zones to identify new weed populations resulting from suppression actions. Conduct short-term baseline monitoring of all identified locations for 3 years for invasion of noxious weed species of concern. **(Noxious Weed Monitoring and Control Specifications)**.
- Thoroughly investigate, map, and control new noxious weed infestations as discovered.

<u>Management Recommendations (non-specification related)</u>

1. Develop public information brochures on vegetative recovery within the fire area. Encourage recreationalists to stay on established trails.
2. Develop a monitoring plan that documents methodologies and standards for sampling of fire effects, vegetative regeneration and the success of rehabilitation treatments. Plots should be established within the fire area to monitor recovery and natural regeneration processes.
3. Educate natural resource staff on potential weed species that may have been introduced into the fire area.
4. Immediately hire implementation coordinators to ensure timely application of treatments.

- Consultation

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FOREST RESOURCE ASSESSMENT

I. OBJECTIVES

- Identify and evaluate fire related impacts to forest vegetation.
- Determine rehabilitation needs supported by specifications.
- Provide management recommendations regarding forestry issues.

II. ISSUES

- Tree mortality and salvage of commercial forest products.
- Reestablishment of forest cover within severely burned areas.
- Long term effects on forest health.
- Loss of investments in reforestation and stand improvements.

III. OBSERVATIONS

This report addresses the impacts on forest resources of the Waterfalls 2 Fire. This report will also address suppression activities and proposed rehabilitation treatments on forest resources on the Warm Springs Reservation. Total area affected on reservation is 12,257 acres of which 11,200 are designated as forest (Table FR1).

1. Vegetation

The Waterfalls 2 Fire occurred within the east slope Cascade Range conifer forest at elevations ranging from approximately 3,600 to 6,600 feet. The overstories are composed of mainly mountain hemlock (*Tsuga mertensiana*), subalpine fir (*Abies lasiocarpa*), lodgepole pine (*Pinus contorta*), Douglas-fir (*Pseudotsuga menziesii*), western larch (Larix occidentalis), and ponderosa pine (*Pinus ponderosa*). Understory vegetation is composed of shrubs, sedges, grasses, and forbs. The primary shrub species are Oregon boxwood (*Pachistima myrsinites*), chinkapin (*Castanopsis chrysophylla*), and snowbrush ceanothus (*Ceanothus velutinus*), bigleaf huckleberry (Vaccinium membranaceum) and grouse whortleberry (Vaccinium scoparium).

Forest Types

Forest types within the fire perimeter were determined based on the Agency's current stand based inventory database and geographic information system (GIS) as well as field verifications to each fire. Major forest types within burn areas include:

- **Grand Fir:** The primary species in this forest type are Douglas-fir, ponderosa pine, western larch, and grand fir. Grand fir is the climax species. The understory shrub composition mainly consists of ceanothus, Oregon boxwood, and snowberry. Stand structures can vary from even-aged single species plantations to complex multi-storied canopies comprised of six to eight different conifer species. These forest types are highly productive relative to other forest types on the reservation.

Following disturbance, and particularly fire, ceanothus readily reestablishes in these forest types.

- **Western Hemlock/Silver Fir:** These forest types are composed of western hemlock, silver fir, noble fir, western white pine, and Douglas-fir**.** Understory grass and shrub component is made up of beargrass and bigleaf huckleberry. These forests receive high amounts of precipitation and have a relatively short growing season.

- **Lodgepole Pine/Mountain Hemlock:** Lodgepole pine dominates this forest type. Associated species include mountain hemlock, western white pine, pacific silver fir, western larch, Douglas-fir, and grand fir. Beargrass, bigleaf huckleberry, and Oregon boxwood are the primary understory shrubs and grasses. Over the last decade these forest have been impacted by mountain pine beetle. Most of the lodgepole pine component has died, resulting in significant standing dead and down fuels.

Acres Burned by Forest Type	
FOREST TYPE	**ACRES**
Grand Fir	5,598
Western Hemlock/Silver Fir	760
Lodgepole Pine/Mountain Hemlock	4,842
Non Forest (Rock/Meadow)	1,057
TOTAL:	**12,257**

2. Management Direction

The Warm Springs Reservation Integrated Resources Management Plan, 2012 includes the following management goals which are pertinent to the commercial forest lands within the fire area:

- Manage timber to optimize its growth and sustain the production of quality wood products in a manner consistent with the Tribal Integrated Resource Management Plan (IRMP) guidelines and economic efficiency.

- Maintain or enhance timber resources, while improving the ecological health of the entire watershed. Schedule the harvest of timber based on health and value.

- Manage the forest lands to protect culturally, archaeologically, and ecologically sensitive areas.

- Manage forested lands as described in the management zone listings that follow:

  Timber – Commercial timberland is managed for timber production. Livestock and wildlife forage production is also emphasized. Sensitive, threatened and endangered plant and animal species, and cultural resources are protected. Some protection is provided for deer, elk and non-game wildlife habitat, biological diversity, and water and aquatic resources.

  Wildlife – Management of vegetation for the benefit of deer and elk is emphasized. Timber harvest is permitted but timber management practices are directed toward the production of quality habitat for deer and elk.

  Riparian – Management emphasizes the protection of riparian ecosystems, water quality, aquatic habitat and other water dependent resources. Management activities are strictly regulated (Ordinance 80). Timber harvesting is prohibited in riparian A zones.

  Cultural Areas – Suitable areas are protected and managed for the production of cultural plants and foods.

  Recreation Sites – These sites are managed for developed and dispersed recreational opportunities.

The Warm Springs Reservation Integrated Resources Management Plan, 2012 includes the following management goals which are pertinent to the conditional use lands within the fire area:

- Protect or enhance each conditional use area's unique resource features, resources use and cultural values, allowing natural processes and systems to function.

- Maintain each conditional use area in a primitive state.

Of the 12,257 acres burned in the Waterfalls 2 Fire, 2,481 acres are in commercial forest and 9,776 acres in conditional use. Of the commercial forest acres, 9 are categorized as brush, grass, rock or water. Of the conditional use acres, 1,047 are categorized as brush, grass, rock or water (Table FR2).

Acres Burned by Land Use			
CATEGORY	**FORESTED ACRES**	**NON-FOREST ACRES**	**TOTAL**
Conditional Use	8,728	1,048	**9,776**
Commercial Forest	2,472	9	**2,481**
TOTAL:	**11,200**	**1,057**	**12,257**

3. Harvest and Silvicultural Treatment History

Timber harvesting has been an important management objective for areas in the commercial forest within the Waterfalls 2 Fire area. Over half of the area within the commercial forest was plantations from previous regeneration harvests ranging from 2 to 35 years old. The plantations on steep south-facing aspects sustained high mortality from the fire. Plantations in the basins or tops or ridges tended to have moderate to low mortality. The mature stands (non-plantations) in commercial forest had a mix of high, moderate and low mortality from the fire. Most of these stands have had selection harvest entries over the past several decades.

4. Tree Damage/Mortality

Numerous factors influence post-fire tree mortality, including: season the damage occurred, pre-fire tree vigor/site quality, extent of crown damage, extent of cambium damage, post-fire stand density/competition, and post-fire climatic conditions as well as large and fine root damage.

Season: Conifers are most susceptible to fire damage early in the growing season, because retention of sufficient green foliage is necessary to carry the tree through the remainder of the growing season and provide food reserves for the following year (Wagener 1961).

Tree Vigor/Site Quality: Younger, more vigorous trees on good sites have a better chance of survival than over mature trees on poor sites (Wagener, 1961).

Crown Damage: The amount of live crown remaining, as distinguished from green foliage, is the most important single factor in survival of fire-scorched ponderosa pine (Wagener, 1961). Green needle bases indicate that the surrounding parts of the crown are still alive; conversely, darkened needles and needles "frozen" in position in direction of fire-run are unmistakable indicators that surrounding crown is dead (Wagener, 1961). Minimum criteria for survival of vigorous ponderosa pine growing on a good site after a late (after August 1) fire with no or light cambium injury are 50 percent live crown and 10 percent green foliage (Wagener, 1961). The green foliage requirement increases to 15-25 percent for moderately vigorous trees, those growing on poor sites, or following a midseason (July) fire. For an early season (before July 1) fire the minimum green foliage requirement is estimated to be 35 percent (Wagener, 1961). Herman (1954) found that saw timber-size trees required a minimum of 60 percent viable crown for survival. In species with slender twigs and small terminal buds, as in Douglas-fir, foliage kill and bud and twig kill are approximately the same as that which will be present in succeeding years (Wagener, 1961). The minimum post-fire survival criteria for vigorous Douglas-fir growing on a good site following a late season (after August 1) fire with no or moderate cambium injury are 45 percent live crown and 35 percent green foliage (Wagener, 1961). For moderately vigorous trees, those growing on a poor site, or following a midseason (July) fire, minimum survival criteria are 50-55 percent live crown and 40-45 percent green

foliage (Wagener, 1961). Wade and Johansen (n.d.) recommend conducting post-fire damage surveys within 2-3 weeks after a fire, before scorched foliage falls. Harrington (1987) states that dead needles can be distinguished from living needles within one month of damage. Wagener (1961) cautions, however, that except for very early season fires, the crown condition the year following the fire is more important for survival than the condition shortly after the fire. According to Harrington (1987), most mortality has occurred by the third year post-fire.

Cambium Damage: Based on preliminary results, Ryan (1990) has reported that, in the absence of significant crown injury, most trees survive up to 25 percent basal girdling, whereas few survive more than 75 percent.

Post-Fire Stand Density/Competition: Potter and Foxx (1979) reported decreased recovery as stand density increased above 130 trees per acre. Another contributing factor cited for poor recovery was competition from seeded grass.

Post-Fire Climatic Conditions: While Potter and Foxx (1979) speculate that climatic regimes the first few years following a fire are particularly important in terms of recovery, Wagener (1961) counters that drought may not necessarily exacerbate scorch effects due to reduced competition and reduced transpirational moisture loss associated with crown reduction.

Fire-damaged pines are more susceptible to bark beetle attack for two or more years post-fire (Miller and Keen, 1960). Those trees with both heavy foliage scorching and moderate to severe cambium kill are especially vulnerable (Miller, 1929; Salman, 1934). Bark beetle infestations are more likely to occur the same season following late spring or early summer fires than late summer or fall fires (Miller and Keen, 1960). Major insect "pests" associated with ponderosa pine in Oregon are: western pine beetle (*Dendroctonus brevicomis*); mountain pine beetle (*D.ponderosae*); red turpentine beetle (*D. valens*); and, pine engraver beetle (*Ips* spp.). Of the above, western pine beetle is the most aggressive. Capable of three generations per year, the western pine beetle has three "flights" of emerging adults--spring, summer, and fall. The first emergence, or "flight" occurs late spring/early summer (May-June).

The major insect pest of Douglas-fir is the Douglas-fir beetle (*Dendroctonus pseudotsugae*), which only has one generation per year; with an April-June flight.

Dwarf mistletoe is a parasitic plant infecting ponderosa pine, the true firs and Douglas-fir throughout the fire area. Spruce budworm (*Choristoneura occidentalis*) and the fir engraver (*Scolytus ventralis*) bark beetle have been reported as pests affecting Douglas-fir and white fir in mixed conifer stands prior to the occurrence of the fire. Douglas-fir beetle (*Dedroctoris pseodosuga*) has had effects in the Douglas-fir as well as Ambrosia beetle (*Trypodendron lineatum*). Annosus root disease (*Heterobasdion annosum*) has been located in stands within the fire perimeter.

5. Forest Mortality

The BAER Forester mapped stand mortality utilizing helicopter and field reconnaissance (Table FR3). Percent mortality was categorized into one of three severity levels: low (<30 percent mortality), moderate (30-60 percent mortality), and high (>60 percent mortality). The minimum mapping unit size was 10 acres. Tree mortality was expected to occur if the percentage of green foliage relative to the total crown length was less than 50%. Another factor used to determine mortality was cambium damage. Mortality was expected to occur if cambium damage was greater than 75% for ponderosa pine and Douglas-fir. For western white pine, tree mortality is likely with 50% or greater cambium damage. True firs are most susceptible to mortality from cambium and root damage. Here, mortality was assessed as likely to occur if cambium damage was 35% or greater.

Stand replacement fire areas or high mortality/high fire intensity areas suffered nearly complete mortality on all fires. Mosaic burn areas or moderate mortality/moderate fire intensity areas experienced partial tree mortality occurring from individual trees to large groups of trees up to about 10 acres in size. Within low mortality/low fire intensity areas only few individual trees or small groups less than 2 acres were killed.

Additional tree mortality over the next few years will continue in stands rated as moderate and low mortality from the immediate effects of the fire. The expected mortality is a product of species composition, consumption of heavy fuels in proximity to trees causing both cambium and fine root damage, and the presence of secondary vectors.

Affected Acres by Mortality Class	
MORTALITY CLASS	**ACRES**
High	4,198
Moderate	3,638
Low	3,364
Non Forest	1,057
TOTAL:	**12,257**

6. Potential Salvage

The Potential Salvage Map indicates areas potentially available for salvage logging using ground-based and cable logging systems as discussed with the Agency's management staff. A map was developed using inventory data and aerial and ground reconnaissance by the BAER Forester. Areas included for potential salvage were determine by the following criteria: 1) area must be

accessible and operational by ground-based or cable logging systems, 2) must have a desirable species mix and enough volume to result in a positive return for the Tribes, and 3) the area was in the moderate or high tree mortality category. The second factor was determined primarily by timber type (Veg Label) as identified in the inventory. Veg Label is a timber typing that incorporates species, average size, and stocking.

Access to many of these areas is presently available but additional road construction may be necessary to access logging areas. Also, marking guidelines will greatly influence the amount of volume to be salvaged within partially burned stands. Decisions regarding which, areas are to be salvaged will be made through an interdisciplinary process with Tribal involvement, and in accordance with Integrated Resource Management Plan guidelines. The mapped areas are not intended to promote or set aside any areas for logging potential but rather are information gathered during initial reconnaissance.

Table FR4 indicates acreage by burn mortality of potential salvage that could be realized through ground-based skidding and cable logging systems. Regeneration harvests were selected in areas of high mortality, while selection salvage were chosen for areas of moderate mortality. Because pulpwood value is seriously degraded by blackened bark, the possibility of salvaging this material is unlikely. Market conditions will also likely affect what type and size of wood would be considered for removal through harvest operations. Sawlogs should be salvaged as quickly as possible to minimize losses due to decay and wood boring insects. This is particularly the case for white fir and Douglas-fir. Ponderosa pine is highly susceptible to both mountain pine beetle as well as western pine beetle and should be salvage logged as quickly as possible in order to capture the value before blue stain sets in and reduces the value to approximately 50 percent. Other factors that affect the amount of merchantable timber to harvest may include, but are not limited to: road building, additional defect and breakage during harvest operations, additional set aside acres other than mapped areas, market conditions, value at the time of harvest, merchantability specifications, equipment limitations, continued mortality, and fire defect and loss.

Acres of Potential Salvage by Harvest Type	
FIRE NAME	**ACRES**
Regeneration Harvest	992
Selection Harvest	1,506
TOTAL:	**2,498**

7. Re-establishment of Forest Cover

The Confederated Tribes of Warm Springs depend on their commercial forest base to provide revenues to support Tribal operations. In order to maintain their economy, all commercial acreage must be maintained in a healthy, stocked condition.

Reforestation will be required in the high mortality/high fire intensity areas to return the forest into a stocked and productive state, while improving the landscape mosaic and associated diversity in wildlife and vegetative species. Reestablishment of forest cover will also provide long term benefits to soil productivity, water quality, and various wildlife species.

Reforestation will also be required in the some of the partially burned plantations since seed sources are not in close proximity to these areas. Reforestation in low mortality/low fire intensity areas is not required. Natural regeneration in these areas is the most cost efficient method of tree establishment. Reforestation will also not be required in areas where selection salvage has occurred since adequate seed sources will provide for natural regeneration. There are four requirements for successful natural regeneration: a properly prepared seed bed, suitable growing conditions, an adequate seed source, and protection from damage and predation. These conditions generally exist in areas of the fire where stands were rated as low mortality.

The Reforestation Map shows areas where full or partial planting is required. Reforestation in these areas is necessary in order to replace native tree species lost in the fire event. Without prompt reforestation, these areas will likely remain in non-forest types such as grass, range, or brush lands for several decades or longer. Areas requiring full planting are stands that are proposed for regeneration salvage harvest or plantations that experienced high mortality. Areas requiring partial planting are plantations that were moderately burned. All partial planting plantations were field visited and it was determined on average that 50% of these areas would need planting. To determine the total number of acres requiring reforestation the partial planting areas were weighted by this factor and added to the full planting acres. Table FR5 shows the total number of acres recommended for artificial regeneration by fire.

Required Reforestation Acres	
PLANTING TYPE	**ACRES**
Full	702
Partial	174
TOTAL:	**876**

Plant associations where snowbrush ceanothus and chinkapin is a major seral

component, there will be significant competition for moisture and light during plantation establishment. Likewise, grasses may have a serious effect on seedling survival and growth, depending largely on grass density and rate of reestablishment. The timing of planting will have the greatest influence on success of establishment. It is recommended that necessary measures be taken to replant the sites as quickly as possible before vegetative competition is reestablished to the degree that intensive site preparation will be required. Based on past experience on the Warm Springs Reservation, it is expected that ten percent of the initial planting acres will not be successful and will require replanting. In addition, based on historic results of stocking surveys and professional experience, shade protection of seedlings on steep south-facing slopes will be required to ensure adequate seedling survival. All areas that have been designated for reforestation within the burned area perimeter that have south-facing slopes > 40% and no existing overstory shade will be require shade carding on the southwest side of newly planted seedlings. It was determined that shade cards would need to be installed on 55 acres of the proposed reforestation areas.

In stand replacement areas within riparian zones species such as willow, alder and aspen have been reduced from sections of drainages. They are expected to re-sprout and should re-vegetate the site again and promote bank stability.

8. Long Term Forest Health

There is some risk of increased bark beetle populations resulting from fire killed or weakened trees in the burned areas. Bark beetle infestations have resulted in the past following forest fires on the Reservation. Since the burned area in this fire was in the higher elevation plant associations the risk is relatively low. Mountain and western pine beetle invasions would be more common in drier ponderosa pine forest types. Also most of the lodgepole pine in the fire area has already died from previous mountain pine beetle attacks so the risk for those forest types in minimal. The areas where Douglas-fir and ponderosa pine exist may experience some bark beetle activity this fall and next year.

9. Loss of Forest Management Investments

Fire effects on long-term forest management investments are listed as follows:

CFI and Permanent Plots

There were 45 continuous forest inventory plots affected by the fire. Damaged plots will need to be visited to reestablish plot center, replace aluminum tree tags, record tree mortality and damage, and tag/paint reference trees as necessary. The estimated cost to relocate and reestablish the 1/5 acre CFI plots is $350.33 per plot.

Plantations

Plantation blocks totaling 553 acres incurred high and moderate mortality within the burn areas. These plantations ranged from 2 to 35 years old. Carrying the investments associated in establishing these plantations including seedling procurement, planting, plantation protection, and precommercial thinning over all these years has resulted in losses of over $550,000 assuming a 6% discount rate.

IV. RECOMMENDATIONS

Rehabilitation

1. Management

- Reforest approximately 876 acres of operational timber land at an estimated total cost of seedling procurement and labor is $247,872 over a three year period. Reforestation prescriptions will be developed and work accomplished by local Agency staff.

- Perform stocking surveys on the operational timber land for a three year period directly following planting at an estimated total cost of $5,256.

- Perform rodent trapping for a three year period directly following planting at an estimated total cost of $35,040.

- Install shade cards to protect newly planted seedlings on 55 acres of harsh planting sites at an estimated cost of $4,400.

- Reinstall 45 damaged CFI plots. The cost of reestablishing plot locations is estimated at $350.33 each per plot for a total cost of $15,765.

2. Monitoring

- Monitor success of reforestation 1, 2 & 3 years after planting to determine need for replanting and additional gopher trapping and identify needed release/protection treatments.

3. Management

- In accordance with management direction, harvest economically accessible areas immediately to salvage fire-killed timber. Approximately 2,498 acres have been identified for potential salvage operations.

- Monitor potential damage and loss of trees from long term fire effects and buildup of forest insect populations as well as hazard fuels. If necessary, fuels risk may warrant fuels funding request in the future.

Prepared by: Ryan Singleton, Silviculturist, Forestry Dept., CTWS, 541-553-8226

V. CONSULTATIONS

Bill Donaghu: Forester, retired BIA Forester Warm Springs Fire Management, CTWS
Vernon Wolf: Area Forester, Forestry Dept., CTWS
Rich Botto: Forest Planner, Forestry Dept., CTWS

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CULTURAL RESOURCE ASSESSMENT

I. OBJECTIVES

- Assess potential damage to cultural resources for the purpose of recommending treatments to stabilize and rehabilitate archaeological sites, cultural landscapes, traditional cultural properties and historic structures from adverse effects following wildland fire, suppression activities and rehabilitation projects.
- Conduct assessments and rehabilitation in conformance with Tribal Code 490, Ordinance 68 "Protection and Management of Archaeological, Historical and Cultural Resources."
- Conduct assessments as necessary to meet federal legal requirements under the federal laws, specifically the National Historic Preservation Act (NHPA), 35CFR 800, Protection of Historic Properties.

II. ISSUES

- Participation of the tribal cultural resource program in the identification of cultural resources affected by the Waterfall 2 Fire and in the development of rehabilitation plans sensitive to values and desired resource conditions;
- Investigation of previously documented cultural resources potentially affected by the Waterfall 2 Fire, by suppression actions, or by proposed rehabilitation activities;
- Investigation of undocumented cultural resources potentially affected by the fire, by fire suppression actions, or by proposed rehabilitation activities.

III. OBSERVATIONS

Background

A Natural Resources Advisor (Advisor), Vernon Wolf, assigned to the fire was provided maps and cultural resource information on August 20, 2012 from the Cultural Resources Program. No other documentation to indicate the nature, extent or condition of the resources was provided.

Cultural History

A 1984 Eastern Washington University (EWU) sample survey (Hartmann 1985) has summarized the most relevant cultural history of the Warm Springs Reservation, specifically in the timbered area for the Warm Springs Reservation. Though there have been several other reports describing the cultural overview of the reservation, the EWU report includes a broader view of the reservation and EWU included tribal members in an ethnographic process to better define the Tribes history on the landscape. A secondary report that focuses on the area south of the fire, but also provides a broad overview of the area, is the Metolius Wild and Scenic report (Oetting et al., 1992), this report also incorporated oral histories. For a more comprehensive background of the general

landscape and ethnographic data, please refer to the Hartmann (1985) and Oetting (1992) documents on file at the Warm Springs Geo Vision (WSGV) Cultural Resources Department (CRD).

There are six previous inventories that either were conducted adjacent or within the fire boundaries, these include: the Boulder Creek Timber Sale (Keeton 2003), the EWU sample survey (Hartmann 1985), the Whitewater and Sugar Pine 2008 Salvage (Hylton 2009), the South Cable Timber Sale Project CTWS-92-1 (Martin 1992), the Lookout Butte Timber sale (Gauthier 2007) and finally an inventory for a helicopter landing zone by Peter's Pasture (Stuemke and Muir 1995).

Previously documented cultural resources are commonly placed into three general categories: 1) pre-reservation (prior to 1855); 2) traditional use areas and sites, and Euro-American explorations, 3) reservation (post 1855), reservation surveys, allotment homesteads, and Civilian Conservation Corps (CCC) and the Indian Conservation Corps (ICC) which include buildings and projects that were conducted within the reservation. The first category includes the habitation and activity areas of Native American Indian groups who spoke a variety of languages: Kiksht or Upper Chinookan (Penutian phylum), Sahaptin, and Uto-Aztecan or Numic (Northern Paiute). These resources are known primarily through archaeological analyses of flaked and groundstone artifacts and habitation sites, as well as through oral histories/ethnographic inventories (James 1996).

The resources of the second category, traditional use areas and sites, are not easily identified. These include, in addition to archaeological sites, cultural food and plant fiber gathering areas, places of historical and cultural significance, as well as the cultural knowledge, which makes them significant. These places require local assistance in order to identify and assess them (Tribal Code 490, Ordinance 68 and Ordinance 74 and the NHPA). Such sites may or may not include archaeological remains, and therefore, may not be visible to an archaeologist, thus it is dependent on cultural resource managers to conduct ethnographic inventories of the local populace.

The third category is that of historically significant resources associated with the post-contact era. This includes early Euroamerican explorations and reservation surveys, as well as allotment homesteads, and CCC and ICC buildings and projects.

Historic properties are defined by the National Historic Preservation Act (NHPA) (36CFR800.16) includes prehistoric (precontact) or historic districts or sites, buildings, or objects included in or eligible for inclusion in the National Register of Historic Places (NRHP), this includes associated remains, records and artifacts. This definition includes those properties of religious and cultural importance to an Indian tribe; otherwise described as traditional cultural properties.

In 1989 the CTWSRO created, from their own tribal perspective, Tribal Code 490, Ordinance 68: *Protection and Management of Archaeological, Historical and Cultural Resources.* This document encourages the protection of historic properties by the utilization of federal and state cultural laws, where applicable.

For the purposes of this report a literature review was conducted within the CRD for cultural resource information pertinent to the affected areas. The Waterfalls 2 Fire BAER team has not established a specific Area of Potential Effect (APE) for cultural resources; however, the APE

should include all areas affected by the fire; burned areas, suppression activities, and staging areas in and outside of the direct fire line. The WSGV CRD has created a survey strategy of field reconnaissance and assessment, and protection for cultural resources has been formulated. The priorities for the field work are to conduct monitoring of all known historic properties that may be directly or indirectly affected by the fire; survey of all suppression activities, specifically dozer and hand lines, and survey of all staging areas associated with the fires. Data discussed below is based on known/previously-recorded sites within the burn unless otherwise stated.

Background

Waterfalls 2 Fire

The Waterfalls 2 Fire area is considered moderate to high probability for historic properties due to its close proximity to water, areas flat terrain and its cultural significance to the people of the CTWSRO; however, the area has areas where the slope is greater than 20 percent; within those areas the likelihood of historic properties goes down considerably. A large percentage of the area lies within the CTWSRO designated Conditional Use area. The Conditional Use areas have traditionally not been managed due a variety of reasons from low value timber, high logging cost due to the rough terrain and traditional cultural use values located within the area. Therefore, very little is known archaeologically within the fire area; and so, we have to rely on the studies gathered on adjacent lands and those lands just within the fire perimeter that lie within the commercial grounds to help identify the potential for sites. There have been six previous inventories within or adjacent to the Waterfalls 2 Fire area that encompassed portions of the burned area. Inventories include: four timber sales, one of which was a fire salvage; one proposed emergency helicopter landing zone; and the EWU sample survey of the commercial timbered lands. These surveys have identified three cultural properties adjacent to the Waterfall 2 Fire (See Table 1); no sites were identified within the fire perimeter. These include one historic trail (09-99-BL-017-03), a Civilian Conservation Corps (CCC) structure (H-12) with additional historic structures, and a small area identified as a possible portable lumber mill (01-SCBL-91) based on milled lumber and metal fragments.

Table: Known sites in close proximity to the Waterfalls 2 Fire

Tribal Site Number	T/R/S	Site Type	Indirect Affects (Burn)	Direct Affects (Suppression)
06-99-BL-017-03	9/9/ 15, 16, and 22	Historic Trail	No	No
01-SCBL-91	9/9/34	Historic Sawmill?	Unknown	Unknown
H-12	9/9/35	Peters Pasture CCC Spike Camp	No	No

Reconnaissance Methodology and Results:

Within the burn area the CTWSRO cultural resource methodology will be conducted where applicable. An archaeologist meeting the Secretary of Interior professional standards as outlined within the NHPA will conduct professional level cultural resource inventories based on current CTWSRO CRD standards, which meets or exceeds the Oregon State Historic Preservation Office standards. Inventories will include a survey of each hand line, dozer line, and staging areas (pumping, camps, etc.), all areas considered for rehabilitation and any potential site areas that are reported by fire crews not previously recorded. Areas considered for inventory will follow the high, medium, low probability established by the CTWSRO. Low probability (20 percent slope or greater) will be sample surveyed, at least 10 percent. Moderated probability areas (10-20 percent slope) will be sampled surveyed, at least 40 percent. A 10 percent or less slopes will be 100 percent inventoried.

The following technical recommendations should be considered:

- Assess actual and potential fire and rehabilitation effects on previously documented cultural resources;
- Inventory 100 percent of those areas determined to be high probability and disturbed by suppression efforts for cultural resources and provide summary documentation, as needed;
- Inventory up to 10 percent of the low probability and 40 percent of the moderate areas that will be rehabbed;
- Develop evaluation specifications for sites affected by the suppression activities of the fire;
- Survey lands affected by the fire not previously surveyed.

All previously known sites with potential for affects by suppression efforts will be monitored prior to rehab efforts. For those sites that are not relocated during the initial monitoring, it may be recommended that additional monitoring be conducted in fiscal year 2013.
Two previously recorded historic properties were identified during background research as being in close proximity to the Waterfalls 2 Fire (see Tables 1 for site data). Known historic resources identified include a historic trail and remnants of a historic portable saw mill. These sites appear to be within, or close proximity to, a staging area in and around the perimeter and in close proximity to a dozer line.

Findings

On August 26, 2012 Archaeologist/Cultural Resource Manager, Sally Bird, from the WSGV CRD, a solely owned and operated enterprise of the CTWSRO, was assigned to the BAER Team. On August 27, 2012 Sally Bird met with the other members of the BAER team and participated in a field training/reconnaissance trip to the Waterfalls 2 Fire area.
No archaeological fieldwork has been conducted on the Waterfalls 2 Fire at the time of writing this document. The BAER Team Leader, Vernon Wolf, checked on the historic trail (06-99-BL-

017-03) and determined that suppression activities (dozer line) did not impact the trail but that the dozer line was located approximately 20 feet off the trail. No additional assessments are needed for this resource.

A second previously recorded site, historic portable sawmill (01-SCBL-91) might be located within a staging area. This site, 01-SCBL-91, was originally recorded in 1991 (Martin 1992) as a scattering of rusted nails and cans with milled lumber; there was no specific evidence of a portable mill. The site was monitored in 2003 (Keeton) noting some of the same materials. The site should be monitored to determine if the burn or suppression activities affected the site.

The third resource, Peters Pasture CCC Spike Camp (H-12) was used as a staging area during fire suppression activities. On August 27, 2012 the BAER team visited the site area and noted no affects to the resources. Previously the CTWSRO Resource Advisors, Vernon Wolf and Ryan Singleton contacted the CRD for advise to ensure protection of the historic structures, both the CCC structure that is falling down due to natural formation processes, and a secondary structure that appears to be over 50 years old but not fully assessed. The result was to remove the vegetation immediately adjacent to the structures and provide a sprinkler system to the area. No further action was required.

At the time this plan was completed none of the dozer line and other suppression activities had been inventoried. Approximately 18 miles of dozer line are identified for the Waterfalls 2 Fire and require inventory.

The Noisy Creek Bridge will require some additional work as the bridge decking is failing. The decking will be replaced as well as an overflow dip constructed along the east approach with rock armory to off set overflow that may occur if there is a run off event. The area has been heavily disturbed over the years due to the 1996 flood event and the original bridge construction. It is the opinion of the CRD that no Section 106 inventory is required for this undertaking.

IV. RECOMMENDATIONS

Management

Cultural Resource monitoring should be conducted on historic property 01-SCBL-91 to determine if affected by fire or suppression activities. The site lacks integrity and an extensive literature review has not identified the presence of a portable sawmill within the area of the site (Lionshead Pond), therefore, it is not recommended for evaluation for eligibility to the NRHP.

Peter's Pasture CCC Spike Camp (H-12) should have a NHPA, Section 106 assessment. The site is eligible to the NRHP by its association with the CCC era. This assessment would include a more intensive level survey, which includes an intensive archival research. Furthermore, the additional structures located within the Peter's Pasture staging area appears to be historic and should have a reconnaissance level survey conducted by a historic archaeologist.

Due to the limited cultural resource field inventory and the upcoming impact the following management recommendations are suggested:

Complete inventory of the dozer line (approximately 18 miles), and all staging areas (safety zones, drop zones, helispots). These areas need to be examined to evaluate potential effects to cultural resources resulting from fire suppression and post-fire rehabilitation actions. Should cultural resources be identified near any of these areas, damage assessments must be prepared. Supplemental specifications for rehabilitation or mitigation of site damages may be submitted for BAER funding.

Assess known sites in the area impacted by fire prior to the onset of winter weather; this is to document the extent that suppression, rehabilitation, and fire effects have compromised the historic properties' integrity or caused significant loss or modification.

In the event that a salvage logging operation will be proposed within the APE, a cultural resource inventory should be conducted in accordance to the NHPA Section 106.

An oral historical study by the WSGV and Warm Springs elders on cultural plant gathering areas should be conducted. Portions of the Waterfalls 2 Fire area have been reported as historical and current-use areas for gathering of cultural plants, which include foods, medicines, teas, and fibers as well hunting and fishing activities. This may be a reasonable mitigation tool for those sites not relocated or lost due to the fire activities.

Dependent upon the results of the inventory of the high-probability areas recommendations for or against additional inventory of the dozer lines within moderate to low probability areas can be justified.

Conditional Use lands of medium-to-high probability areas affected by the fire activities should be archaeologically inventoried. The lands designated Conditional Use were selected for a variety of reasons, one of which is that the lands are considered sacred to the CTWSRO membership. In order to receive a full assessment of the area it is recommended that an oral history study be conducted within the affected area.

Dependent of whether or not sites are damaged or absent due to fire activities mitigation measures will need to be discussed. This may include testing and assessment for the NRHP. All cultural resource reports and assessments will be consistent with legal requirements and submitted to the Tribal Historic Preservation Officer for comment.

V. CONSULTATIONS

Sally Bird, Cultural Resources Department, WSGV	541-553-3555
Robert Brunoe, Tribal Historic Preservation Officer, CTWS	541-553-2002

REFERENCES

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WILDLIFE RESOURCE ASSESSMENT

I. OBJECTIVES

•Assess effects of fire and suppression actions to Threatened, Endangered, Proposed and other culturally significant agency listed species (TEPS) and their habitat.
•Initiate Emergency Section 7 Consultation as required by the Endangered Species Act with the United States Fish & Wildlife Service (USFWS), and National Oceanic Atmospheric Administration (NOAA).
•Determine effects of fire and suppression action to habitat improvements.
•Prescribe emergency rehabilitation measures and/or monitoring.
•Assess effects of proposed rehabilitation actions to TEPS species and their habitat.

II. ISSUES

•There is habitat for three Threatened species within the fire area.
•Several culturally significant species occur within the fire area or may be affected because their habitat is within the watershed.
•Potential impacts to these species from the fire and suppression activities.
•Potential impacts to these species from rehabilitation actions.

III. OBSERVATIONS

The purpose of this Burn Area Emergency Response (BAER) Wildlife Assessment is to document the effects of the fire, suppression activities, proposed rehabilitation work, and potential post fire flooding, to all federally listed, Threatened, Endangered, Proposed, and culturally significant or locally rare birds, mammals, amphibians, reptiles, fish, invertebrates, and their habitat, that may occur on the Confederated Tribes of the Warm Springs Reservation, Oregon (CTWS) lands.

This assessment also discusses information which is included in documentation of the Emergency Section 7 Consultation for this incident. Emergency Consultation was initiated, as required by the ESA, with USFWS and NOAA. The detailed consultation documentation is on file at the CTWS Department of Natural Resources Office.

This report addresses impacts of the Waterfalls 2 Fire which consists of one main fire perimeter. The fire was started by lightning the evening of August 6, 2012. It is located approximately 5 miles northeast of Mt. Jefferson, and 22 miles west of Warm Springs. Fire progression over the course of the fire started in the upper Shitike Creek drainage and spread into the Whitewater River drainage. This report also assesses the suppression activities and proposed rehabilitation work on the Confederated Tribes of the Warm Springs Reservation lands (CTWS) associated with the Waterfalls 2 Fire. Wildlife and fish addressed for this fire include all federally listed species from the current USFWS lists, and culturally significant or locally rare species as identified by the CTWS Tribal Fish and Wildlife Committee. The federally listed species are summer steelhead, bull trout, and northern spotted owl. Additional species addressed in this assessment include bald eagle, American peregrine falcon, deer, and elk. This assessment is

based on formal surveys for these species and/or suitable habitat inventories. Documents, inventory data, sighting records, habitat maps and other species specific information referenced in this report are on file at CTWS Department of Natural Resources.

A. Wildlife Background

The Waterfalls 2 Fire burned approximately 12,257 acres beginning August 6, 2012. Vegetation resources were impacted to different degrees as burn severity and tree mortality varied across the landscape. For a more detailed analysis on fire effects to habitat plant communities see vegetation and forest assessments within this document. Pushed by high winds, dry fuels, low humidities and high temperatures, the majority of the fire burned between August 14 and August 27.

Fire suppression actions that occurred on the Waterfalls 2 Fire included: burnout of approximately 895 acres, construction of 18 miles of dozer line (includes improvement of about 80 miles of existing road, construction of 20 miles of hand line and four safety zones, numerous streams and lakes used as water sources, clearing of vegetation for ten helispots and eighteen drop points.

Soils were impacted to varying degrees as burn intensity varied across the landscape. Approximately 1,961 acres (16%) with a high burn severity (defines effects to soils and hydrologic function); 3,064 acres (25%) burned with medium intensity resulting in moderate burn severity; 3,432 acres (28%) of the fire area burned in a mosaic pattern resulting in low burn severity; and 3,800 acres (31%) was unburned (reference Burn Severity Map in Appendix). The low severity fire resulted in removal of all or part of the duff layer, and little effect to the shrubs and trees. Much of the low to moderate burn severity areas still have 1,000 hour fuels remaining on the ground, and live tree canopies overhead. In other moderate burn severity areas, the fire completely burned patches of vegetation where all of the plant species were affected but effects to soils and hydrologic function remain moderate. A few areas burned in a mosaic pattern, leaving some islands of unburned or lightly burned vegetation. To better understand the effects on wildlife habitat, it is important to review the information found in the Waterfalls 2 Fire BAER Vegetation Assessment found in this document.

The fire area is at high elevations just east of the crest of the Cascade Mountain Range. The terrain is steep and rugged in Shitike Creek and Whitewater River with limited access. Elevation range within the fire area is from 3,600 to 6,600 feet (entire fire area). Plant communities within the Waterfalls 2 Fire area consists of mixed conifer/snowberry, mixed conifer/ceanothus, mountain hemlock/subalpine fir, silver fir/big huckleberry/beargrass, lodgepole pine, and grand fir/boxwood/elk sedge communities. Overstory vegetation is comprised primarily of Douglas fir, white fir, lodgepole pine, grand fir, some ponderosa pine, and scattered sugar pine. Understory communities are primarily composed of shrub and forb species. Grasses include beargrass, elk sedge, and sedges in disturbed areas. Other common species include rose, Oregon grape, strawberry, and bracken fern. Meadow complexes occur throughout the Shitike Creek and Whitewater River riparian areas. Scattered remnants of old growth vegetation occur within the

fire area. Approximately 55-135 inches of precipitation occur, primarily in the winter and mostly in the form of snow.

The vegetative resources on the Reservation provide habitat for a wide variety of wildlife species as well as cultural and medicinal plants for tribal members. Over 357 different species of fish, reptiles, amphibians, birds and mammals are known or expected to occur as endemic or introduced resident and migratory species. Diversity of wildlife habitats is primarily due to elevation changes, variable precipitation across the landscape, a variety of vegetation ecotones, and natural geological features creating a complex landscape of watersheds (Integrated Resources Management Plan, 2012). Land management zoning within the fire area includes Commercial Timber, Wildlife Management, and Conditional Use.

B. Reconnaissance Methodology and Results

Information used in this assessment is based on a review of relevant literature, recent species list of federally listed, proposed, candidate, and species of concern obtained from USFWS (8/16/2012), survey data from the Confederated Tribes of Warm Springs Department of Natural Resources (CTWS), consultation with USFWS and NOAA, personal communication with local experts, BIA, CTWS personnel, and field reconnaissance of the Waterfalls 2 Fire. Reconnaissance for this assessment included field reviews as a Resource Advisor during the Waterfalls 2 Fire, ground reviews of the fire on August 27 through 30 and a helicopter flight over the fire area on August 28, 2012. Emergency Section 7 Consultation was initiated on August 16, 2012 with USFWS by Andrea Karoglanian and with NOAA on August 29, 2012 by Scott Struhs, both with Confederated Tribes of Warm Springs Reservation. Burn intensity and tree mortality were mapped by the BAER forestry specialists to determine effects to the soils and vegetation resources. Habitat for the various species in the Waterfalls 2 Fire area were mapped using data collected during fire reconnaissance and pre-fire habitat maps.

1. BIOLOGICAL ASSESSMENT FOR FEDERALLY LISTED SPECIES

The purpose of this assessment is to discuss potential effects of the fire, suppression action and proposed emergency rehabilitation activities to federally listed species that occur within, adjacent to, or downstream from, the Waterfalls 2 Fire area. Effects to other wildlife species are not discussed. This assessment is not intended to definitively answer the many questions of effects to specific species which are inevitably raised during an incident such as the Waterfalls 2 Fire. The focus of this assessment is to determine only the potential for immediate, emergency actions, which may be necessary to prevent further impacts to listed species that occur on CTWS. Because most of the species discussed in this assessment have ranges or territories which extend beyond the fire area, it may be important to include information at a larger scale for any species which appears to be potentially significantly affected, crossing land ownership boundaries.

a. Bull Trout (*Salvelinus confluentus*): The U.S. Fish & Wildlife Service listed bull trout as a Threatened species under the Endangered Species Act of 1973 on June 10, 1998 (Federal Register Vol. 63, No. 111). The Waterfall 2 Fire affected the headwaters of Whitewater River and Shitike Creek. Both provide spawning and rearing habitat for bull trout.

Habitat requirements of bull trout include cold water (less than 10^{o}C for all life stages and 15^{o}C for adult migration), substrates with low amounts (less than 20%) of surface fine sediments (less than 6.0 mm in size) for spawning, shallow margins with accumulations of detritus, backwater areas, and side channels with large woody debris for rearing. Bull trout are resilient to natural disturbances in a watershed having acclimated to stochastic events over time. The concern would be the direct effects of fire suppression which would be an additive effect to the natural regime. This population has a strong adfluvial component that uses the Deschutes River and this would further buffer the total population from the immediate effects of the fire.

b. Summer Steelhead (*Oncorhynchus mykiss*): The National Marine Fisheries Service listed Mid-Columbia summer steelhead as a Threatened species under the Endangered Species Act of 1973 on March 25, 1999 (Federal Register Vol. 64, No. 57). Shitike Creek is the only summer steelhead stream that is adjacent to the Waterfalls 2 Fire. Shitike Creek is a primary producer of summer steelhead to the lower Deschutes Basin. Optimum water temperatures for summer steelhead spawning are 4^{0}-10^{0}C and egg incubation and rearing are between 10^{0} and 13^{0}C. Summer steelhead require substrates with low amounts (less than 20%) of surface fine sediments (less than 6.0 mm in size) for spawning, shallow margins with accumulations of detritus, backwater areas, and side channels with large woody debris for rearing. Bull trout are resilient to natural disturbances in a watershed having acclimated to stochastic events over time. The concern would be the direct effects of fire suppression which would be an additive effect to the natural regime. This population has a strong adfluvial component that uses the Deschutes River and this would further buffer the total population from the immediate effects of the fire.

Below are the direct and indirect effects of the Waterfall 2 Fire that are common to both species.

Direct effects: There were two possible direct effects from the fire suppression activities on steelhead and bull trout populations. These direct effects include the following: 1) drafting of water from Shitike Creek and the Whitewater River, 2) high amounts of sediment potentially being deposited into intermittent stream channels from heavy vehicle traffic on the roads in close proximity to streams. Measures were implemented to minimize direct effects to these populations and their habitats. These measures included:

- Wrapping wire mesh screen material around volume pump foot valves that had inadequate screen size
- Applying water for dust abatement on the highly traveled roads.
- Placing pumps into spill containment pans and having the proper spill containment measures such as petroleum spill kits

- At water withdrawal sites on Shitike Creek and Whitewater River, weed free straw bales and silt fence were placed to dissipate water coming from the water tenders

- Treating the water tanks from all engines or water tenders with dish detergent at a ratio of 0.05 oz. detergent to 128 oz. of residual water in the tanks. This was done to prevent fish pathogens or invasive aquatic species being introduced into the watersheds.

Indirect effects: The fire intensity in the Shitike Creek watershed had both mixed fire intensity and severity with roughly equal portions of low, moderate and high. Approximately 5.8 stream miles of riparian corridor were severely burned and 18.1 miles that are low to moderate. Initial sediment delivery to the stream may be increased, but overall detriment to bull trout habitat would be minimal. The majority of the area has a low potential for increased sedimentation and short term water quality/chemical changes to Shitike Creek from heavy rainfall events because of the filtering capacity of the riparian vegetation along Shitike Creek and its tributaries and the soil types are gravelly to stony.

Effects Determination: **May affect, not likely to adversely affect**

c. Northern Spotted Owl (*Strix occidentalis caurina*): The USFWS listed the NSO as a Threatened species under the ESA of 1973 on January 15, 1992 (Federal Register Vol. 57, No. 10). The following information is based on the habitat maps, sighting data (1991 to present), the Revised Recovery Plan for the NSO (*Strix occidentalis caurina*), field observations, and conversations with CTWS Department of Natural Resources personnel and local experts. All suitable NSO habitats within the fire area have been previously surveyed since 1991 following and exceeding the USFWS protocols (3/12/91, as modified). However, due to federal funding cuts from the BIA there were not surveys conducted in the conditional use areas in 2007, 2008 and 2009. There are twelve historical activity centers found within 1.2 miles of the Waterfalls 2 Fire perimeter potentially affected by fire that have been surveyed to protocol since 2010 (see T & E map). Of the twelve previously occupied sites; several are now occupied by barred owls or have been unoccupied by NSO's for the past three or more years and are considered inactive (98526, 9931W, 9931E, 9932, 9934, 1096, 9919, 108513, 98513, and 10920). There are only two cores still active; 10908 and 10919 (Pers. Comm. Rick Gerhardt-Sage Science Inc., and Northern Spotted Owl Monitoring and Research Reports 1997-2012). Core 10918 near whitewater meadows has had a single bird detected within the last couple of years. Core 10919 in Milk Creek has also had a single bird in the last couple of years; however, no birds were detected in 2012. Core 108513 has been inactive for a number of years; no spotted owls have been detected within the last three years. There are no active cores within the fire perimeter. In the Shitike Creek drainage, a pair of spotted owls was detected in core 98526 in 2009 but there have been no detections since. The last detection in core 9931W was a pair of owls detected in 2007. Core 9931E last had a nesting pair of owls in 2008; however no birds have been detected since. Core 1096 had a single bird detected in 2006. Barred owls have been detected in core 9919 since 2000 with no spotted owl detections. Cores 9932 and 9934 have not had any spotted owl detections since 1999 and 1998, respectively. Core 98513 by Boulder Lake has not had a response since the

last pair nested in 2004. In addition, there is one other activity center further than 1.2 miles from the Waterfalls 2 Fire perimeter (10912) that may have been potentially affected by disturbance from the fire suppression and emergency rehabilitation and stabilization. There is the potential that aerial activity during fire suppression, particularly aerial actions, may have displaced individuals present within nearby suitable habitat. There is no Critical Habitat designated within the Warm Springs Indian Reservation.

Direct effects: The Waterfalls 2 Fire burned over approximately 6,170 acres of suitable spotted owl habitat within the fire area. Of which 2,094 acres were converted to non suitable owl habitat, and 4,076 acres were converted to degraded habitat. Of the total acres affected within the fire perimeter, approximately 590 acres were directly affected by burnout operations near Peter's Pasture. Of these 590 acres 51 acres were converted to unsuitable habitat and 538 acres were converted to degraded habitat. There were direct effects to suitable owl habitat within eight inactive nesting cores (98526, 9931W, 9931E, 9932, 9934, 1096, 9919, 108513) due to fire effects and or suppression activity. One active core (10918) had direct effects within the 0.5-mile radius surrounding the nest core due to fire behavior and/or suppression activity. One active core (10919) in addition to the previously mentioned had direct effects within the 1.2-mile radius surrounding the nest core due to fire behavior and/suppression activity. Both active nesting territories where the conversion or degrading of suitable nesting, foraging and roosting habitat to non-suitable or degraded habitat within the 1.2 mile radius surrounding the nest cores were affected to varying degrees (see Tables 1 and 2). This analysis was based on fire effects using timber mortality only within this plan and does not assess the effects of possible timber salvage due to the outcome of the fire.

Summary of fire and suppression effects to habitat for Northern Spotted Owl Core S10918-10.

	NEST CORE	0.5 MILE RADIUS	1.2 MILE RADIUS
POTENTIAL ACRES OF HABITAT AVAILABLE	76	503	2895
PRE-FIRE SUITABLE HABITAT	72	376	1330
POST-FIRE SUITABLE HABITAT	72	328	1259
POST-FIRE DEGRADED HABITAT	0	48	62
HABITAT LOST DUE TO SUPPRESSION	0	0	0
PERCENT OF POTENTIAL SUITABLE HABITAT REMAINING POST FIRE	100%	87%	95%

Summary of fire and suppression effects to habitat for Northern Spotted Owl Core S10919-10.

CORE# 10919	NEST CORE	0.5 MILE RADIUS	1.2 MILE RADIUS
POTENTIAL ACRES OF HABITAT AVAILABLE	72	503	2895
PRE-FIRE SUITABLE HABITAT	72	260	973
POST-FIRE SUITABLE HABITAT	72	260	946
POST-FIRE DEGRADED HABITAT	0	0	28
HABITAT LOST DUE TO SUPPRESSION	0	0	0
PERCENT OF POTENTIAL SUITABLE HABITAT REMAINING POST FIRE	100%	100%	97%

Indirect effects: NSO prey species on the Warm Springs Indian Reservation include small mammals such as flying squirrels, voles, woodrats and snowshoe hares (Prey Study-Sage Science Inc., 1995-97). Most of the fire burned with medium to low fire intensity (see burn severity map) which left ample habitat for prey species. Even though much of the fire killed large stands of trees (see burn mortality map), the mosaic pattern created by the fire will help regeneration of vegetation as well as species recolonization. Habitat for the prey species will return in time, depending on post fire revegetation rates. Repopulation of prey species into areas that were burned from moderate to low burn severity should occur relatively quickly as source populations still exist within the fire area that burned with low severity or did not burn at all. Also, immigration of prey species from outside the burned area should occur, as habitat becomes suitable. The use of this habitat for dispersal by young owls and as a connectivity corridor between NSOs and surrounding territories of the fire area will be limited for approximately 80 years. It is possible that this effect will be minimized by the use of remaining suitable habitat surrounding the fire area. Given the lack of recent owl occupancy to some of the existing territories and poor nesting success this season, there might have been some indirect effects to the NSO, but not likely to individual owls due to the fire, suppression activities, or emergency rehabilitation and stabilization. However, there may have been some disturbance due to equipment operation such as dozers, graders, helicopters, etc., but the proximity of most of this activity was far enough away from actual know nest trees and adults would likely move away from such disturbance.

Effects Determination: **May affect, likely to adversely affect**

2. OTHER SPECIES

All species of wildlife are important to the Tribes from an ecological standpoint, but some species have a greater importance because of their cultural significance to the membership. These species are addressed because of their importance to Tribal members for subsistence as well as cultural foods. Hunting, fishing, gathering and observation of these animals are important to the livelihood as well as cultural and traditional values of the Warm Springs, Wasco and Paiute people. Hunting, fishing and gathering is limited to Tribal members only. Information for this portion of the assessment is from the Integrated Resources Management Plan for the Forested Area and Rangelands, twenty plus years of big game population monitoring and research by CTWS wildlife departmental staff, historical records and many years of communications with tribal members.

a. Deer: Mule deer and black-tailed deer inhabit most areas of the CTWS Reservation. Both sub-species commonly interbreed and produce quality deer for subsistence, as well as cultural and religious ceremonies. Population sizes have varied over the years, with the most recent decline since 2000. The 1970s to mid 1980s also showed a decline in the deer population attributed to over-hunting, habitat loss, and unrestricted road access. Since 1984 the deer harvest on the reservation has been limited to regulated seasons and bag limits approved by the Tribal Council, Fish & Wildlife Committee, Tribal hunter's public meetings, and Department of Natural Resources staff recommendations. The deer herds on the reservation since adoption of regulated hunting seasons have experienced a gradual increase over the initial 15 years, but have showed a decline in the last 12 years, and are far below the carrying capacity of available habitat. The Waterfalls 2 Fire area is considered to be prime summer range for deer herds.

Direct effects: It is possible that mortality to deer occurred during the fire if the animals were unable to outrun advancing flames. No carcasses were found or reported within the fire area, and typically large mammals are able to outrun advancing flames.

Indirect effects: The Waterfalls 2 Fire affected big game habitat by converting approximately 3,749 acres of canopy cover to new seral stage openings due to high tree mortality, and reducing the cover quality on 6,987 acres to moderate to low tree mortality areas. Prior to the fire the Waterfalls 2 area had an estimated 6,167 acres (50%) of optimal thermal cover. After the fire there is an estimated 2,082 acres (17%) of the area left in optimal thermal cover within the fire perimeter. Near optimal thermal cover was also reduced by approximately 855 acres leaving 225 acres (2%) remaining in the burn area. There was an increase of marginal habitat cover of 935 acres leaving 3,050 acres (25%) of the marginal habitat cover within the burn area after post fire conditions. Therefore approximately 5,357 acres (44%) of the Waterfalls 2 burn area retains some characteristics of canopy cover attributes for big game. Hiding cover increased by 3,240 acres (27%). Forage openings also increased by 3,749 acres (31%). Total acres impacted by the fire are displayed in Table 3 below. There should be minimal indirect effects to deer other than temporary displacement of individuals due to the fire effects and suppression activities. Conversion of approximately 3,749 acres of cover habitat to openings will result in the indirect effect of deer utilization as foraging habitat for the next 10-30 years. However, it is expected that ceanothus and other shrub species will resprout quickly and will provide some hiding cover as well as browse within the next 10 years. Many roads and dozer-lines within the fire area were opened to increase suppression action effectiveness. If left open, the habitat for deer as well as other big game species will be further degraded due to increased access and disturbance reducing

the habitat effectiveness of the area. Cover habitat adjacent to the fire area as well as the remaining acres of mosaic cover not consumed by the fire will play a critical role in big game utilization of the burn area as well as transportation access to the area. This assessment does not address additional or cumulative impacts associated with salvage of the burn area or programmed timber harvest affecting suitable habitat.

FIRE OBSERVATIONS: Reports of deer and tracks observed within fire area during the incident.

Vegetation canopy cover impacted by the Waterfalls 2 Fire and Peter's Pasture suppression activities before and (after) burn.

Waterfalls 2 Fire	Optimal thermal (>70%)	Near Optimal (60-70%)	Marginal (30-59%)	Hiding (0-29%)	Forage openings (0 %)
Pre fire	6,167	1,080	2,115	1,374	1,514
Post fire	2,082 acres	225 acres	3,050 acres	4,614 acres	5,263 acres

b. Elk: Roosevelt and Rocky Mountain elk utilize most of the forested areas of the reservation. Tribal members hunt elk primarily for subsistence. Elk populations have increased steadily over the past 40 years. Optimal thermal cover for elk habitat on the reservation is declining, and high road densities affect much of the remaining habitat. Regardless of the reduced habitat effectiveness, the population has expanded over the past several decades. The Waterfalls 2 Fire area is considered to be an important summer and fall rutting area for elk with cows coming from as far away as Black Butte to reproduce with the bulls on the reservation (Metolius Elk Monitoring Project--ODFW tech report # 90-4).

Direct effects: Direct effects to elk in the burn area would be similar to deer; primarily temporary displacement due to fire effects, suppression activities, and habitat alteration to the vegetation because of the fire (see previous cover habitat analysis in deer section and the vegetation section in this report).

Indirect effects: The effects on elk in the fire area will be greater than deer since this area has been a critical breeding zone for elk for a long time. The only appreciable difference due to the fire would be the patch size of the remaining cover. Elk are a much more gregarious species than deer and since they are also much larger in size, they require larger patches of cover for diurnal bedding and security during the rut. The habitat attributes which contributed to thermal and hiding cover will take longer to recover for elk than for deer and will be lost for approximately 15-40 years. Loss of this habitat may cause increased interspecific competition for remaining resources. The habitat conditions after the fire in regards to elk will be predominantly used as a foraging area and should resprout in grass/ forbs favored by elk as early as next spring. Foraging habitat within the fire area should be improved. Elk also are less tolerant of human activities associated with motor vehicles and open road densities, particularly in key sensitive habitat such as Biddle Pass, Whitewater Conditional Use, Lionshead, along the Whitewater

River drainages (Elk Distribution and Modeling in Relationship to Roads- Rowland et al). Many roads within the fire area were opened to increase suppression action effectiveness. If left open, the habitat will be further degraded due to increased access and disturbance in the fire area. Road density objectives for the conditional use area in which much of the fire burned are no more than 1 mile per section and no more than 2 miles of open roads per section average within the wildlife management zones for the updated Integrated Resource Management Plan, 2012. New dozer lines as well as reopening previously closed roads will provide additional motor vehicle access to the area causing the habitat effectiveness for elk to become reduced. As with deer, this report does not address the obligatory impacts associated with salvage or the cumulative impacts from other timber sales.

FIRE OBSERVATIONS: Reports of elk tracks observed within fire area during the incident.

c. Bald Eagle (*Haliaeetus leucocephalus*): The USFWS listed the bald eagle as an Endangered species in 1967 and reclassified as a Threatened species under the Endangered Species Act of 1973 on July 12, 1995 (Federal Register Vol. 60, No. 133) and proposed for de-listing on July 6, 1999 (Federal Register Vol. 64, No. 128). Bald eagles were officially delisted on August 8th 2007 (Federal Register Vol. 72, No. 130). In Oregon, nesting habitat is found in all forest types bordering coastal, lake or river areas. Nest trees are usually large, open branching trees that are dominant on the landscape and are usually located within a half mile of water. In Oregon, bald eagle generally select forested stands with dense, high basal areas in locations with minimal logging or other human disturbance.

Several fish-bearing lakes occur just outside of the Waterfalls 2 Fire perimeter that contain bald eagle foraging habitat; including but not limited to, Harvey Lake, There are no known documented nesting pair of bald eagles near the Waterfalls 2 Fire area; however bald eagles are periodically detected within this area, including observations that occurred during fire suppression efforts.

Direct effects: There were no direct effects to any known bald eagle nest territories. There is the potential that smoke and flames displaced eagles, especially during heavy inversions. In addition, if any bald eagles were present within the vicinity of water sources and air space used by numerous helicopters and air tankers, especially near the helispots and dip sites, they may have experienced displacement caused by the increased noise and activity. Any of the displacement caused by the fire or suppression actions are expected to be temporary, therefore there should be no substantial direct effects to bald eagles.

Indirect effects: There were no known documented bald eagle nesting or communal roosting habitats that were affected by the fire. Fire effects to the perch tree habitat within the fire area vary throughout the stands. The fire killed many potential perch trees, causing them to eventually topple if they have not done so already, thus negatively affecting this habitat component. However, the fire also created some higher quality perch trees by opening up the canopy and creating sound snags with open branches that usually provide good perch tree structure.

Effects to bald eagle habitat include removal of many potential perch trees that posed a hazard to firefighters and public safety during suppression and rehabilitation efforts. Emergency

rehabilitation measures recommended in this report (listed below) should have beneficial effects to bald eagles because they include actions to prevent soil loss, protect fisheries and water quality, and to revegetate the fire area.

To summarize, the number of perch trees killed by the fire or felled as hazards represents only a small portion of the total trees available to bald eagles in the Waterfalls 2 Fire and adjacent areas. Although the total habitat acreage available for bald eagles is not mapped, it is estimated to be several thousand acres in size.

FIRE OBSERVATIONS: An adult bald eagle was observed flying downstream Shitike Creek during an aerial flight on August 28, 2012.

d. Peregrine Falcon (*Falco peregrinus anatum*): The USFWS delisted the American peregrine falcon as an Endangered species under ESA on August 25, 1999 (Federal Register Vol. 64, No. 164). One known eyrie is located in the Waterfalls 2 Fire area in the Whitewater River drainage near Lionshead Butte. This nesting territory has not been surveyed in the last two years, however incidental sightings have confirmed the territory is still occupied by peregrines.

Direct effects: Although the last known nesting territory is within the Waterfalls 2 Fire perimeter it was determined that there were minimal direct effects to individual peregrines. The fire activity was during the post fledging time period thus the adults and juveniles would have been able to move to nearby suitable habitat. Disturbance from the fire and suppression activities should be temporary and this site should be monitored for at least the next breeding season to determine occupancy and breeding success.

Indirect effects: The known eyrie located within the fire area near Lionshead, may have been affected by smoke created by the fire and helicopter flights during suppression activities. Potential peregrine foraging habitat within the fire area was modified. Prey species include a variety of birds. These prey species have probably been affected in two ways: direct mortality or displacement due to the fire and suppression action disturbance, and habitat loss. These effects, although significant within the fire area, should not greatly reduce the ability of the peregrines to successfully forage within a reasonable distance of their territories. This was a small fire relative to the foraging range of peregrines. Also, because portions of the fire burned in a mosaic pattern, leaving some unburned and minimally effected areas, and because there is suitable foraging habitat adjacent to the fire area, the prey species should still be available. Habitat for the prey species will return in time, depending on post fire revegetation rates. Avifaunal studies conducted after the 1977 La Mesa Fire in Los Alamos, New Mexico indicated that many bird species benefited from tree mortality, as indicated by increased species richness and diversity within the fire area (Johnson and Wauer, 1984). Since the fire occurred after the post-fledgling period the American peregrine falcon may be affected by temporary displacement of prey species due to the fire as a result of suppression activities.

e. Marten, Wolverine, Coyote, Cougar, Bobcat, Bear, Beaver, River Otter, Long-ailed Weasel, Short-tailed Weasel, Mink: All of these mammals may be found within the fire area for all or part of their life cycles. Denning habitat includes cliffs, caves, rock piles, talus slopes,

riparian areas, downed logs, large tree snags and stumps. Food items include other mammals, small birds, fish, shell fish, reptiles, amphibians and vegetation.

Direct Effects: Depending on the mobility of the animal, most of these species could avoid the direct effects of the fire by fleeing or taking shelter. Based on the time of year, it is expected that most of the young would be fairly mobile or able to hide from the fire. Hiding locations were close to the surface or in an area that burned with high fire intensity, mortality could have occurred due to heat and/or asphyxiation. Availability of riparian vegetation would be critically important for those animals associated with water and riparian habitat. Because most of the riparian vegetation remained unburned, direct effects from fire to those riparian dependent species should be minimal. Suppression actions (dozer and hand line construction) did little damage to riparian habitat. For those species not associated with riparian habitat, disturbance from suppression actions may have caused further displacement.

Indirect effects: Breeding habitat within the fire area may have been modified to some extent, particularly for those species with den sites associated with conifer forest. Availability of food will vary by species and is similar to that discussed in the other species sections of this assessment.

POST FIRE OBSERVATIONS: Numerous bear sign and sightings were reported throughout the fire and adjacent areas.

f. Raptors including Golden Eagle, Red Tailed Hawk, and Osprey: All of these species have been reported within the fire area. Nesting and/or foraging habitat for all of these species occurs throughout the fire.

Direct effects: No direct fire effects are expected as it is thought that young adult would have fledged and these birds should have been able to fly out of the fire area. Suppression actions, including helicopter flights throughout the area, probably caused disturbance and temporary displacement.

Indirect effects: Nesting habitat for these species may have been modified, particularly where entire conifer stands were destroyed by the fire throughout much of the fire area. Nesting habitat for some of these species may be a limiting factor in the future, causing displacement of some of the birds into adjacent or less suitable habitat, and/or failure to nest.

Prey species include small mammals, birds and carrion. The areas which were burned by highly intense fire will probably be unsuitable for many small mammal species for the next 2-5 years. This effect will be minimized because unburned pockets of habitats, and unburned pockets of vegetation within the fire area will provide habitat for animals to repopulate the burned areas as vegetation recovers. This repopulation will also occur from unaffected habitat surrounding the fire area. Bird prey species have probably been affected in two ways: Direct mortality or displacement may be caused by the fire, suppression actions, disturbance and habitat loss. These effects, although significant within the fire area, should not greatly reduce the ability of these raptors to successfully forage within a reasonable distance of their territories. Also, because portions of the fire burned in a mosaic pattern, leaving some unburned and minimally affected

areas, and because there is suitable foraging habitat adjacent to the fire area, the prey species should still be available, although reduced in numbers. Habitat for the prey species will return in time, depending on post fire revegetation rates.

POST FIRE OBSERVATIONS: Many raptors were observed during the post fire reconnaissance.

g. Ruffed Grouse and Blue Grouse: Habitat for these species is found throughout the fire area. These species are important for hunting and as prey items for other wildlife.
Direct effects: It is possible that these species would not have been able to escape the flames during periods of extreme, fast moving fire behavior. Temporary displacement from suitable habitat may have caused greater vulnerability to predation during the primary suppression period (8/14 – 9/2).

Indirect effects: Loss of nesting and hiding cover occurred over much of the fire area. Habitat within the areas which burned with high fire intensity will be unavailable until sprouting and regrowth occur. There should be minimal nesting habitat available by the next breeding season. Habitat used for hiding and thermal cover will be shifted to marginally suitable areas for the next fall, winter and spring seasons (slash piles, rocks, etc.) Some birds may move out of the fire area.

4. WILDLIFE HABITAT IMPROVEMENTS WITHIN THE FIRE AREA

IV. RECOMMENDATIONS

A. Management:

1. CTWS resource staff should continue Section 7 Consultation with USFWS and NOAA if necessary on fire effects, suppression activities, rehabilitation actions, and any future timber salvage as a result of the fire. See "Waterfalls 2 Consultation with USFWS & NOAA" documentation.

DETERMINATION: While it is the responsibility of the USFWS and NOAA to issue a biological opinion on the effects of this fire, suppression actions and proposed rehabilitation activities on Summer Steelhead, Bull Trout, and Northern Spotted Owl, the previous determinations located in the assessment section of this document seems appropriate.

Rehabilitation efforts described in this BAER Plan are not likely to adversely affect any TEPS species. Proposed emergency rehabilitation actions include: Rehabilitation of 20 miles of handline and 18 miles of dozer line, regrading of roads, reblocking roads, rehabilitation of helispots, drop points, and safety zones, and 876 reforestation acres for tree planting.

The potential effects of management actions subsequent to emergency fire rehabilitation, such as salvage logging, are not addressed in this assessment.

2. One special management concern regarding the deer and elk is discussed in this assessment regarding the opening of closed roads, new dozer lines, and improved access for suppression activities. It is recommended that these roads and dozer lines be closed as soon as possible. This proposal should help mitigate habitat loss and increased deer and elk vulnerability created by the fire, suppression impacts and rehabilitation and stabilization efforts. Other wildlife species would also benefit from this recommendation.

B. Monitoring

The following post-fire effects monitoring is recommended to determine the effects of the Waterfalls 2 Fire on listed, candidate, and proposed species:

1. Summer steelhead and bull trout spawning surveys (red counts)
2. Continue NSO breeding surveys
3. Survey for bald eagles and peregrine falcon activity in the fire area

The data from these monitoring efforts is essential to assess the long term effects of this fire, suppression, and rehabilitation work on these five species.

V. SOURCES OF INFORMATION FROM WHICH THIS REPORT WAS DERIVED:

A. Personal Communication with:

Marissa Stradley, GIS Specialist, CTWS
Rick Krause, GIS Specialist, CTWS
Suzi Miller, Range Conservationist, BIA
Doug Calvin, Wildlife Biologist, CTWS
Rick Gerhardt, Sage Sciences, Inc.
Brenda Sanchez, Soils Scientist, CTWS
Jennifer O'Reilly, USFWS
Ken MacDonald, NOAA

CTWS. 2012 Integrated Resources Management Plan for the Forested Area and Rangelands
BAER. 1996 Jefferson Fire & Simnasho Fire - Burned Area Emergency Rehabilitation Reports
BAER. 2001 Bald Peter Fire & Olallie Lake Complex Fire - Burned Area Emergency Rehabilitation Reports
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CTWS. 1997- 2012 Northern Spotted Owl Monitoring and Research
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Spotted Owl (Strix occidentalis caurina). U.S. Fish and Wildlife Service, Portland, Oregon. xvi + 258 pp.

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OPERATIONS ASSESSMENT

I. OBJECTIVES

- Identify, inventory, and map fire suppression impacts.
- Prescribe measures to mitigate fire and suppression impacts.
- Coordinate with agency and incident personnel to identify time frames to begin implementing suppression rehabilitation and safety treatments.
- Protect cultural and natural resource values during rehabilitation efforts.

II. ISSUES

- Extensive soil disturbance on highly erosive soils from fire suppression activities.
- Critical natural and cultural resources affected by suppression activities.
- Protection of cultural and natural resources during suppression rehabilitation efforts.
- Implement rehabilitation treatments to protect watershed resources and reduce risk to life and property.

III. OBSERVATIONS

A. Background

The Waterfalls 2 Fire started on August 6, 2012 as a result of one day of intense lightning activity across the entire reservation. Through September 5, 2012, the Waterfalls 2 Fire has burned 12,267 acres of reservation lands.

A Burned Area Emergency Rehabilitation (BAER) Team was activated by the Superintendent and Tribal Natural Resource Manager on August 22, 2012. Individual team members were to be provided by the local Tribe/Agency staff along with two additional team members from the BIA. Damage assessment began on the incident on August 26, 2012 following meetings with the

Agency Superintendent and Tribal Natural Resource Leaders. The BAER Team was requested to prepare a BAER plan to address potential effects of the fire and fire suppression impacts to reservation lands impacted by the Waterfalls 2 Fire. The BAER Team evaluated post fire conditions, emergency stabilization needs, suppression impacts and long-term rehabilitation actions. A plan was completed by the team and presented to the agency.

A. **Reconnaissance Methodology and Results**

On August 26, 2012 BAER Team personnel began evaluating resource impacts caused by fire and suppression actions. Team members conducted reconnaissance from the ground and the air, as well as obtained information from local sources. Information was also gathered from interviews with members of the Type II Incident management team. Central to the assessment was documenting the location of all dozer and hand lines, assessing the degree of resource impacts, and finally prescribing treatment to rehabilitate the fire and suppression impacts.

B. **Findings**

Many fire and suppression related impacts to resources and infrastructure were observed within the Waterfalls 2 Fire area. Some of the impacts observed to resources from fire and suppression were:

- 18 miles of dozer line
- 18 dozer turnarounds
- 20 miles of hand line
- 18 Drop Points throughout the fire
- 4 Safety zones
- Numerous roads damaged by suppression actions
- 1 Incident Command Post and 1 Fire Camp located at Warm Springs Fire Management building

Rehabilitation treatments for safety zones, dozer lines, and hand lines were developed by the BAER Team in conjunction with local agency managers.

Rehabilitation of suppression lines is necessary to protect habitats from noxious weed infestation, visual intrusion on the landscape and to minimize erosion. Dozer and hand lines will be rehabbed as soon as the Tribes feel that the fire has no threat of escaping the current suppression lines. Also, rehab will not proceed until cultural clearance is provided and resource specialists feel that sufficient soil moisture is present to facilitate successful line rehab.

IV. RECOMMENDATIONS (specification related)

- **Dozerline Rehab.**
  Rehabilitate dozerline, in all areas impacted by fire suppression activities.

- **Handline Rehab.**
  Rehabilitate handline, in all areas impacted by fire suppression activities.

- **Incident Command Post and Fire Camps Rehab.**
  Rehab the ICP and Fire Camps area to pre-fire condition

- **Drop Point Area Rehab.**
  Rehab 18 drop point areas used in the fire suppression activities.

- **Road Rehab.**
  Rehab all roads affected by the fire suppression activities.

Management (non-specification related)

- Continue to review rehab specifications with operators and other personnel associated with implementation of the BAER Plan to ensure specifications are clearly understood in order to protect sensitive resources.

- Guarantee safety of personnel assigned to implementing rehab plan.

- Complete all fire suppression related specifications in a timely manner, before the suppression account is closed.

- Monitor water take out points to ensure that no suppression related impacts are affecting the water or other natural resources in the area.

- Assess time frames for closing the suppression account based on dozer and hand line rehab. If 90 days following the control date is too soon to rehab the lines based on resource specialist recommendation, leave the suppression account open until this rehab meets specs found in the BAER Plan.

V. CONSULTATIONS

Jim Rice, Forest Manager CTWS

Orvie Danzuka, Assistant Forest Manager, CTWS

Bobby Brunoe, Natural Resource General Manager, CTWS

Trey Leonard, FMO, CTWS

BURNED AREA EMERGENCY RESPONSE PLAN

2012 WATERFALLS 2 FIRE

APPENDIX II COMPLIANCE

APPENDIX II – ENVIRONMENTAL COMPLIANCE

FEDERAL ENVIRONMENTAL COMPLIANCE RESPONSIBILITIES

All projects prescribed, funded or proposed for implementation on tribal lands in the Burned Area Emergency Response (BAER) Plan for the 2012 Waterfalls 2 Fire are subject to compliance with the *National Environmental Policy Act of 1969* (NEPA, 42 U.S.C. 4321-4347), in accordance with the guidelines provided in the *Council on Environmental Quality Regulations* (40 CFR 1500-1508) and other relevant federal environmental regulations such as the Endangered Species Act (ESA, 7 USC §136,16 USC.§1531 et seq.) and the Clean Water Act (33 USC §1251 et seq.). Specifically, Appendix II documents the record of the BAER Team in complying with the requirements of federal environmental laws, during development and implementation of the emergency stabilization and rehabilitation actions prescribed in the BAER Plan for the Warm Springs Reservation affected by the Waterfalls 2 Fire.

The Plan has been developed by the BAER Team, with assistance from the staffs of the Warm Springs Reservation and the Bureau of Indian Affairs. The Plan objectives are to analyze post-fire conditions and develop specific emergency stabilization and rehabilitation actions to mitigate direct and indirect resource damage to DOI administered lands and tribal lands from the Waterfalls 2 Fire. The Bureau of Indian Affairs (BIA) will complete separate NEPA analyses and compliance for fire response activities not addressed in this Plan.

Warm Springs Integrated Resources Management Plan for the Forested Area, 2007

The Warm Springs Integrated Resources Management Plan (IRMP) was reviewed by the BAER Team prior to the development of the BAER Plan to ensure that proposals developed for the Plan would be consistent with the Tribe's policies related to resource management. The IRMP conforms in scope to 25 CFR Section 163 which outlines the objectives for forest management planning on tribal lands.

CUMULATIVE IMPACT 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. For this analysis, cumulative impacts are limited to the total effect of all treatments proposed in this BAER Plan, but this analysis does not consider all other Federal or Non-Federal actions that may occur in the project areas beyond the scope of BAER. Cumulative impacts can result from individually minor, but collectively significant actions taking place over a period of time.

The BAER actions for the Waterfalls 2 Fire proposed in this plan would not result in an intensity of impact (i.e., major ground disturbance, etc.) that would cumulatively constitute a significant impact on the quality of the environment. The treatments are consistent with the Warm Springs Integrated Resource Management Plan for the Forested Area. Treatment effects are largely beneficial in response to direct and indirect fire and fire suppression impacts. Cumulatively, these BAER actions, in conjunction with suppression repair actions by fire suppression crews, are designed beneficial actions to stabilize and protect resources impacted by wildfire. No

significant cumulative adverse impacts to the biological or physical environment would result from the implementation of the Waterfalls 2 Fire BAER Plan.

APPLICABLE AND RELEVANT CATEGORICAL EXCLUSIONS

The individual actions proposed in this plan meet the requirements for a categorical exclusion (CE) from further NEPA documentation as set forth in Department of Interior Manual Part 516, Chapter 10.

Bureau of Indian Affairs Categorical Exclusions. The actions of the BAER Team, in selecting emergency stabilization and rehabilitation actions for funding, is in itself an "action", i.e. a discretionary decision, which must comply with NEPA and other environmental regulations. The BAER Team, an interagency DOI program, assesses the impacts of a wildfire on DOI lands, develops a suite of actions aimed at stabilization and rehabilitation of critical resources and protecting life and property and performs the regulatory compliance functions for the affected DOI agency. In the case of the Waterfalls 2 Fire BAER Plan, the affected agency is the Warm Springs Reservation so BAER Team staff completed compliance requirements on behalf of the BIA using BIA NEPA regulations. The Confederated Tribes of Warm Springs Reservation has an approved Integrated Resource Management Plan that guides resource management projects for Warm Springs Reservation lands.

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. All applicable and relevant BIA categorical exclusions (CEs) are listed below. CE decisions were made with consideration given to the results of required emergency consultations completed by the BAER Team and documented below.

Applicable Bureau of Indian Affairs Categorical Exclusions

516 DM 10.5 H(6). Forestry. Approval of emergency forest 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.

516 DM 10.5 H(10). Forestry. Approval of forestation projects with native species and associated protection and site preparation activities on less than 2000 acres when consistent with policies and guidelines established by a current management plan addressed in earlier NEPA analysis.

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.

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

516 DM 10.5 L(9). Roads and Transportation. Rehabilitation, reconstruction or replacement of an existing bridge structure on essentially the same alignment or location (e.g., widening, adding shoulders or safety lanes, walkways, bikeways or guardrails).

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

STATEMENT OF COMPLIANCE FOR THE 2012 WATERFALLS 2 FIRE BAER PLAN

This section documents how the Waterfalls 2 FIRE DOI BAER Team conformed to the requirements of federal environmental laws in the development of the Waterfalls 2 Fire 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 Waterfalls 2 Fire BAER Plan.

National Historic Preservation Act (NHPA) - Certain emergency stabilization and rehabilitation treatments may have the potential to affect significant tribal cultural resources and thereby require that the BAER Team comply with the implementing regulations of the National Historic Protection Act, as amended (NHPA) and as promulgated under 36 CFR Part 800. The BAER Team Archaeologist conducted a record search for recorded sites from the fire affected areas. No impacts to cultural resources were identified. The BAER Team recommended continued consultation with tribal members as a BAER Plan action in the case that potential post-fire risks to important cultural resources not included in the scope of the BAER Plan are identified in the future.

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 affected Tribes, 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.

Executive Order 13112 directs federal agencies "not to authorize, fund, or carry out actions that it believes are likely to cause or promote the introduction or spread of invasive species." Proposed treatments in the Waterfalls 2 Fire BAER Plan incorporate best management practices, such as vehicle undercarriage washing, tool cleaning, use of weed free seeds, etc, that address the concerns of this order. Additionally, specifications

are proposed to monitor and mitigate weed populations exacerbated by the fire and suppression activities.

Endangered Species Act (ESA). The BAER Team has consulted with US Fish and Wildlife
Service and National Oceanic and Atmospheric Agency (NOAA) biologists regarding actions proposed in this plan and potential effects on federally listed species and has determined that there is No Effect on threatened and endangered species.

Section 7 Consultation: Andrea Karoglanian, BAER team wildlife biologist, initiated emergency consultation by email with USFWS contact person Jennifer O'Reilly on August 16, 2012. After consulting with local Fish & Wildlife staff Andrea did a follow-up email notification on August 21 and again on August 29, 2012 with Jennifer and informed her about the fire progression and determined that there is some potential for the project to impact Northern spotted owls as there will be habitat loss in Nesting Roosting and Foraging Dispersal habitat affected by the fire. However there are no known active nesting cores within the fire perimeter. On August 29, 2012 Scott Struhs, BAER team fisheries biologist, initiated emergency consultation with NOAA contact person Ken MacDonald. A copy of the BAER Plan will be forward upon completion to both agency reps and if any potential post-fire risks to ESA species are identified in the future outside the scope of the BAER Plan that may trigger Section 7 consultation, the tribal biologists will be responsible for initiating the Section 7 consultation process.

Clean Water Act (CWA). All proposed treatments comply with CWA.

Clean Air Act. Federal Ambient Air Quality Primary and Secondary Standards are provided by the National Ambient Air Quality Standards, as established by the U.S. Environmental Protection agency (EPA) (Clean Air Act, 42 U.S.C. 7470, et seq., as amended). The BAER Team has determined that treatments prescribed for the Waterfalls 2 Fire may have short-term negligible to minor impacts to air quality due to equipment emissions and/or increases in particulates during ground-based activities, but they would not differ significantly from routine land use practices for the area. As such, all proposed treatments are in compliance with this Act.

CONSULTATIONS

Robert Brunoe, Tribal Historic Preservation Officer, CTWS	Jennifer O'Reilly, USFWS
Sally Bird, Cultural Resources Department, WSGV	Ken McDonald, NOAA
Scott Struhs, Branch of Natural Resources (BNR), CTWS	Andrea Karoglanian, BNR, CTWS

DOI EXCEPTIONS TO CATEGORICAL EXCLUSIONS

CEQ Regulations (40 CFR 1508.4) require agencies to consider whether fairly routine actions involve extraordinary circumstances that require an agency to prepare further assessment and consideration. If it is determined that any of the exceptions listed in the table below apply to the proposed actions listed above, that action may not be categorically excluded, and an EA or an EIS must be prepared. The list below is from the DOI and applies to all DOI agencies (516 DM 2, Appendix 2); agencies may have additional items on their own list of Departmental exceptions.

EXCEPTION CHECKLIST FOR BIA CATEGORICAL EXCLUSIONS

Project: Waterfalls 2 Fire BAER Plan **Date:** 9/07/2012

Nature of Proposed Action: Implement prescribed treatments and monitoring included in the Waterfalls 2 Fire Burned Area Emergency Response Plan

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	No ☒	Yes ☐

species known to occur in the area, or may promote the introduction growth, or expansion of the range of such species.

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

Selection of NEPA Action: CE ☒ EA ☐

Preparer's Name and Title:

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CONCLUSION
I have reviewed the treatments in the 2012 Waterfalls 2 Fire Burned Area Emergency Response Plan in accordance with the criteria above. All proposed treatments qualify as Categorical Exclusions. All treatments are approved for initiation.

_____ Date:_____
Warm Springs Tribal Historic Preservation Officer Concurrence with Item 7

_____ Date:_____
BIA NW Regional Archaeologist Concurrence with Item 7

Concur: _____ Date:_____
Superintendent, Warm Springs Agency

BURNED AREA EMERGENCY RESPONSE PLAN

2012 WATERFALLS 2 FIRE

APPENDIX III PHOTO DOCUMENTATION