

**SOUTH END COMPLEX
&
BASQUE WELLS & CRATERS FIRES**

**BURNED AREA
EMERGENCY STABILIZATION PLAN**

**Bureau of Land Management
Burns District Office**

**U.S. Fish and Wildlife Service
Malheur National Wildlife Refuge**



August – September 2006

**Prepared by U.S. Department of the Interior
Burned Area Emergency Response Team**

BURNED AREA EMERGENCY RESPONSE PLAN

South End Complex & Basque Wells & Craters Fires

EXECUTIVE SUMMARY

This plan addresses emergency stabilization of fire effects resulting from the South End Complex and Basque Wells and Craters Fires that occurred on the Bureau of Land Management, Burns District and Malheur National Wildlife Refuge. The South End Complex includes the Krumbo Butte, Granddad, Pueblo, Trout Creek, and Black Point Fires. The plan has been prepared in accordance with the *U.S. Department of the Interior, Department Manual, Part 620: Wildland Fire Management, Chapter 3: Burned Area Emergency Stabilization and Rehabilitation (September, 2003)* the *Bureau of Land Management (BLM), Emergency Stabilization and Rehabilitation, H-1742-1*, and *U.S. Fish and Wildlife Service Fire Management Handbook, Chapter 11*. The plan also includes recommendations for inter mixed private lands within the burned area.

The primary objectives of this Burned Area Emergency Response Plan are:

Human Life and Safety

- To prescribe post-fire mitigation measures necessary to protect human life and property

Soil/Water Stabilization

- To promptly stabilize and prevent further degradation to affected watersheds and soils

Threatened & Endangered Species Habitat Stabilization

- To prevent permanent impairment of Federal endangered Lahontan cutthroat trout habitat

Critical Heritage Resources

- To stabilize and prevent damage to known critical heritage resources

Invasive Plants

- To deter the establishment and spread of noxious and invasive species

Monitoring

- To monitor treatment effectiveness to determine if additional or amended treatments are required

A wide array of treatment options and/or actions allowable by Department of the Interior policy, have been considered to attain the above post-fire emergency stabilization objectives.

Introduction

The Department of the Interior National Burned Area Emergency Response (BAER) Team has conducted an analysis of fire effects using aerial and ground reconnaissance methods throughout the fire area. The watershed group, composed of four hydrologists and a soil scientist, assessed and mapped the overall fire impacts on watershed conditions and developed a soil burn severity map. Two vegetation and range specialists worked with local BLM and Malheur National Wildlife Refuge vegetation, range, and forestry specialists to evaluate and assess fire effects impacts to vegetation resources, including identification of noxious invasive weed populations and fire induced vegetation mortality. The range specialists worked with BLM Range and Wild Horse Specialist to assess impacts to range improvements and range conditions in existing range allotments and Wild Horse Management Areas (WHMA). An archeologist inventoried wildland fire suppression impacts and fire effects to known culturally significant sites to determine if these sites require stabilization treatments to prevent further damage or loss. The archeologist initiated consultations with the Oregon State Historic Preservation Officer and Tribes associated with the South End Complex and Basque Well and Craters Fires. The wildlife biologists in

coordination with BLM and U.S. Fish and Wildlife Service wildlife biologists conducted an assessment of fire effects to Federal Threatened and Endangered (T&E) wildlife and state protected species and their associated habitat. The biologists also evaluated suppression impacts to wildlife species and initiated emergency Section 7 consultation with the U.S. Fish and Wildlife Service, Bend Field Office. The Team Geographic Information System (GIS) specialists gathered data layers necessary for the plan, coordinated GIS activities, processed data calculations for other resource specialists, and produced maps for the BAER Plan and presentations.

Resource assessments produced by these specialists can be found in Appendix I and individual treatment specifications identified in the resource assessments and proposed for emergency stabilization funding are located in Part F, Treatment Specifications. A summary of treatment costs can be found in Part E, Cost Summary Table. An Approval Page for both BLM and U.S. Fish and Wildlife Service are provided as a signature page for agency review and approval. Appendix II contains an Environmental Assessment (EA), prepared in accordance with the requirements of the National Environmental Policy Act (NEPA). The EA analyzes reasonably foreseeable individual and cumulative impacts of treatment actions proposed in the BAER Plan, including consideration of the multiple fires that have occurred this year and in the recent past in this area. The EA also evaluates the consistency of proposed actions with existing approved management plans and associated NEPA documents. Appendix III contains photographic documentation of fire effects and Appendix IV contains BAER Plan Maps produced to assist with resource damage assessments. Appendix V contains supporting documentation for the plan.

South End Complex, Basque Wells and Crater Fires Information

The South End Complex and Basque Wells and Craters Fires began on August 21 and 22, 2006 and grew rapidly in size. While lightning ignited portions of the complex an arson investigation is currently ongoing for parts of the Grandad and Krumbo Butte Fires. Extreme fire behavior with rapid rate of spread and high flame lengths were observed during the initial burning periods. The fire burned primarily in three Great Basin fuel models including annual and perennial grasses (Fuel Model 1), sagebrush (Fuel Model 2), and to a limited degree in aspen/mountain shrub (Fuel Model 8/5) There were stringers of large juniper and aspen scattered across the upper portions of the complex that supported fire spread and occasionally torched out. The fires burned a total of 135,009 acres between the elevations of 4,140 and 8,371 feet, all within Harney County, Oregon. A Type I Incident Management Team California Interagency IMT 4 was deployed on August 22, 2006. The fires within the complex were contained on September 1, 2006. Air support included 2 light helicopters, 1 medium helicopter, 1 heavy helicopter, 1 air attack platform, 2 SEATs and 2 MAFF Units. A total of 253 persons were employed during suppression of the fire. The fire was transitioned to a Type III Incident Commander, Dave Tony on September 2, 2006.

The National Interagency BAER Team was ordered on August 29, 2006 and the Team arrived and negotiated acceptance of responsibility for preparation of the BAER Plan for the South End Complex, Basque Wells and Craters Fires on August 31, 2006 upon completion of an agency in-briefing at 0800 at the BLM, Burns District Office. Representatives of the Burns District and Malheur National Wildlife Refuge, Oregon Department of Fish and Wildlife, and U.S. Department of Agriculture, Farm Services Administration, and Natural Resource Conservation Service participated in the in-briefing. Individual private landowners that may be affected by post-fire watershed conditions were referred to the Natural Resource Conservation Service for assistance under the Emergency Watershed Protection program.

Management and Applicable Land Use Plans

The burned areas associated with the South End Complex are predominately managed for grazing, wilderness, and wildlife habitat including a Federal candidate species and three state sensitive species. A portion of the Pueblo Fire is managed as Wilderness and a Wilderness Study Area under the requirements of the Wilderness Act. Management direction relevant to emergency stabilization treatments proposed in this plan can be found in:

U.S. Department of the Interior, Bureau of Land Management. 1992. Three Rivers Resource Management Plan.

U.S. Department of the Interior, Bureau of Land Management. 2004. Andrews/Steens Resource Management Plan.

U.S. Department of the Interior, U.S. Fish and Wildlife Service. 1985. Malheur National Wildlife Refuge Master Plan.

U.S. Department of the Interior, Bureau of Land Management. 2005. Burns Interagency Fire Zone Fire Management Plan (Burns FMP).

U.S. Department of the Interior, U.S. Fish and Wildlife Service. 2001. Malheur National Wildlife Refuge Wildland Fire Management Plan.

U.S. Department of the Interior, *Department Manual, Part 620: Wildland Fire Management, Chapter 3: Burned Area Emergency Stabilization and Rehabilitation (September, 2003)*

U.S. Department of the Interior, Bureau of Land Management, 2005. *Burned Area Emergency Stabilization and Rehabilitation Handbook, H-1742-1.*

Emergency Stabilization Issues

The BAER Team delegation of authority and in-briefing provided valuable information concerning post-fire conditions and issues that need to be addressed. These issues broadly fall under the categories of:

- Protection of Human Life and Property
- Soil and Watershed Stabilization
- Threatened and Endangered Species habitat stabilization
- Stabilization of Critical Heritage Resources
- Invasive Species Control

Specific issues identified by BLM and included:

- Impacts of potential flood and debris flow to the town of Fields
- Potential flood and debris flows on Long Hollow Road and East Steens County Road
- Potential flood flows in Bridge and Mud Creek on Refuge in-stream structures
- Impacts to red-band trout habitat (a state sensitive species) and Columbian spotted frog habitat (a Federal Candidate species)
- Impacts to range improvements including fence lines and water developments
- Impacts to range conditions for grazing allotments and Wild Horse Management Areas
- Spread of known noxious weed populations into the burned area
- Loss of greater sage grouse habitat (a state sensitive species)
- Impacts to big game species including mule deer, big horn sheep and antelope
- Impacts to known historic and archeological resources

Resource Assessments

Watershed – The purpose of a burned area assessment is to determine if the fire caused emergency watershed conditions and if there are values at risk from these conditions. The Interagency BAER Team hydrologists and soil scientist conducted aerial reconnaissance flights and field visits to review resource conditions after the fire. The main objectives of the field visits were to 1) evaluate soil burn severity and watershed response in order to identify potential flood and erosion source areas; 2) identify and inventory values at risk; 3) identify the physical and biological mechanisms that are creating risks; 4) review channel morphology and riparian conditions; 5) inspect hill slope conditions; and 6) determine needs for emergency stabilization. Values at risk are residential properties, roadways, capital improvements, and cultural resources located within or downstream of the fire that may be subject to damage from flooding,

ash, mud and debris deposition. Values at risk identified from watershed conditions on the Pueblo Fire include residential and commercial structures in the town of Fields, the Long Hollow portion of the Catlow Valley Road, the East Steens County Road. Values at risk as the result of post-fire watershed conditions as a result of the Grandad Fire include approximately 25 refuge infrastructure improvements including a historic bridge, an underground power line, water diversion structures, fish ladders and screens, dikes and canals, and electrical and communication switch boxes.

The fires within the complex were dominated low soil burn severity. Soil burn severity was determined to be 0% high, 7% moderate, 46% low, and 47% unburned on the Grandad Fire and The Pueblo Fire had 0% high, 27% moderate, 54% low, and 19% unburned. Similar burn severities were found on the Basque Well, Craters, Krumbo Butte and Trout Fires. While fire intensity and behavior varied throughout the burn area, the rapid rate of fire spread through predominately fine fuels with light fuel loading, produced short fire residence times. The resulting soil burn severity is low throughout much of the burned area. High burn severity was concentrated in riparian habitat along lower Bridge Creek and Mud Creek drainages on the Grandad Fire and in isolated forest locations on the Pueblo Fire. Due to steep slopes and difficult access across large watersheds treatments on the Pueblo Fire will focus on protection of life by deployment of an early warning system to residence of the town of Fields and road closures on County Roads likely to flood. Existing water catchment basins will be cleared and spillways enhanced to ensure that they function as designed during flood events. On the Grandad Fire treatments will prevent noxious weed invasion into the burn and promote the recovery of native vegetation that will contribute to soil stabilization.

Vegetation – The purpose of the vegetation assessment is to determine if lands damaged directly by the wildland fire are likely to recover naturally from severe fire damage or if emergency stabilization treatments are required to ensure that vegetation recovery will emulate historic or pre-fire ecosystem structure, function, diversity, and dynamics. In meeting this objective the vegetation assessment team must also determine if sagebrush habitats that fall within greater sage-grouse/sagebrush obligate species use areas will recover or require rehabilitation treatment. The vegetation assessment also includes development of strategic treatments to deter the establishment and spread of noxious and invasive species within the burned area and development of management recommendations for rest of grazing allotments and Wild Horse Management Areas (WHMA).

Vegetation mortality on the Pueblo Fire was determined to be 58% high, 13% moderate-high, 12% moderate-low, and 16 low. For the Grandad Fire vegetation mortality was determined to be 40% high, 5% Moderate-high, 5% Moderate-low, and 40% low. Similar ranges of vegetation mortality were recorded for the other fires of the complex (see Vegetation Assessment Appendix I for details) For the Great Basin vegetation types moderate-low mortality was incorporated into the higher mortality because site visits indicated that while these areas had low to moderate burn severity, vegetation mortality was significantly higher. No Threatened and Endangered plant species were impacted by the fires, however the greater sage grouse, a state protected species has been impacted by the loss of sagebrush habitat. Noxious and invasive non-native plant species are known to occur within and adjoining the burned area and are expected to expand their distribution throughout the burned area without management intervention. The expansion of noxious invasive weed species can be expected to inhibit the recovery of native plant communities including the sagebrush community.

Ground seeding with range drills on 10,811 acres of BLM land and 107 acres of FWS lands is proposed to ensure recovery of native plant communities and discourage invasion of noxious weed species. Approximately 40 miles of BLM permanent fence and 11.5 miles of FWS permanent fence will be replacement and 28 miles of BLM temporary fencing and 4.7 miles of FWS temporary fence will be installed to protect critical seeding areas from grazing by cattle and wild horses. Temporary closures of range allotments are recommended to protect seeding and native vegetation recovery. Monitoring of seeding and native vegetation recovery will be implemented to determine the treatment effectiveness, determine if additional treatments are warranted, and to determine when range recovery objectives have been met. Additional monitoring will occur for noxious weed species and where necessary, noxious weed species will be chemically treated in accordance with the district's and the refuge's approved Integrated Weed Management Plan.

Wildlife – No Federally listed Threatened species occurs within the South End Complex, Basque Wells, and Crater Fires burned area. The Columbian spotted frog, a federal candidate species occurs on the Grandad Fire. Redband trout and the greater sage grouse, a BLM and state of Oregon sensitive species, have been petitioned for listing under the Federal Endangered Species Act.

To prevent permanent impairment of Federal candidate species redband trout habitat, areas of high to moderate burn severity will be reseeded as part of a separate rehabilitation plan. Reseeding of sage grouse and deer habitat is also recommended for inclusion in a subsequent burned area rehabilitation plan.

Cultural Resources – The cultural resource assessment addresses possible effects of the fire on 138 previously documented prehistoric archeological sites and historic resources. These sites will be assessed for both wildland fire effects and impacts from fire suppression activities. In addition, proposed treatments have been reviewed for potential ground disturbance by the BAER Team archeologist. Wood elements at historic sites may have been consumed by the fire and pre-historic sites may be affected by increased post-fire storm runoff. Looting and vandalism at all sites are a concern as vegetative cover that once may have concealed these sites has been removed. Four treatment specifications were prepared to address potential impacts and specific emergency stabilization needs: (1) known cultural site assessment; (2) increased law enforcement patrol; (3) cultural resources assessment clearance for treatments proposed in this plan; and (4) Native American tribal consultation.

Emergency Stabilization Recommendations

Based on aerial and ground surveys the BAER Team identified the following treatments for implementation. These treatments are in accordance with Department of the Interior, Emergency Stabilization Policy.

Bureau of Land Management:

- BAER Plan Preparation
- Project Management
- Ground Seeding – Drill
- Noxious Weed Control – Herbicide Application
- Noxious Weed – Detection
- Protective Fence/Gate – Permanent
- Protective Fence/Gate – Temporary
- Cultural Protection – Post-fire Assessment
- Cultural Resource – Protection
- Native American Consultation
- Cultural Resource Treatment Clearance
- Replace Wilderness & Boundary Signs
- Early Warning System
- Catchment Basin Clean-out
- Catchment Basin Design
- Road Crossing Clean-out
- Monitor Vegetation Treatment Effectiveness

U.S. Fish and Wildlife Service

- BAER Plan Preparation
- Project Management
- Ground Seeding – Drill
- Noxious Weed Control – Herbicide Application
- Noxious Weed – Detection
- Protective Fence/Gate – Permanent
- Protective Fence/Gate – Temporary
- Cultural Protection – Post-fire Assessment

- Cultural Resource – Protection
- Native American Consultation
- Cultural Resource Treatment Clearance
- Boundary and Area Closure Signs
- Debris Removal from Water Control Structure
- Monitor Vegetation Treatment Effectiveness

The BAER Team conducted a closeout presentation to the BLM Burns District, Malheur National Wildlife Refuge and other agency representatives on September 13, 2006, providing issues, findings and recommendations. The Team provided detailed information on the proposed emergency stabilization treatments to the agency administrators and staff. It is recommended that the implementation leaders and administrative assistance be hired as soon as possible to ensure treatments are initiated in a timely manner.

BURNED AREA EMERGENCY STABILIZATION PLAN

**SOUTH END COMPLEX
and
BASQUE WELLS & CRATER FIRES**

PART A FIRE LOCATION AND BACKGROUND INFORMATION

Fire Name	Basque Wells	Craters	Krumbo Butte	Granddad	Pueblo	Trout Creek	Black Point
Fire Number	OR-BUD-2494	OR-BUD-2506	OR-BUD-2531	OR-BUD-2501	OR-BUD-2500	OR-BUD-2461	OR-BUD-2382
Total Acres	7,202	10,767	804	46,595	68,240	1,207	195
Ignition Date/Manner	08/21/2006 Dry Lightning	08/21/2006 Dry Lightning	08/22/2006 Pending Investigation	08/21/2006 Pending Investigation	08/21/2006 Dry Lightning	08/15/2006 Dry Lightning	08/06/2006 Dry Lightning
Date Contained			09/01/2006	09/01/2006	09/01/2006		
Date Controlled	08/24/06	08/26/06	09/03/06	Not Controlled as of 9/14/06	09/03/06	08/18/2006	08/08/2006
Region	Bureau of Land Management, Oregon State Office Fish & Wildlife Service, Region 1						
State	OREGON						
County	Harney						

BURNED AREA EMERGENCY STABILIZATION PLAN

**SOUTH END COMPLEX
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BASQUE WELLS & CRATER FIRES**

PART B NATURE OF PLAN

Type of Plan (check one box below)

Initial Submission	X
Update and Revising Initial Submission	
Supplying Information For Accomplishment To Date On Work Underway	
Different Phase Of Project Plan	
Final Report (To Comply With The Closure Of The EFR Account	

EMERGENCY STABILIZATION OBJECTIVES

- **Determine need for and to prescribe and implement emergency treatments**
- **Minimize Threats to Human Life, Safety, and Property**
- **Identify Threats to Critical Cultural & Natural Resources**
- **Promptly Stabilize and Prevent Unacceptable Degradation to Resources**

BURNED AREA EMERGENCY STABILIZATION PLAN

SOUTH END COMPLEX

and

BASQUE WELLS & CRATER FIRES

PART C - TEAM ORGANIZATION

BAER TEAM MEMBERS

POSITION	TEAM MEMBER / AGENCY
Team Leader	Richard Hadley, USFWS
Deputy Team Leader	Chris Holbeck, NPS
Forester	Fred Von Bonin, BIA
Vegetation Specialist	John Morton, BIA
Hydrologist	Judy Hallisey, USFS Rich Pyzik, USFS Becca Smith, USFS Shawna Jenson, USFS
Soil Scientist	William K. Sims, BIA
Wildlife Biologist	Kenneth Griggs, FWS
Archeologist/Cultural	Carla Burnside, USFWS
Environmental Compliance	Darryl Martinez, BIA
GIS	Luther Arizana, BIA Rachel Endfield, WMAT Gerald Barnes, BIA Richard Easterbrook, NPS
Documentation	Wayne Waquiu, BIA

Resource Advisors: (Note: Resource Advisors are individuals who assisted the BAER Team with the preparation of this plan. See the consultations Section of this plan for a

full list of agencies and individuals who were consulted or otherwise contributed to the development of this plan.

Name	Affiliation	Specialty
Willie Street	Burns BLM	Range Conservationist
Jeff Rose	Burns BLM	Fire Ecologist
Darren Brumback	Burns BLM	District Fisheries Biologist
Steve Dowlan	Burns BLM	Fisheries Biologist
Nick Miller	Burns BLM	Wildlife Biologist
Richard Roy	Malheur NWR	Supervisory Biologist
Tom Downs	Malheur NWR	Maintenance Work Leader
Bill Modey	Malheur NWR	P-Ranch Substation Manager
Dan Morris	Burns BLM	Maintenance Mechanic
Pam Keller	Burns BLM	Soil Scientist/GIS Specialist

CONSULTATIONS

***** SEE RESOURCE ASSESSMENTS FOR CONSULTATION DETAILS *****

Part D Treatment Costs by Wildfire

FWS	TREATMENT	Basque Wells	Crater	Krumbo Butte	Granddad	TOTAL
1	Project Management	\$7,080	\$38,545	\$3,933	\$29,106	\$78,664
2	Ground Seeding				\$10,121	\$10,121
3	Seeding Monitoring				\$1,416	\$1,416
4	Invasive Weed Control	\$15,747	\$91,628		\$68,665	\$176,040
5	Invasive Weed Monitoring				\$12,696	\$12,696
6	Protective Fence Replacement	\$20,685	\$20,685		\$26,592	\$67,962
7	Protective Fence Temporary				\$29,578	\$29,578
8	Cultural Site Assessment	\$2,280	\$3,648	\$901	\$11,856	\$18,685
9	Cultural Site Protection	\$6,264	\$6,264	\$6,264	\$6,264	\$25,056
10	Native American Consultation	\$707	\$707	\$707	\$707	\$2,827
11	Boundary Sign Replacement	\$560	\$196		\$196	\$952
12	Debris Removal				\$22,750	\$22,750
13	Cultural Treatment Clearance				\$1,428	\$1,428
FWS Subtotal		\$53,323	\$161,673	\$11,805	\$221,375	\$448,175

Part F Treatment Specifications

SPEC #	SPEC. CAT.	PLANNED ACTION	UNITS	# OF UNITS	UNIT COST	FY07	TOTAL
1	S1	Project Management	Pay periods		\$2,751	\$78,664	\$78,664
2	S2	Ground Seeding	Acres	107	\$95	\$10,121	\$10,121
3	S3	Seeding Effectiveness Monitoring	Acres	107	\$13	\$1,416	\$1,416
4	S5	Invasive Species Control - Herbicide	Acres	3925	\$45	\$176,040	\$176,040
5	S5	Invasive Weed Monitoring	Acres	300	\$42	\$12,696	\$12,696
6	S7	Protective Fence Replacement	Miles	11.5	\$5,910	\$67,962	\$67,962
7	S7	Protective Temporary Fence	Miles	4.7	\$6,293	\$29,578	\$29,578
8	S10	Cultural Site Assessment	Sites	41	\$456	\$18,685	\$18,685
9	S10	Cultural Site Protection	Sites	41	\$611	\$25,056	\$25,056
10	S10	Native American Consultation	Consultation	1	\$2,827	\$2,827	\$2,827
11	S14	Boundary & Area Closure Signs	Signs	55	\$16	\$952	\$952
12	S6	Debris Removal	Flood Events	13	\$5,810	\$22,750	\$22,750
13		Cultural Treatment Clearance	Acres	119	\$12	\$1,428	\$1,428
TOTAL							\$448,175

PART F - INDIVIDUAL TREATMENT SPECIFICATION

TREATMENT/ACTIVITY NAME	Native American Consultation - FWS	PART E FWS	# 10
NFPORS TREATMENT CATEGORY*	Emergency Stabilization	FISCAL YEAR(S) (list each year):	2007
NFPORS TREATMENT TYPE *	Emergency Stabilization Plan Preparation	WUI? Y / N	N
IMPACTED COMMUNITIES AT RISK	NA	IMPACTED T&E SPECIES	NA
620 DM 3.7 REFERENCE	M (6) Conducting assessments of significant Native American heritage sites in those areas affected by emergency stabilization activities.	SPECIFICATION #	# 10

* See NFPORS Restoration & Rehabilitation module

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

<p>Number and Describe Each Task:</p> <p>A. General Description: Pursuant to Federal cultural resource laws, Federal Undertakings, including Emergency Stabilization that may affect significant heritage resources of religious significance or traditional cultural importance require the lead Federal agency to consult with affected tribes as equal partners. Therefore, local tribes must be consulted concerning any stabilization that may occur at, on, or near historic properties of Native American origin that are located in areas subject to emergency stabilization efforts. The Burns Paiute Tribe has been identified as the most appropriate consultation party.</p> <p>B. Location/(Suitable) Sites: Rock shelters, caves, root collection areas, traditional cultural properties and religious/sacred sites that may have been subject to fire effects and may have treatments proposed at, on, or near them. Such locations are exempt from public disclosure under the Archaeological Resources Protection Act and the National Historic Preservation Act</p> <p>C. Design/Construction Specifications: 1. Field consultation with the Cultural Resource Program Director for the Burns Paiute Tribe for a trip to each of the following fires - Basque Wells, Craters, Krumbo Butte, and Grandad Fires</p> <p>D. Purpose of Treatment Specifications (relate to damage/change caused by fire): To meet consultation requirements of Federal legislation.</p> <p>E. Treatment consistent with Agency Land Management Plan (identify which plan): Malheur National Wildlife Refuge, Master Plan/Environmental Assessment, USFWS, 1985.</p> <p>F. Treatment Effectiveness Monitoring Proposed: Field consultation will determine whether the Burns Paiute Tribe has concerns about treatment locations on each of the fires.</p>

LABOR, MATERIALS AND OTHER COST:

PERSONNEL SERVICES: (Grade @ Cost/Hours X # Hours X # Fiscal Years = Cost/Item): Do not include contract personnel costs here (see contractor services below).	COST / ITEM
GS-11 Archaeologist @ \$39.64/Hour X 40 Hours X 1 Fiscal Year =	\$1,586
1 Tribal Representative @ \$250/day X 4 days X 1 Fiscal Year =	\$1,000
TOTAL PERSONNEL SERVICE COST	\$2,586
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):	
Mileage \$0.56 mi x 430 miles X 1 Fiscal Year =	\$241
TOTAL TRAVEL COST	\$241
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
FY 07	10/01/2006	12/31/2006	F	Consultation	\$2,827	1	\$2,827
TOTAL							\$2,827

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

List Relevant Documentation and Cross-Reference Location within this BAER Plan.
 See Cultural Resource Assessment : Refer to Treatment Maps, Appendix III. Specific site locations are exempt from public disclosure under the Archaeological Resources Protection Act and the National Historic Preservation Act

COST BY FIRE

JURISDICTION	BASQUE WELL	CRATER	KRUMBO BUTTE	GRANDA D	PUEBLO	TROUT CREEK	UNITS TREATED	COST
BLM	\$707	\$707	\$707	\$707			4	\$2,827
							TOTALCOST	\$2,827

PART F - INDIVIDUAL TREATMENT SPECIFICATION

TREATMENT/ACTIVITY NAME	Cultural Site Protection	PART E FWS-#	# 9
NFPORS TREATMENT CATEGORY*	Emergency Stabilization	FISCAL YEAR(S) (list each year):	2007
NFPORS TREATMENT TYPE *	Emergency Stabilization Plan Preparation	WUI? Y / N	N
IMPACTED COMMUNITIES AT RISK	N/A	IMPACTED T&E SPECIES	N/A
620 DM 3.7	M (9) Patrolling significant heritage sites to prevent looting	Specification #	# 9

* 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: Patrol and monitor known cultural sites to prevent vandalism and looting.

B. Location/(Suitable) Sites: Basque Wells, Craters, Grandad, and Krumbo Butte Fires. Cultural resources locations are exempt from public disclosure under the Archaeological Resources Protection Act of 1979 (ARPA), and the Freedom of Information Act (FOIA).

C. Design/Construction Specifications:

1. Monitor known cultural resource sites within and adjacent to the fires which are at risk of looting and vandalism as a result of the fires. A Range Technician will assist law enforcement with monitoring cultural resource sites to show an agency presence. This person will only observe and turn over information to law enforcement if they observe illegal activities.
2. Coordinate monitoring patrols with management, archaeologists and other refuge staff. Monitoring patrols may be made in conjunction with other duties.
3. Undertake systematic and discretionary patrols, make contact as appropriate, and take action against violators.
4. If prehistoric sites are vandalized, consultation with appropriate tribe should occur.

D. Purpose of Treatment Specifications (relate to damage/change caused by fire): To enforce closures, to protect exposed, sensitive cultural resources, and to detect looters and vandals. Special attention will be given to resources that are known to be subject to active trespass, looting or vandalism. Monitoring patrols should continue until public interest decreases and vegetative re-growth has served to obscure previously exposed artifacts and features.

E. Treatment consistent with Agency Land Management Plan (identify which plan): Malheur National Wildlife Refuge, Master Plan/Environmental Assessment, USFWS, 1985.

F. Treatment Effectiveness Monitoring Proposed: Refuge will monitor for effectiveness of monitoring patrols to dissuade looting and vandalism and enforce area/road closures.

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
Range Technician GS-7 @ \$1,196/pay period X 14 pay periods X 1 Fiscal Year =	\$16,744
Law Enforcement Officer (LEO) GS-9 \$263/da X 24 days X 1 Fiscal Year =	\$6,312
TOTAL PERSONNEL SERVICE COST	\$23,056
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):	
Misc Field Supplies @ \$2000 X 1 Fiscal Year	\$2,000
TOTAL MATERIALS AND SUPPLY COST	\$2,000
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
FY 07	10/01/2006	09/31/2007	F	Sites	\$611	41	\$25,056
TOTAL							\$25,056

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

SOURCE OF COST ESTIMATE

1. Estimate obtained from 2-3 independent contractual sources.	
2. Documented cost figures from similar project work obtained from local agency sources.	
3. Estimate supported by cost guides from independent sources or other federal agencies	
4. Estimates based upon government wage rates and material cost.	P,E
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 this BAER Plan. See Cultural Resource Assessment, Appendix 1.

COST BY FIRE

JURISDICTION	BASQUE WELL	CRATER	KRUMBO BUTTE	GRANDA D	PUEBLO	TROUT CREEK	UNITS TREATED	COST
FWS	\$6,264	\$6,264	\$6,264	\$6,264			41	\$25,056
TOTAL COST								

PART F - INDIVIDUAL TREATMENT SPECIFICATION

TREATMENT/ACTIVITY NAME	Assessment of Known Cultural Resource Sites	PART E FWS	# 8
NFPORS TREATMENT CATEGORY*	Emergency Stabilization – Heritage Resources	FISCAL YEAR(S) (list each year):	2007
NFPORS TREATMENT TYPE *	Protect Heritage Sites	WUI? Y / N	N
IMPACTED COMMUNITIES AT RISK	NA	IMPACTED T&E SPECIES	NA
620 DM 3.7 REFERENCE	DM 3.7 M (9)	SPECIFICATION #	# 8

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

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

<p>Number and Describe Each Task:</p> <p>A. General Description: This treatment will entail the assessment of known National Register of Historic Places (National Register) eligible or potentially eligible prehistoric and historic archaeological sites for post-fire damage and potential risks from erosion, looting, or vandalism. This treatment may also provide for emergency BAER actions on those easily accessible sites that are deemed to be highly susceptible to looting.</p> <p>B. Location/(Suitable) Sites: Forty-one sites (habitation sites, rock art sites, rock shelters, and historic sites) have been documented within the fire perimeters or immediately adjacent to the fires on Malheur National Wildlife Refuge. Sites locations identified for evaluation are contained in a separate document. Cultural resources locations are exempt from public disclosure under the Archaeological Resources Protection Act of 1979 (ARPA), and the Freedom of Information Act (FOIA).</p> <p>C. Design/Construction Specifications: 1. Assess damage/loss at 3 rock pictograph rock art sites. Provide recommendations for supplemental treatments for those sites that may be candidates for restoration or repair.</p> <p>2. Assess post-fire risks at 5 historic sites and thirty-three (33) prehistoric sites. Provide recommendations for supplemental treatments for those sites that may be at additional risk.</p>
--

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

The purpose of this treatment is to protect significant archaeological sites from loss of integrity as the result of post-fire effects that include erosion, looting, or vandalism. It will also serve to assess any damages these resources may have sustained during the fire.

E. Treatment consistent with Agency Land Management Plan (identify which plan): Malheur National Wildlife Refuge, Master Plan/Environmental Assessment, USFWS, 1985.

F. Treatment Effectiveness Monitoring Proposed: Results of the assessment for resource risks from erosion may require the development of supplemental treatment specifications. Risks from looting and/or vandalism will be routinely monitored by the presence of increased law enforcement (see ESR Reference # 6.3.3) in coordination with the refuge archaeologist.

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
GS-11 archaeologist @ \$39.64 /hour x 320 Hours x 1 Fiscal Year =	\$12,685
Volunteer archaeologist stipend – 2 @ \$50/day x 40 days x 1 Fiscal Year =	\$4,000
TOTAL PERSONNEL SERVICE COST	\$16,685
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):	
Misc. field supplies	\$2,000
TOTAL MATERIALS AND SUPPLY COST	\$2,000
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
FY 07	10/15/2006	12/31/2006	F,V	Sites	\$456	41	\$18,685
FY__							
FY__							
FY__							
TOTAL							\$18,685

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

SOURCE OF COST ESTIMATE

1. Estimate obtained from 2-3 independent contractual sources.	
2. Documented cost figures from similar project work obtained from local agency sources.	M
3. Estimate supported by cost guides from independent sources or other federal agencies	
4. Estimates based upon government wage rates and material cost.	P
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 PLAN:

List Relevant Documentation and Cross-Reference Location within this BAER Plan. Cultural Resources Assessment, Appendix I.

COST BY FIRE

JURISDICTION	BASQUE WELL	CRATER	KRUMBO BUTTE	GRANDAD	PUEBLO	TROUT CREEK	UNITS TREATED	COST
USFWS	\$2,280	\$3,648	\$912	\$11,856	0	0	41	\$18,685
TOTAL COST								

PART F - INDIVIDUAL TREATMENT SPECIFICATION

TREATMENT/ACTIVITY NAME	TEMPORARY PROTECTIVE FENCE	PART E FWS S-#	# 7 Temporary Fence
NFPORS TREATMENT CATEGORY*	Facility & Infrastructure	FISCAL YEAR(S) (list each year):	2007
NFPORS TREATMENT TYPE *	Fence Replacement	WUI? Y / N	N
IMPACTED COMMUNITIES AT RISK	N/A	IMPACTED T&E SPECIES	N/A
620 DM 3.7 REFERENCE	3.7.M (5) Install Temporary Fence To Protect Treated Or Recovering Areas	PART E, SPEC. #	# 7

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

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

<p>A. General Description: Construct approximately 4.75 miles of temporary fences on Malheur NWR to create a trailing lane to prevent cattle from wandering onto Refuge lands burned by the South End Complex (Granddad) fires. Fences will be used to protect seeded areas or areas managed for natural recovery. Specification S10, Cultural Resource Treatment Clearance, has been written to provide for cultural clearance on any ground disturbing activities. Clearance will be obtained before any treatments proceed.</p> <p>B. Location/(Suitable) Sites: Fences are to be established on the east side of the East Canal from Knox Spring across Bridge Creek and tied into the east boundary fence of the refuge</p> <p>C. Design/Construction Specifications: Fence construction shall be in accordance with standard Burns District BLM design specifications as directed by Malheur NWR Range Conservationist. (See attached diagram)</p> <ol style="list-style-type: none"> 1. New fence materials shall be utilized. 2. Construct 4-wire fence for allotment boundaries consisting of 3 strands of 12 ½ gauge twisted barbed wire and a bottom strand of 12 ½ gauge twisted smooth wire unless high stock pressure necessitates barbed wire throughout. Steel 5 ½ foot T-posts shall be driven 1 ½ feet in the ground and spaced at 16 ½ feet apart. 3. Steel posts (stress panels) as recommended by the Refuge shall be placed at all corners or at a maximum of ¼ mile spacing or as necessary to compensate for topographical undulations. Posts are to be secured using 12 ½ gauge smooth twisted steel wire with a minimum breaking strength of 950 pounds of force. 4. Railroad ties will be planted at each bank and a 3" steel pipe will be secured. 10" gap hog panels will be suspended from the pipe with t-posts planted on the outer side of Bridge Creek.

5. Rock cribs shall be placed at areas where identified by Refuge Personnel.

D. Purpose of Treatment Specifications (relate to damage/change caused by fire): Protective/ boundary fences are to be constructed to protect burned areas from impacts from domestic livestock, wild horses.

E. Treatment consistent with Agency Land Management Plan (identify which plan): Blitzen Valley Management Plan, Malheur Refuge Fire management Plan, Burned Area Emergency Stabilization and Rehabilitation Handbook, Part III B 10, Fences, Cattleguards, and Gates.

F. Treatment Effectiveness Monitoring Proposed: The treatment will be considered successful if animals are excluded from the burned, area during the prescribed recovery period. (See Vegetation and Range Resources Assessment)

LABOR, MATERIALS AND OTHER COST:

PERSONNEL SERVICES: (Grade @ Cost/Hours X # Hours X # Fiscal Years = Cost/Item): Do not include contract personnel costs here (see contractor services below).	COST / ITEM
Project Inspector: GS-11 @ \$36.69/hr X 8 hrs/day X 5 days X 1 year	\$1,467
TOTAL PERSONNEL SERVICE COST	\$1,467
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.	
Interior Vehicle: \$0.56/mile X 800 miles X 1 year	\$ 448
TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST	\$ 448
MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item):	
12 ½ gauge domestic galvanized twisted two-point barbed wire: \$48.00/roll X 13 rolls/mile X 4.7miles X 1 year	\$ 2,933
12 ½ gauge domestic galvanized twisted smooth wire: \$45.00/roll X 5 rolls/mile X 4.7miles X 1 year	\$ 1,058
5 ½ steel painted T-posts: \$3.45/post X 400 posts/mile X 4.7miles X 1 year	\$ 6,486
42 " wire fence stays: \$35.72 /bundle X 4 bundles/mile X 4.7miles X 1 year	\$ 671
12 "X 1 5/8" Gate : \$95.40/each gate X 3 gates X 1 year	\$ 284
48" crib wire: \$68.50/roll X 3 rolls mile X 4.7 miles X 1 year	\$966
Railroad Tie: \$15.00/each X 15 ties X 1 year	\$225
TOTAL MATERIALS AND SUPPLY COST	\$12,623
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):	
Fencing Cost: \$3,200/mile X 4.7 miles X 1 year	\$15,040
TOTAL CONTRACT COST	\$15,040

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
FY_07	10/01/06	09/30/07	S	Miles	\$6293	4.7	\$29,578
FY__							
TOTAL							\$29,578

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

SOURCE OF COST ESTIMATE

1. Estimate obtained from 2-3 independent contractual sources.	
2. Documented cost figures from similar project work obtained from local agency sources.	M, C
3. Estimate supported by cost guides from independent sources or other federal agencies	E
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 Vegetation Resources Assessment, Appendix I. See Vegetation Treatments/Monitoring Map, Appendix III.

COST BY FIRE

JURISDICTION	BASQUE WELL	CRATER	KRUMBO BUTTE	GRANDA D	PUEBLO	TROUT CREEK	UNITS TREATED	COST
FWS				\$29,578			4.7	\$29,578
							TOTAL COST	\$29,578

PART F - INDIVIDUAL TREATMENT SPECIFICATION

TREATMENT/ACTIVITY NAME	PROTECTIVE FENCE REPLACEMENT	PART E FWS S-#	# 6 Permanent / Boundary Fence
NFPORS TREATMENT CATEGORY*	Facility & Infrastructure	FISCAL YEAR(S) (list each year):	2007
NFPORS TREATMENT TYPE *	Fence Replacement	WUI? Y / N	N
IMPACTED COMMUNITIES AT RISK	N/A	IMPACTED T&E SPECIES	N/A
620 DM 3.7 REFERENCE	3.7.M (5) Install Protective Fence To Protect Treated Or Recovering Areas	PART E, SPEC. #	# 6

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

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

<p>A. General Description: Reconstruct approximately 11.5 miles of protective / boundary fences between Malheur NWR and Burns BLM District burned by the South End Complex, Crater and Basque Wells fires. Remove unuseable burned fence materials, including wire. Fences will be used to protect seeded areas or areas managed for natural recovery. Specification S10, Cultural Resource Treatment Clearance, has been written to provide for cultural clearance on any ground disturbing activities. Clearance will be obtained before any treatments proceed.</p> <p>B. Location/(Suitable) Sites: Fences are to be established on original fence line locations.</p> <p>C. Design/Construction Specifications: Fence construction shall be in accordance with standard Burns District BLM design specifications as directed by Malheur NWR Range Conservationist. (See attached diagram)</p> <ol style="list-style-type: none"> New fence materials shall be utilized. Construct 4-wire fence for allotment boundaries consisting of 3 strands of 12 ½ gauge twisted barbed wire and a bottom strand of 12 ½ gauge twisted smooth wire unless high stock pressure necessitates barbed wire throughout. Steel 5 ½ foot T-posts shall be driven 1 ½ feet in the ground and spaced at 16 ½ feet apart. Steel posts (stress panels) as recommended by the Refuge shall be placed at all corners or at a maximum of ¼ mile spacing or as necessary to compensate for topographical undulations. Posts are to be secured using 12 ½ gauge smooth twisted steel wire with a minimum breaking strength of 950 pounds of force. Remove all burned fence materials from area, including wire, staples, and nails. Rock cribs shall be placed at areas where identified by Refuge Personnel. <p>D. Purpose of Treatment Specifications (relate to damage/change caused by fire): Protective/ boundary fences are to be constructed to protect burned areas from impacts from domestic livestock, wild horses.</p> <p>E. Treatment consistent with Agency Land Management Plan (identify which plan): Blitzen Valley Management Plan, Malheur Refuge Fire management Plan, Burned Area Emergency Stabilization and Rehabilitation Handbook, Part III B 10, Fences, Cattleguards, and Gates.</p> <p>F. Treatment Effectiveness Monitoring Proposed: The treatment will be considered successful if animals are excluded from the burned, area during the prescribed recovery period. (See Vegetation and Range Resources Assessment)</p>

LABOR, MATERIALS AND OTHER COST:

PERSONNEL SERVICES: (Grade @ Cost/Hours X # Hours X # Fiscal Years = Cost/Item): Do not include contract personnel costs here (see contractor services below).	COST / ITEM
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.	
Interior Vehicle: \$0.56/mile X 800 miles X 1 year	\$ 448
TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST	\$ 448
MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item):	
12 ½ gauge domestic galvanized twisted two-point barbed wire: \$48.00/roll X 13 rolls/mile X 11.5 miles X 1 year	\$ 7,176
12 ½ gauge domestic galvanized twisted smooth wire: \$45.00/roll X 5 rolls/mile X 11.5 miles X 1 year	\$ 2,528
5 ½ steel painted T-posts: \$3.45/post X 400 posts/mile X 11.5 miles X 1 year	\$15,870
42 " wire fence stays: \$35.72 /bundle X 4 bundles/mile X 11.5 miles X 1 year	\$ 1,643
12 'X 1 5/8" Gate : \$95.40/each gateX1 gate/mileX11.5milesX1 year (rounded up)	\$ 1,134

48" crib wire: \$68.50/roll X3 rolls/mileX11.5 milesX1 year	\$ 2,363						
TOTAL MATERIALS AND SUPPLY COST	\$ 30,714						
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):							
Fencing Cost: \$3,200/mile X 11.5 miles X 1 year	\$ 36,800						
TOTAL CONTRACT COST	\$ 36,800						
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
FY_07	10/01/06	09/30/07	S	Miles	\$5,910	11.5	\$ 67,962
FY							
TOTAL							\$ 67,962

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

SOURCE OF COST ESTIMATE

1. Estimate obtained from 2-3 independent contractual sources.	
2. Documented cost figures from similar project work obtained from local agency sources.	M, C
3. Estimate supported by cost guides from independent sources or other federal agencies	E
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 Vegetation Resources Assessment, Appendix I. See Vegetation Treatments/Monitoring Map, Appendix III.

COST BY FIRE

JURISDICTION	BASQUE WELL	CRATER	KRUMBO BUTTE	GRANDA D	PUEBLO	TROUT CREEK	UNITS TREATED	COST
FWS	\$20,685	\$20,685		\$26,595			11.5	\$67,962
TOTAL COST								\$67,962

PART F - INDIVIDUAL TREATMENT SPECIFICATION

TREATMENT/ACTIVITY NAME	Cultural Resource Protection – Treatment Clearances - USFWS	PART E FWS -#	#13
NFPORS TREATMENT CATEGORY*	Emergency Stabilization – Heritage Resources	FISCAL YEAR(S) (list each year):	07
NFPORS TREATMENT TYPE *	Protect Heritage Sites	WUI? Y / N	N
IMPACTED COMMUNITIES AT RISK	NA	IMPACTED T&E SPECIES	NA
620 DM 3.7 REFERENCE	M(6) Conducting assessments of significant heritage resources in those areas affected by emergency stabilization treatments	SPECIFICATION #	#13

* 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: Emergency stabilization areas designated for mechanized seeding for the control of undesirable species and erosion, and areas of temporary fencing will be assessed for potential significant heritage resources.

B. Location/(Suitable) Sites: Survey will be conducted on 107 acres within the Grandad fire perimeter and along 4.7 miles (11.4 acres) of temporary fence installation on the Grandad Fire.

- C. Design/Construction Specifications:
1. Treatment clearances will be undertaken on all areas selected for mechanized seeding or the installation of temporary fence.
 2. All cultural resources discovered or relocated will be plotted on maps and, at a minimum, be recorded on the appropriate agency form.
 3. Cultural resources, excluding those previously determined not eligible by the FWS and SHPO, or fully mitigated sites, will be flagged for avoidance and avoided during emergency stabilization activities. Flagging will be placed to minimize the potential for looting and/or vandalism and will be removed as soon as possible after reseeding of temporary fence construction is completed.
- D. Purpose of Treatment Specifications (relate to damage/change caused by fire): Conducting assessments of significant heritage sites in those areas affected by emergency stabilization treatments.
- E. Treatment consistent with Agency Land Management Plan (identify which plan): Malheur National Wildlife Refuge, Master Plan/Environmental Assessment, USFWS, 1985.
- F. Treatment Effectiveness Monitoring Proposed: Treatment effectiveness will be the avoidance of all significant heritage resources.

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
Survey crew @\$12/acre X 119 acres X 1 Fiscal Year =	\$1,428
TOTAL PERSONNEL SERVICE COST	\$1,428
EQUIPMENT PURCHASE, LEASE AND/OR RENT (Item @ Cost/Hour X # of Hours X #Fiscal Years = Cost/Item): Note: Purchases require written justification that demonstrates cost benefits over leasing or renting.	
TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST	
MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item):	
TOTAL MATERIALS AND SUPPLY COST	
TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item):	
TOTAL TRAVEL COST	
CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):	
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
FY 07	10/01/2007	12/31/2007	F	Acres	\$12	119	\$1,428
FY							
TOTAL							\$1,428

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 PLAN:

List Relevant Documentation and Cross-Reference Location within this BAER Plan.
Cultural Resources Assessment, Appendix I.

COST BY FIRE

JURISDICTION	BASQUE	CRATER	KRUMBO	GRANDA	PUEBLO	TROUT	UNITS	COST
--------------	--------	--------	--------	--------	--------	-------	-------	------

	WELL		BUTTE	D		CREEK	TREATED	
FWS				\$1,428			119	\$1,428
TOTAL COST								

PART F - INDIVIDUAL TREATMENT SPECIFICATION

TREATMENT/ACTIVITY NAME	NOXIOUS WEEDS DETECTION	PART E FWS	S5 Weed Detection
NFPORS TREATMENT CATEGORY*	MONITORING	FISCAL YEAR(S) (list each year):	2007
NFPORS TREATMENT TYPE *	TREATMENT EFFECTIVENESS	WUI? Y / N	N
IMPACTED COMMUNITIES AT RISK	N/A	IMPACTED T&E SPECIES	N/A
620 DM 3.7 REFERENCE	3.7.M (11) Integrated Pest Management Techniques	PART E, SPEC. #	# 5

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

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

<p>A. General Description: Conduct noxious weed detection surveys for possible invasion of noxious weeds on roads, hand lines, dozer lines, and other disturbed areas within the South End Complex (Grandad) Fire. Monitor existing noxious weed infestations within the burned area to determine if expansion is occurring into non-infested areas. Inventory for noxious weeds near existing locations and in areas that have a high probability for invasion within the burned area.</p> <p>B. Location/(Suitable) Sites: Survey at known locations of noxious weeds. Inventory areas that have a high potential for weed invasion (as determined by MNWR staff). Critical areas include drainages, roads, and along dozer lines of burned areas where vehicles may have run through noxious weed populations.</p> <p>C. Design/Construction Specifications:</p> <ol style="list-style-type: none"> 1. Conduct detection surveys out from known noxious weed populations within the burned area using protocol determined by the MNWR staff. Survey areas disturbed by the fire and areas close to known noxious weed populations with high likelihood of weed establishment to determine spread of noxious weed populations. Detection protocols will be established by MNWR and will be implemented in accordance with current management plans. 2. Inventory, photo document, and map new weed infestations within disturbed lands using Global Positioning System (GPS). <p>D. Purpose of Treatment Specifications (relate to damage/change caused by fire): Noxious weeds are known to expand and establish in disturbed areas. Some weeds are particularly prone to establishment following fire. It is critical to detect these new weed populations as quickly as possible to increase the likelihood of successful management of these infestations.</p> <p>E. Treatment consistent with Agency Land Management Plan (identify which plan): Malhuer National Wildlife Refuge Fire Management Plan, Blitzen Valley Management Plan.</p> <p>F. Treatment Effectiveness Monitoring Proposed: Surveys will be considered successful upon determination that all potential locations of new noxious weed populations have been visited and documented. If weeds are found, they will be treated at the earliest opportunity.</p>

LABOR, MATERIALS AND OTHER COST:

PERSONNEL SERVICES: (Grade @ Cost/Hours X # Hours X # Fiscal Years = Cost/Item): Do not include contract personnel costs here (see contractor services below).	COST / ITEM
Range Technician GS-07 @ \$14.95/hr X 320 hrs X 1 year	\$4,784
Range Technician GS-05 @ \$12.07/hr X 576 hrs X 1 Year	\$6,952
TOTAL PERSONNEL SERVICE COST	\$11,736
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 supplies @ \$400/each X 1 year	\$ 400
TOTAL MATERIALS AND SUPPLY COST	\$ 400
TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item):	
Fuel for leased vehicles: \$0.56/mile x 1000 miles/ x 1 year	\$560
TOTAL TRAVEL COST	\$560

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
FY 2007	10/01/2006	09/30/2007	F,C	Acres	\$42	300	\$12,696
FY							
TOTAL							\$12,696

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

SOURCE OF COST ESTIMATE

1. Estimate obtained from 2-3 independent contractual sources.	
2. Documented cost figures from similar project work obtained from local agency sources.	M
3. Estimate supported by cost guides from independent sources or other federal agencies	T
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 Vegetation Resources Assessment, Appendix I. See Vegetation Treatments/Monitoring Map, Appendix IV.

TOTAL COST BY JURSDICTION

JURISDICTION	BASQUE WELL	CRATER	KRUMBO BUTTE	GRANDAD	PUEBLO	TROUT CREEK	UNITS TREATED	COST
				\$12,696			300	\$12,696
TOTAL COST								

PART F - INDIVIDUAL TREATMENT SPECIFICATION

TREATMENT/ACTIVITY NAME	Invasive Weed Control	PART E FWS	#4 Weed Control-Herbicide
NFPORS TREATMENT CATEGORY*	Invasive Species	FISCAL YEAR(S) (list each year):	2007
NFPORS TREATMENT TYPE *	Chemical Treatment	WUI? Y / N	N
IMPACTED COMMUNITIES AT RISK	N/A	IMPACTED T&E SPECIES	N/A
620 DM 3.7 REFERENCE	3.7.M (11) Integrated Pest Management Techniques	PART E, SPEC. #	# 4

* 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:** Control known non-native weed infestations within the South End Complex, Basque Wells, and Crater fires perimeters prior to seed-set and maturation. Utilize integrated pest management techniques (herbicides, biological, mechanical, and cultural control methods) as appropriate to prevent the spread and establishment of noxious weeds within the fire area.
- B. Location/(Suitable) Sites:** Control all known exotic weed populations particularly along road systems, riparian areas, recreation sites, and suppression related sites within the fire area. The estimated acreage of known noxious weeds within the fire area is determined to be 3,925 acres. Refer to the proposed noxious weed control area map for exact locations of noxious weeds and weed treatment areas.
- C. Design/Construction Specifications:**
- Control noxious/non-native weeds identified during MNWR monitoring surveys prior to seed set. All acres will be treated Contractor. Use truck-mounted sprayers, ATV-mounted sprayers, or backpack sprayers (depending on access and ability for Contractors to reach infestations), to apply herbicides to selected noxious weed populations. All spraying will be in accordance with guidelines contained within MNWR management plans and approved Environmental Assessments using herbicides approved for use on FWS lands in Oregon at the time treatments take place. Examples of approved herbicides include Telar®, and Tordon®.
 - Hand grub noxious weeds located at springs and along perennial creeks where chemical treatments can not be done. Work will be conducted by Contractor.
 - Follow-up control in following 2 years on all new infestation sites as identified through noxious weed detection monitoring surveys will be through rehabilitation funding requests.

- D. Purpose of Treatment Specifications (relate to damage/change caused by fire):** Control of Listed noxious weeds needs to be conducted or they will spread into non-infested areas of the burn. Noxious weeds cause plant community destabilization, unnatural increased fire cycles, reduction in species diversity, and overall watershed degradation.
- E. Treatment consistent with Agency Land Management Plan (identify which plan):** Blitzen Valley Management Plan, Burned Area Emergency Stabilization and Rehabilitation Handbook, Part III B 16, Invasive Plant Control.
- F. Treatment Effectiveness Monitoring Proposed:** A separate specification for detection of noxious weeds and control effectiveness has been prepared. Control of noxious weeds in burned areas will be monitored according to our district protocols. Control will be considered to be successful upon determination that all noxious weeds have been eliminated or populations reduced substantially.

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
GIS Support GS-11 @ \$32/hr x 8hrs x 10 days x 1 year	\$2,560
Range Technician GS-07 @ \$15/hr x 8hrs/day x 30 days x 1 year	\$3,600
TOTAL PERSONNEL SERVICE COST	\$6,160
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):	
Herbicide: Telar® @ \$15/acre X 1882 acres X 1 year	\$28,230
Herbicide: Tordon® @ \$25/acre X 485 acres X 1 year	\$12,125
Surfactant: Syl-Tac® @ \$3/acre X 3925 acres X 1 year	\$11,775
TOTAL MATERIALS AND SUPPLY COST	\$52,130
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):	
Contractor – Weed Control @ \$30/acre x 3925 acres x 1 year	\$117,750
TOTAL CONTRACT COST	\$117,750

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
FY 2007	10/01/2006	09/30/2007	C,F,S	Acres	\$45	3925	\$176,040
FY__							
TOTAL							\$176,040

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

SOURCE OF COST ESTIMATE

1. Estimate obtained from 2-3 independent contractual sources.	
2. Documented cost figures from similar project work obtained from local agency sources.	C, M
3. Estimate supported by cost guides from independent sources or other federal agencies	
4. Estimates based upon government wage rates and material cost.	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 Vegetation Resources Assessment, Appendix I. See Vegetation Treatments/Monitoring Map, Appendix III.

TOTAL COST BY JURSDICTION

JURISDICTION	BASQUE WELL	CRATER	KRUMBO BUTTE	GRANDAD	PUEBLO	TROUT CREEK	UNITS TREATED	COST
	\$15,747	\$91,628		\$68,665			3925	\$176,040
TOTAL COST								

PART F - INDIVIDUAL TREATMENT SPECIFICATION

TREATMENT/ACTIVITY NAME	Seeding Effectiveness Monitoring	PART E FWS	S3 Seeding Effectiveness Monitoring
NFPORS TREATMENT CATEGORY*	Monitoring	FISCAL YEAR(S) (list each year):	2007
NFPORS TREATMENT TYPE *	Treatment Effectiveness Monitoring	WUI? Y / N	N
IMPACTED COMMUNITIES AT RISK	N/A	IMPACTED T&E SPECIES	N/A
620 DM 3.7 REFERENCE	3.7.M (12) Monitoring Of Treatments And Activities For Up To Three Years	PART E, SPEC. #	# 3

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

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

<p>A. General Description: This specification proposes re-seeding monitoring following drill seeding to ascertain success of re-vegetation efforts. Utilize FWS approved or similar methods established for seeded areas.</p> <p>B. Location/(Suitable) Sites: Establish monitoring transects within all seeded areas. Final site selections to be made by a BLM resource specialist. Site selection includes stratification of areas based on range sites, slope, soils, aspect, treatments (including seeding methods, seed mixes, natural release), allotments, etc.</p> <p>C. Design/Construction Specifications: Monitoring transects shall be established and methodologies designed to determine:</p> <ol style="list-style-type: none"> 1. A minimum seedling establishment of 2-3 plants per square meter and/or a minimum of 3 to 5 native, perennial herbaceous plants per square meter. 2. Sampling should determine species composition and density. 3. Count seedlings per square meter – Seeded species/Native species/Total # and compare to seeding rate per square meter for treatment success. 4. Monitor cover of vegetation, litter, rock, bare ground, and cryptogamic crusts. 5. Sampling methodologies shall represent dominant plant community type, aspect, and slope variations within the seed areas. Photos shall accompany data records as supporting documentation of findings. 6. Observations should be documented both in written and photographic documents to record other factors such as herbivory, surface erosion, etc. 7. A frequency of 30-40 Mormon Crickets per square meter shall trigger a consultation with APHIS to determine appropriate treatments. 8. Determine the quantity and distribution of noxious weed species in burned area in order to adequately conduct treatment (S5b or S5c). Continuous surveys in years 2 and 3 will also aid in further detection and minimize spread. 9. A final report shall be published that documents sampling methodologies, techniques, areas sampled, and summary of findings. <p>D. Purpose of Treatment Specifications (relate to damage/change caused by fire): Monitoring is required on all Emergency Stabilization plans. The level of monitoring required will be commensurate with the complexity of the project, level of concern, and the objectives of the plan. Monitoring and evaluation to determine the effectiveness of stabilization treatments is funded for up to three years following containment of a wildfire.</p> <p>E. Treatment consistent with Agency Land Management Plan (identify which plan):</p> <p>F. Treatment Effectiveness Monitoring Proposed: Monitoring is required to ascertain re-seeding or native release success and effectiveness of all proposed vegetation related treatments to meet the objectives that the BAER Team identified and mitigate the identified emergency to the degree anticipated. Ensure establishment or re-seeded species or species managed for natural release for soil stabilization, non-native annual species control, wildlife impacts and watershed protection.</p>
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LABOR, MATERIALS AND OTHER COST:

PERSONNEL SERVICES: (Grade @ Cost/Hours X # Hours X # Fiscal Years = Cost/Item): Do not include contract personnel costs here (see contractor services below).	COST / ITEM
Oversight: GS-11 @ \$36.69/hr. X 1 person X 8 hours/day X 1 days X 1 years	\$ 294
Seasonal workforce: GS-07 @ \$24.79/hr. X 1 personnel X 8 hours/day X 2 days X 1 years	\$ 397
TOTAL PERSONNEL SERVICE COST	\$ 691
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):	
Miscellaneous field supplies, such as scales, topo maps, tapes, etc. @ \$100/year X 1 years	\$ 100
TOTAL MATERIALS AND SUPPLY COST	
\$ 100	
TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item):	
Interior Vehicle for GS-11: \$0.50/mile X 250 miles/day X 1 days X 1 years	\$ 125
Interior Vehicle for Seasonal Crew: \$1.00/mile X 250 miles/day X 2 days X 1 years	\$ 500
TOTAL TRAVEL COST	
\$ 625	
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
FY_07_	4/1/2007	09/30/07	F	Acres	\$13	107	\$ 1,416
FY_08_							
TOTAL							\$ 1,416

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

SOURCE OF COST ESTIMATE

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

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

RELEVANT DETAILS, MAPS AND DOCUMENTATION INCLUDED IN THIS REPORT:

See Vegetation Resources Assessment, Appendix 1. See Vegetation Treatments/Monitoring Map, Appendix III.
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TOTAL COST BY JURSDICTION

JURISDICTION	BASQUE WELL	CRATER	KRUMBO BUTTE	GRANDA D	PUEBLO	TROUT CREEK	UNITS TREATED	COST
MNWR				\$1,416			107	\$1,416
TOTAL COST								

PART F - INDIVIDUAL TREATMENT SPECIFICATION

TREATMENT/ACTIVITY NAME	GROUND SEEDING	PART E FWS #	S3 Ground Seeding-Drill
NFPORS TREATMENT CATEGORY*	Invasive Species	FISCAL YEAR(S) (list each year):	2007
NFPORS TREATMENT TYPE *	Prevention/Seeding	WUI? Y / N	N
IMPACTED COMMUNITIES AT RISK	N/A	IMPACTED T&E SPECIES	N/A
620 DM 3.7 REFERENCE	3.7.M (10) Seeding To Prevent Establishment Of Invasive Plants	PART E, SPEC. #	# 2

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

A. General Description: Drill seed approximately 107 acres of moderate to high vegetation mortality in order to maintain ecological stability, minimize invasion of cheatgrass and noxious weeds (bull thistle, hoary cress, and Canada thistle), and stabilize areas identified as having high wind erosion hazard in order to minimize topsoil loss and fugitive dust. Seed mixes utilize species that are adapted to the sites and are detailed in the attached table. To maximize probability of success, seed will be applied concurrent with fall/winter moisture
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period between October and December 2006. Expected first year effectiveness includes stabilization of the soil surface, reducing topsoil loss, improving soil infiltration of moisture, providing competition for invasive non-native species and replacing any organic litter which was consumed by fire. First season vegetation establishment will be by perennial native and non-native grasses, shrubs and forbs. It is expected that vegetation establishment will be successful on all sites although the presence or absence of timely moisture could be a limiting factor.

B. Location/(Suitable) Sites: 1) Sagebrush dominated communities with moderate to high vegetation mortality that are susceptible to invasion by non-native invasive species and 2) areas identified as having high wind erosion and moderate to high burn severity. Proposed areas were prioritized and field verified based on post-fire condition, presence of invasives, and suitability for drill seeding (suitable slopes and surface rock content). Suitable sites are identified on a map in the BAER Stabilization Plan (Appendix 4, South End Complex Fire Vegetation Treatments).

C. Design/Construction Specifications:

1. Seed areas have been pre-identified for treatment and mapped by Field Office personnel.
2. Seed should be applied in the fall/winter moisture season between October and December in order to maximize probability of success.
3. The application will be conducted by rangeland drill, on areas with favorable access, soil conditions, and slope. The area should have limited rock and gentle terrain. The tractor and drill operators will apply seed as flagged and at specified rates. If seed is stored prior to application, it must be protected from moisture, stored under dry conditions and be protected from rodents.
4. Equipment is calibrated to project specifications established and administered by the local office.
5. Seed Mixture: The following seed is specified for use on this project: bluebunch wheat grass (5lbs/Ac), Sandberg's bluegrass (3 lbs/Ac), W. yarrow (0.5 lb/Ac), Blue flax (0.5/Ac).
6. The desired seed application rate for the species seed mix in the sagebrush dominated plant communities type is 20 Bulk pounds per acre.
7. Appropriate clearances (NEPA and Archeological) are to be obtained prior to implementation.
8. Monitoring will be conducted on seed application rates, treatment sites, and contact compliance during seeding operations.

D. Purpose of Treatment Specifications (relate to damage/change caused by fire): The purpose of this treatment is to establish vegetation on areas that have been burned to stabilize the sites, minimize wind erosion, and seeding to prevent establishment of invasive plants. Live native seedbanks were determined to be impacted by the fire to the extent that satisfactory establishment of native vegetation is not likely to occur within the next two growing seasons.

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

F. Treatment Effectiveness Monitoring Proposed: A separate specification for re-vegetation monitoring effectiveness has been prepared. See Specification 3, Monitoring Effectiveness. Establishment of both seeded and natural re-vegetation will be monitored according to the strategy outlined in the specification. Re-vegetation will be considered to be successful upon establishment of 3 to 5 plants per square meter on suitable sites identified in the monitoring specifications.

LABOR, MATERIALS AND OTHER COST:

PERSONNEL SERVICES: (Grade @ Cost/Hours X # Hours X # Fiscal Years = Cost/Item):		COST / ITEM					
Do not include contract personnel costs here (see contractor services below).							
Range Mgmt Spec. GS-11 @ 41.21/hr X 10 hrs X 1 yr =		\$412					
GS-7 Range Technician @ 14.95/hr X 80 hrs x 1 yr =		\$1,196					
		\$1,608					
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.							
Rangeland Drill Costs: \$8.50/acre X 107 acres		\$910					
TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST		\$910					
MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item):							
Gasoline @ 0.56 mile X 250 miles X 1 Fiscal Year =		\$140					
Upland seed mix: 107 Ac X 9 lbs/Ac X \$7.75/Ac=		7,463					
TOTAL MATERIALS AND SUPPLY COST		\$7,603					
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
FY_07	10/15/2006	12/15/2006	F	Acres	\$95	107	\$10,121
TOTAL							\$10,121

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

SOURCE OF COST ESTIMATE

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

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

RELEVANT DETAILS, MAPS AND DOCUMENTATION INCLUDED IN THIS REPORT:

Vegetation Resources Assessment, Watershed Resource Assessment, Cultural Resource Assessment Appendix I. Vegetation Treatments/Monitoring Map, Appendix III.
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TOTAL COST BY JURISDICTION

JURISDICTION	BASQUE WELL	CRATER	KRUMBO BUTTE	GRANDAD	PUEBLO	TROUT CREEK	UNITS TREATED	COST
FWS				\$10,121			107	\$10,121
							TOTAL COST	\$10,121

PART F - INDIVIDUAL TREATMENT SPECIFICATION

TREATMENT/ACTIVITY NAME	Implementation Leader - FWS	PART E FWS	
NFPORS TREATMENT CATEGORY*	Administration	FISCAL YEAR(S) (list each year):	2007
NFPORS TREATMENT TYPE *	Implementation	WUI? Y / N	N
IMPACTED COMMUNITIES AT RISK	N/A	IMPACTED T&E SPECIES	N/A
620 DM 3.7 REFERENCE	3.7 M(12) Monitoring of treatments and activities for up to three years	Specification No.	# 1

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

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

<p>Number and Describe Each Task:</p> <p>A. General Description: Fund a project leader and associated personnel to coordinate and oversee the implementation of the South End Complex ES Plan for US Fish and Wildlife Service lands. This specification provides funding for fiscal year 2007.</p> <p>B. Location/(Suitable) Sites: Treatment areas are distributed throughout four (Basque Wells, Craters, Krumbo Butte and Grandad) of the seven fires on the South End Complex on lands within US Fish and Wildlife Service jurisdiction and will need to be administered on a per fire basis.</p> <p>C. Design/Construction Specifications:</p> <ol style="list-style-type: none"> 1. The Implementation Leader is responsible for the oversight of the implementation of the South End Complex ES Plan on Malheur National Wildlife Refuge lands. 2. The Leader will implement each treatment to achieve efficient use of funds, personnel, equipment, and contracts. 3. The leader will oversee monitoring, program review, proposed plan revisions, and supplemental funding requests. 4. The leader will complete annual and final accomplishment reports. The leader manages ES budgets and tracks expenditures by specification and coordinates projects to ensure events take place in their proper order. <p>D. Purpose of Treatment Specifications: The purpose is to provide quality control and accountability over project implementation.</p> <p>E. Treatment consistent with Agency Land Management Plan (identify which plan): Malheur National Wildlife Refuge, Master Plan/Environmental Assessment, USFWS, 1985. Blitzen Valley Management Plan, Malheur National Wildlife Refuge, USFWS, 1990.</p> <p>F. Treatment Effectiveness Monitoring Proposed: The leader will prepare detailed accomplishment reports to ensure project monitoring and accountability with the aid of an administrative person.</p>

LABOR, MATERIALS AND OTHER COST:

PERSONNEL SERVICES: (Grade @ Cost/Hours X # Hours X # Fiscal Years = Cost/Item): Do not include contract personnel costs here (see contractor services below).	COST / ITEM
GS-11 Implementation leader @ \$2567/pay period (includes benefits) @ 26 pay periods X 1 Fiscal Year =	\$66,742
GS-7 Admin Assistant @ \$1893 (includes benefits)/pay period X 26 pay periods X 1 Fiscal Year x 10% =	\$4,922
TOTAL PERSONNEL SERVICE COST	\$71,664
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):	
Office materials and supplies @ \$5000/year x 1 year =	\$5,000
TOTAL MATERIALS AND SUPPLY COST	\$5,000
TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item):	
Implementation leader travel costs @ \$2,000/year x 1 year =	\$2,000
TOTAL TRAVEL COST	\$2,000
CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):	
TOTAL CONTRACT COST	0

SPECIFICATION COST SUMMARY

FISCAL YEAR	PLANNED INITIATION DATE (M/D/YYYY)	PLANNED COMPLETION DATE (M/D/YYYY)	WORK AGENT	UNITS	UNIT COST	PLANNED ACCOMPLISHMENTS	PLANNED COST
FY 07	10/01/2006	09/30/2006	F	Pay period	\$2,751	28.6	\$78,664
TOTAL							\$78,664

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
3. Estimate supported by cost guides from independent sources or other federal agencies	
4. Estimates based upon government wage rates and material cost.	P, M
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 this BAER Plan. See the Executive Summary.

TOTAL COST BY JURISDICTION

JURISDICTION	UNITS TREATED	COST
US Fish and Wildlife Service, Malheur National Wildlife Refuge	28.6 Pay Periods	\$78,664
TOTAL COST		\$78,664

COST BY FIRE

JURISDICTION	BASQUE WELL	CRATER	KRUMBO BUTTE	GRANDAD	PUEBLO	TROUT CREEK	UNITS TREATED	COST
USFWS	\$7,080	\$38,545	\$3,933	\$29,106	0	0	28.6 Pay Periods	\$78,664
TOTAL COST								\$78,664

PART F - INDIVIDUAL TREATMENT SPECIFICATION

TREATMENT/ACTIVITY NAME	FWS Debris Removal	PART E FWS S-#	#12
NFPORS TREATMENT CATEGORY*	Emergency Stabilization Erosion and Sedimentation	FISCAL YEAR(S) (list each year):	2007
NFPORS TREATMENT TYPE *	Debris Removal	WUI? Y / N	N
IMPACTED COMMUNITIES AT RISK	N/A	IMPACTED T&E SPECIES	None
620 DM 3.7 REFERENCE	620 DM 3.7(1)	SPECIFICATION #	#12

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

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

<p>Number and Describe Each Task:</p> <p>A. General Description: Normal high flow events on the refuge create a maintenance problem for operation of existing water diversions and fish screens. It is anticipated that there will be higher than normal high flow events with increased sediment and coarse woody debris loadings to the refuge as a result of the Grandad Fire. Increased maintenance activities and more frequent patrols of the refuge system during rising hydrograph are proposed to prevent blockage of 25 instream structures and potential damage to facilities.</p> <p>B. Location/(Suitable) Sites: See Watershed Treatment Map.</p> <p>C. Design/Construction Specifications:</p> <ol style="list-style-type: none"> Maintenance activities will include cleaning inlets and outlets of diversions structures using current methods (grapples, trash rakes, backhoe), cleaning of vertical fish screens of debris and inline horizontal fish screens of sediment. Provide increased vehicle patrols of refuge water delivery system during a rising hydrograph to manage water flows and to prioritize areas for maintenance activities.
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- D. Purpose of Treatment Specifications (relate to damage/change caused by fire): Increased runoff and sediment/organic debris delivery to refuge water delivery system and fish screens.
- E. Treatment consistent with Agency Land Management Plan (identify which plan): Malheur National Wildlife Refuge Master Plan and Environmental Assessment
- F. Treatment Effectiveness Monitoring Proposed: Visually inspect infrastructure prior to high runoff months to ensure no blockages exist. Clean those blockages or potential blockages that are identified

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
Add rows as necessary.	
WG-10 2 @ \$38/hour x 10 hour/day x 5 days/flood event x 3 flood events = \$11,400	\$11,400
WG-10 2 @ \$38/hour x 10 hour/day x 10 patrol days = \$7,600	\$7,600
Backhoe with operator 2 @ \$125/day x 5 days x 3 flood events = \$3,750	\$3,750
TOTAL PERSONNEL SERVICE COST	\$22,750
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.	
TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST	
MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item):	
TOTAL MATERIALS AND SUPPLY COST	
TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item):	
TOTAL TRAVEL COST	
CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):	
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
FY07	2/1/07	9/30/07	F	Flood Event	\$5,050	3	\$15,150
FY07	2/1/07	9/30/07	F	Patrols	\$760	10	\$7,600
TOTAL							\$22,750

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

SOURCE OF COST ESTIMATE

1. Estimate obtained from 2-3 independent contractual sources.	
2. Documented cost figures from similar project work obtained from local agency sources.	
3. Estimate supported by cost guides from independent sources or other federal agencies	
4. Estimates based upon government wage rates and material cost.	P,E
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 PLAN:

List Relevant Documentation and Cross-Reference Location within this BAER Plan.
Soil and Watershed Assessment Report Append 1, Watershed Modeling Analysis Append V, Watershed Treatment Map Append III

COST BY FIRE

TOTAL COST	JURISDICTION	DASSEL WELL	GRATER	AROUND BUTTE	GRAND D	FUELES	HOOT CREEK	UNITS TREATED	COST
	FWS				\$22,750			3 flood events, 10 patrols	\$22,750

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
FY__07	10/1/06	9/30/07	F	signs	\$16	55	\$952
FY__							
TOTAL							\$952

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

SOURCE OF COST ESTIMATE

1. Estimate obtained from 2-3 independent contractual sources.	
2. Documented cost figures from similar project work obtained from local agency sources.	M
3. Estimate supported by cost guides from independent sources or other federal agencies	M
4. Estimates based upon government wage rates and material cost.	M
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 PLAN:

List Relevant Documentation and Cross-Reference Location within this BAER Plan.

COST BY FIRE

JURISDICTION	BASQUE WELL	CRATER	KRUMBO BUTTE	GRANDA D	PUEBLO	TROUT CREEK	UNITS TREATED	COST
	\$560	\$196		\$196			55	\$952
TOTAL COST								

BURNED AREA EMERGENCY STABILIZATION PLAN
SOUTH END COMPLEX, BASQUE WELLS, AND CRATER FIRES
WILDLIFE RESOURCE ASSESSMENT

I. OBJECTIVES

- Assess effects of fire and suppression actions on Federally listed Threatened, Endangered, Proposed, and/or Candidate species and their habitats.
- Conduct Section 7 Emergency Consultation with the U. S. Fish and Wildlife Service.
- Prescribe emergency stabilization measures and/or monitoring.
- Assess effects of proposed stabilization actions to listed species and their habitats
- Assess fire effects to species of local concern, as identified by BLM and FWS.

II. ISSUES

A. Threatened and Endangered Species Habitat Stabilization/Recovery

One Federal Candidate species, Columbia spotted frog (*Rana luteiventris*), and its habitat occur within the fire perimeter. Measures to stabilize fire affected areas in known CSF locations through re-vegetation and mitigation of run-off will be taken. In addition, fire effects to game species of concern to BLM and USFWS are addressed and rehabilitation and management recommendations are made.

III. OBSERVATIONS

A. Background

The South End Complex, Basque Wells, and Crater Fires burned over 135,000 acres from 21 August through 29 August, 2006. Seven fires were assessed as part of the BAER Plan (Basque Wells, Black Point, Craters, Grandad, Krumbo Butte, Pueblo, and Trout Creek). The fires were started by dry lightning from large thunderstorms that swept across Harney County, Oregon. Fire behavior was largely influenced by wind and fuel continuity. Fuel types within the fire area were comprised largely of sagebrush and grass. There were stringers of juniper and aspen, often associated with drainages and/or higher elevations, scattered across the complex. Burn intensity varied across the complex, resulting in a mosaic of differential vegetation mortality and unburned areas.

The complexity, values at risk, and topography associated with these fires warranted the use of aerial resources in addition to those on the ground. Hand line, dozer line, helicopter water drops, and backfire operations were conducted in order to contain the fire, protect property, and prevent damage to natural and cultural resources. In addition, 58,000 gallons of retardant were dropped throughout the complex.

Plant communities in the lower elevation burned areas are dominated by basin big sagebrush, Wyoming big sagebrush, and low sagebrush, interspersed with western juniper (BLM 2005). As elevations increase, bitterbrush, mountain big sagebrush, bluebunch wheatgrass, and native perennials dominate (BLM 2005, BAER Vegetation Assessment). Non-native cheatgrass was detected in most locations, however it was much heavier at lower elevations. Overall, vegetation mortality (above ground biomass removal) was high (>75%) for each fire (Table 1). However, burn severity, which is a measure of fire effects to soils (Parsons 2003), was low to moderate for each fire (Table 2). These results indicate that, while there will be a temporary loss of vegetation in the fire, mountain big sagebrush, and most riparian shrub, forb and grass species will resprout and/or return from the seed bank. Species such as Wyoming big sagebrush and low sagebrush will not return for a number of years.

Table 1. Acres of low, moderate-low, moderate-high, and high vegetation mortality on the South End Complex, Basque Wells, and Craters Fires. Acreage includes BLM, FWS, and private lands.

	Low (< 25%)	Moderate-Low (26-50%)	Moderate-High (51-75%)	High (> 75%)
Basque Wells	807	940	807	4,648
Crater	1,946	206	486	8,085
Granddad	19,984	3,480	3,190	19,865
Krumbo Butte	71	64	133	527
Pueblo	11,168	6,861	6,917	43,294

Vegetation mortality was not assessed on the Black Point and Trout Creek Fires.

Table 2. Acres of unburned, low, moderate, and high burn severity on the South End Complex, Basque Wells, and Craters Fires. Acreage includes BLM, FWS, and private lands.

	Unburned	Low	Moderate	High
Basque Wells	1,099	5,576	527	0
Black Point	193	2	0	0
Crater	2,939	6,424	1,179	224
Granddad	21,673	21,680	3,232	10
Krumbo Butte	117	652	36	0
Trout Creek	312	732	163	0
Pueblo	12,713	36,805	18,716	5

Fires in this complex effected a wide range of habitats depended upon by numerous species of mammals, birds, reptiles and amphibians. The Columbia spotted frog (CSF), a federal Candidate Species, has been documented in the lower reaches of Mud Creek on both Malheur NWR and the Burns BLM District (M. Adams, USGS Corvallis, OR, pers. comm.) within the Granddad Fire perimeter (see Wildlife Assessment Map). This area was one of six known locations within the Burns District and Malheur NWR. FWS policy dictates that Federal Candidate species be addressed in the same manner as Threatened and Endangered species on FWS lands (USFWS, ESA Consultation Handbook), therefore emergency consultation with the Bend, OR, FWS Ecological Service Office, was conducted (see Findings section below).

A population of approximately 6,500 greater sage-grouse, a BLM Bureau Sensitive Species and FWS Species of Concern, is distributed throughout the Burns BLM District and Malheur NWR (Hagen 2005). The fire areas contain portions of the two largest contiguous blocks of sagebrush habitat in the state (Hagen 2005). The fire areas also contained mule deer (70,000 acres), elk (15,500), and pronghorn antelope (34,000 acres) winter range habitat. An additional 74,500 acres of year long bighorn sheep habitat was also impacted.

The Eastern Oregon Working Group of the Oregon Habitat Joint Venture has ranked the habitats of Steens Mountain, the Pueblo Mountains, Pueblo Valley, Harney Basin, and

Catlow Valley as “high” conservation priority for avian species (EOWG 2005). These areas encompass and include the fires of the South End Complex, Basque Wells, and Crater Fires. They support numerous BLM Sensitive Species and FWS Species of Concern including ferruginous hawk, northern goshawk, western burrowing owl, and willow flycatcher.

Nearly all of the perennial drainages within the fire perimeters contain Great Basin redband trout. Redband trout are a BLM “special status” species and a valued game species in the area and are subject to population declines in fire affected sites due to stream sedimentation and increased water temperatures

B. Reconnaissance Methodology and Results

Information for this assessment is based on a review of relevant literature, field observations of wildlife, habitat inventory information, consultation with U. S. Fish and Wildlife Service (USFWS), and personal communication with BLM Burns Field Office and Malheur NWR staff, ODFW personnel and species experts. Information on fire effects and behavior was gathered from interviews with fire suppression personnel and fire area reconnaissance on 31 August through 4 September, 2006, including helicopter flights over the fire area. To better understand the species and habitat information discussed in this wildlife assessment, it is important to review the BAER Vegetation Assessment. This report contains more detailed descriptions of pre-fire vegetation and post fire vegetative recovery estimates.

The purpose of this assessment is to discuss the potential effects of fire, suppression actions and proposed emergency stabilization activities to federally listed species. The Columbia spotted frog, a Federal Candidate species, is the only listed species known to occur in the burned areas. The list of species to be addressed was developed from documents referenced in this report, and input from FWS Bend Ecological Service Office biologists, BLM Burns District Biologist, and Malheur NWR resource managers.

This assessment is not intended to definitively answer the many species effects questions that are inevitably raised during an incident such as the South End Complex, Basque Wells, and Crater Fires. The focus of this assessment is to determine the potential for immediate, emergency actions that may be necessary to prevent further impacts to federally listed species and their habitats occurring within the fires. However, the local BLM and FWS offices expressed concerns over fire effects to select game species. Therefore, fire and suppression effects to greater sage grouse (*Centrocercus urophasianus*), mule deer (*Odocoileus hemionus*), elk (*Cervus elaphus canadensis*), and Great Basin redband trout (*Oncorhynchus mykiss spp.*) were assessed and recommendations are made.

C. Findings

1. Biological Assessment for Federally Listed Species

Direct effects as described in this report refer to individual mortality, or disturbance that results in flushing, displacement, or harassment of the animal. Indirect effects refer to modification of habitat and/or prey species and possible affects to the species.

Columbia Spotted Frog:

The Columbia spotted frog is a Federal Candidate Species known to occur in the lower end of Mud Creek, within the perimeter of the Granddad Fire, on both Malheur NWR and Burns BLM District lands. One CSF was detected in each of two surveys in 2002 and 2003 on Refuge lands on the lower end of Bridge Creek. This location was outside the burn perimeter and not subject to downstream effects, therefore it was not included in the fire effects analysis and emergency consultation process. The Steens Mountain populations are in the extreme southeastern extent of the CSF range (Bos and Sites 2001).

Anecdotal evidence suggests that CSF are common and often abundant in many areas of intermountain west (Idaho, western Montana, eastern Oregon, and northwest Wyoming). However, recent surveys in eastern Oregon suggest that CSF are rare, populations are small, and some declines may have occurred (Wente and Adams 2002). In the area encompassing the fires (Harney County), only five locations are known, supporting two to three populations (M. Adams, USGS, Corvallis, OR, unpub. data).

Generally, CSF inhabit pooled or flowing wetlands and moist meadows with floating and/or emergent vegetation. The Mud Creek population makes use of pools in the perennial creek and moist meadows on the flat delta near the mouth (R. Roy, USFWS, Malheur NWR, pers. comm.). Seasonal migrations are common if site conditions are unsuitable for all life history requirements (breeding, aestivation, winter hibernation, etc.), and can be greater than 2 km (Bull and Hayes 2001). CSF are generalist and opportunistic feeders with primary foods items including insects, arachnids, and mollusks (Whitaker et al. 1983).

The connectivity of populations of CSF within and adjacent to the fires is unknown. Further studies, outside the scope of this assessment, are needed to determine if each location represents an isolated population or if all are connected within a larger metapopulation structure.

Pooled water, springs, and floating and/or emergent vegetation are critical components for persistence of CSF in an area. Any stochastic event or land use practice that has a negative impact on these landscape elements poses a threat to CSF populations (Maxwell 2000, Engle 2001). A high proportion of the vegetation in known locations of Mud Creek was removed by the fire. This, coupled with other fire effects (e.g. increased sediment, ash, and flow), may result in impacts to CSF population within the fire area.

DIRECT EFFECTS: It is known that CSF occurred within the area at the time of the fire. The fine fuels at the mouth of Mud Creek were consumed quickly and the fire front likely moved through the area rapidly. Because these fuels were consumed quickly, there is little heating of the soil or water. Individuals that were in Mud Creek, or able to reach it before the flame front arrived, likely survived. This was supported by the detection of a CSF during post fire surveys by a BAER Team member. This detection was made with limited survey time (3-4 person hours), indicating that more CSF are likely still present in the area. A water temperature probe on Mud Creek showed that temperatures did not increase during the period of the fire. Also, numerous Great Basin redband trout and aquatic invertebrates were detected in Mud Creek during ground reconnaissance of the area. These findings further support the theory that individuals within the creek likely survived.

However, individuals which were in meadow areas or in vegetation adjacent to the creek may have been overcome by flames or smoke. While fine fuels do not burn intensely, they support moderate to high rates of spread. Individuals at greater distances from refuge would experience higher mortality, as their lack of mobility in vegetation would make it difficult to reach the creek. Researchers conducted surveys in Mud Creek and determined the presence of CSF, however they were not able to generate estimates of relative abundance. Because of this, it is difficult to determine the level of direct effects to this population.

INDIRECT EFFECTS: Approximately 95% of the vegetation in the area inhabited by CSF experienced moderate-high or high mortality. In contrast, approximately 57% of the area experience moderate-high or high burn severity (Table 3). These results indicate that while much of vegetation was removed by the fire it will likely return quickly. Sedges and grass species in burned areas of Mud Creek were already 3-4 inches high 10 days after the fires passed.

Table 3. Acres of vegetation mortality (A) and burn severity (B) in the lower end of Mud Creek on the Grandad Fire inhabited by the Columbia spotted frog. Acreage includes FWS and BLM land.

A					
	Low (<25%)	Low-Mod (26-50%)	Mod-High (51-75%)	High (>75%)	Total
Vegetation Mortality	0.1	0	0.4	9.2	9.7

B					
	Unburned	Low	Moderate	High	Total
Burn Severity	0	4.2	5.1	0.4	9.7

The short-term loss of vegetation could negatively impact the CSF through an increase in predation and a decrease in the amount of thermal cover available. Reduction in the amount of creekside vegetation may increase water temperatures to critical levels for the survival of the CSF. However, most of the willows, rose, and chokecherry will quickly return. This, plus the fact that area air temperatures will likely drop as fall approaches, may help mitigate this impact.

A more serious indirect effect may be caused by higher sediment loads in the creek due to increased runoff. The loss of vegetation in the watershed will result in increased soil erosion and ash flows into the creek. This runoff could fill pools used by CSF and/or degrade water quality to point where the habitat becomes unsuitable. If the rate of runoff into Mud Creek is slow, CSF would be able to move out of Mud Creek and use East Canal to find more suitable areas.

Increased sediment loads could also negatively impact CSF prey species. Runoff could decrease prey species diversity and abundance, which may displace CSF if they are unable to meet energy requirements. This may be mitigated by the fact that CSF are generalist foragers. They are able to feed on numerous species present in the system, and would likely be able to shift foraging habits to abundant species.

Emergency stabilization efforts to reseed areas near Mud Creek (see BLM Specification 3 and FWS Specification 2) and prevent runoff, will mitigate some of the indirect effects.

DIRECT FIRE SUPPRESSION EFFECTS: The only suppression activity in the Mud Creek area that could potentially impact the CSF was a fire retardant drop approximately 300 feet long on the south side of the drainage. Approximately 100 feet of this line has the potential to run-off into the creek. The other 200 feet will fall in the other direction, away from the creek and be buffered by a wide band of unburned vegetation. A small amount of the retardant may have entered the creek, as flecks of retardant were observed on a few patches of vegetation. The retardant used will become inert with exposure to UV light, and has been shown to have low toxicity to aquatic organisms (Astaris MSDS). Furthermore, a CSF and numerous redband trout and invertebrates were observed in the creek indicating that it is likely that contamination did not occur. The physical properties of the retardant, coupled with the construction of a cup trench and placement of straw waddles to catch any runoff (see Emergency Stabilization – Fire Suppression Repair section), will prevent any impacts to the creek and the CSF it supports. No dozer line or hand line was constructed in the Mud Creek area.

INDIRECT FIRE SUPPRESSION EFFECTS: If retardant entered the creek,

potential prey could be affected. As described above, the retardant will break down in the presence of UV light and has been shown to be of low toxicity to aquatic organisms. In addition, a cup trench and straw waddles surrounding the retardant will prevent it from entering the creek. No dozer line or hand line was constructed in the Mud Creek area.

Other Species of Importance

Greater sage-grouse is managed as a FWS “species of concern” and a BLM “sensitive species”. Based on a 2003 spring survey, the Burns BLM district supports 6,500 sage-grouse (Hagen 2005). The loss of sagebrush habitat will displace some individuals, but a more serious concern may be invasion of burned areas by weeds such as cheatgrass. Once invasives are established it is difficult for sagebrush and native forbs to regenerate or sprout from seed and has been shown to increase fire return interval. Intensive weed management (see FWS Specification 4 and BLM Specification 5) will increase chances of sagebrush re-establishment.

Three leks on the Pueblo Fire were burned over, while one lek on the Grandad Fire were unburned or suffered only low (<25%) vegetation mortality. One lek in the Grandad Fire, which was active, burned completely. Low and Wyoming big sagebrush around this lek suffered high mortality. The long term viability of this lek is low due to the loss of cover around the lek, which is used for escape cover and roosting by breeding sage-grouse. Approximately 60% of sagebrush habitat that is utilized year round by sage-grouse suffered moderate-high or high vegetation mortality within fire perimeters (Table 4). Habitats with this classification are known to support sage-grouse populations. Conditional/Unknown sagebrush habitat classes are more marginal habitats that have the potential to support sage-grouse, though use has not been verified. This class suffered moderate-high or high vegetation mortality of 59% within fire perimeters (Table 4.). While open lek habitat will remain available, cover near leks used for nesting and rest areas has been significantly decreased. Rehabilitation should focus on sagebrush re-establishment, with intensive monitoring of recovering burn and treatment areas.

Table 4. Acres of vegetation mortality classes within year long and conditional/unknown sage-grouse habitat on South End Complex, Basque Wells, and Craters Fires. Acreage includes BLM, FWS, and private land.

Fire Name	Habitat	Low (<25%)	Low-Mod (26-50%)	Mod-High (51-75%)	High (>75%)	Total
Basque	YL	0	0	0	0	0
Wells	CU	1	0	0	0	1

Crater	YL	0	0	0	0	0
	CU	1,048	36	75	831	1,990
Grandad	YL	23,350	3,255	2,730	17,094	46,429
	CU	15	11	21	460	507
Krumbo Butte	YL	71	64	133	526	794
	CU	0	0	0	0	0
Pueblo	YL	6,856	4,404	4,259	33,521	49,040
	CU	2,569	1,495	1,680	6,106	11,850

YL = Year long, high quality sage-grouse habitat

CU = Conditional/unknown, potential sage-grouse habitat

Within fire perimeters, vegetation mortality to ungulate winter range habitat was moderate-high to high: 67% for mule deer, 41% for elk, and 94% for pronghorn (Table 5). While elk and pronghorn may be negatively impacted by the temporary loss of cover in winter and for fawning, they may benefit from the resulting increase in grass and forb forage species. The effects of the fire to mule deer within their winter range are mostly negative. Most of the area north of the Grandad Fire and some of the lower north side of this fire has been burned and/or sprayed in the past to reduce sagebrush in order to establish crested wheatgrass. Very little sagebrush has returned to this area so mule deer winter range was already limited in this area prior to the fire. It should be noted that the relatively high levels of vegetation mortality are temporary and restricted to a small proportion of each species winter range throughout Harney County and the Columbia plateau. The ability of these species to easily move large distances will allow them to meet their energetic and habitat needs with little added stress. Negative net energetic costs to individuals and the area population as a whole will likely be negligible.

Table 5. Acres of vegetation mortality classes within mule deer, elk, and pronghorn antelope habitat on the South End Complex, Basque Wells, and Craters Fires. Acreage includes BLM, FWS, and private land.

Fire Name	Species	Low (<25%)	Low-Mod (26-50%)	Mod-High (51-75%)	High (>75%)	Total
Basque Wells	Mule Deer	306	458	444	4,284	5,492
	Elk	0	0	0	0	0

	P. Antelope	0	0	0	0	0
Crater	Mule Deer	1,445	18	27	5,944	7,434
	Elk	0	0	0	0	0
	P. Antelope	0	0	0	0	0
Granddad	Mule Deer	0	0	0	0	0
	Elk	8,352	701	959	5,413	15,425
	P. Antelope	0	0	0	0	0
Krumbo Butte	Mule Deer	17,003	1,279	1,958	30,320	50,560
	Elk	0	0	0	0	0
	P. Antelope	0	0	0	0	0
Pueblo	Mule Deer	1,590	209	275	2,062	4,136
	Elk	0	0	0	0	0
	P. Antelope	1,537	587	871	31,928	34,923

Great Basin redband trout inhabit numerous streams, creeks, and lakes in eastern Oregon. They are a BLM “special status species” and a valued game species that is managed for by FWS, BLM, and ODFW. The Burns BLM District and Malheur NWR have over 1,200 miles of streams and creeks that contain redband trout. Approximately 2% of the lengths of these streams occurred within the fire area. Of those that occurred within the area of the fires, 51% experienced moderate-high or high vegetation mortality (Table 6). The redband trout that inhabit these creeks were probably not directly affected by the fires. A water temperature probe in Mud Creek did not show that temperatures increased during or immediately after the fire burned through the area. Should water temperatures increase, the effects may be buffered by the species tolerance of warmer waters compared to other salmonids (Gamperl 2003). A larger threat to redband trout is sediment and ash flows into creeks resulting in the filling of pools and increases in pH. The level of runoff into creeks is based on many parameters and is difficult to predict. Affected streams will likely only be temporarily impaired, and depending of the rate of run-off, most trout would be able to move into more suitable waters via the East Canal. Though redband may temporarily be extirpated from some fire affected areas, the small extent of creeks affected (2%), connectivity of local populations, and their mobility, will probably result in negligible effects to the redband trout population in fire areas and Harney County in general. Rehabilitation of stream side vegetation will help mitigate indirect fire effects by trapping sediment and buffering water temperatures through shading.

Table 6. Miles of Great Basin redband trout streams with different vegetation mortality classes on the South End Complex, Basque Wells, and Craters Fires. Mileage includes BLM, FWS, and private land.

Fire Name	Low (<25%)	Low-Mod (26-50%)	Mod-High (51-75%)	High (>75%)	Total
Basque Wells	0	0	0	0	0

Crater	0.1	0.1	0.3	3.5	4.0
Granddad	11.4	1.9	1.7	7.3	22.3
Krumbo Butte	0.7	0.3	0.3	1.9	3.2
Pueblo	0.1	0.1	0	0	0.2

Riparian areas within the fire perimeters represent a fraction of the affected habitats. However, their rarity underscores their importance to the numerous species they support. Riparian habitats are important to breeding neotropical migrant birds for nesting and brood rearing. Restoration of these habitats has been recognized by the Oregon Habitat Joint Venture and Partners in Flight as being critical to neotropical migratory bird conservation. Post fire monitoring should be conducted to determine if rehabilitation of riparian habitats is warranted.

SOUTH END COMPLEX SPECIES LIST

A species list was obtained from the U. S. Fish and Wildlife Service, Bend, OR, office on September 1, 2006. This list was reviewed on September 1, 2006 by BLM biologists, Darren Brumback, Steve Dowlan, and Nick Miller, and Malheur NWR Supervisory Biologist Rick Roy for accuracy and to determine which species occur within the fire area. The following federally listed species occur, or have critical habitat with the fire area, or were potentially affected by fire suppression actions. U. S. Fish and Wildlife Policy dictates that Federal Candidate Species be treated in the same manner as species with Threatened and Endangered status on FWS lands (USFWS, ESA Consultation Handbook). Therefore, Candidate Species on Malheur NWR lands were addressed in this assessment.

COMMON NAME	SCIENTIFIC NAME	LISTING STATUS
Columbia spotted frog	<i>Rana luteiventris</i>	FC

FC = Federal Candidate

The following species were identified by the USFWS as occurring within Harney County (county where fires occurred). Through post fire reconnaissance and consultation with local experts, it was determined that these species or their Critical Habitat were not affected by the fire (no habitat within or adjacent to the fire area and/or inventories prior to the fire determined did not detect presence), or expected to be affected by potential post-fire flooding.

SPECIES	SCIENTIFIC NAME	LISTING STATUS	REASON FOR NOT ADDRESSING SPECIES IN THIS REPORT
Canada lynx	<i>Lynx canadensis</i>	T	No habitat within fire perimeter.
Bald eagle	<i>Haliaeetus leucocephalus</i>	T	No habitat within fire perimeter.
Borax Lake chub	<i>Gila boraxobius</i>	E, CH	No habitat within fire perimeter. No potential for post fire flooding, run-off, or debris flow into habitats that may occur outside of fire area.

Lahontan cutthroat trout	<i>Oncorhynchus clarki henshawi</i>	T	No habitat within fire perimeter. No potential for post fire flooding, runoff, or debris flow into habitats that may occur outside of fire area.
Bull trout (Columbia River pop.)	<i>Salvelinus confluentus</i>	T, PCH	No habitat within fire perimeter. No potential for post fire flooding, runoff, or debris flow into habitats that may occur outside of fire area.
Yellow-billed cuckoo	<i>Coccyzus americanus</i>	C	No habitat within fire perimeter.

E = Endangered
T = Threatened
CH = Critical Habitat Designated
PCH = Proposed Critical
C = Candidate species

IV. RECOMMENDATIONS

Based on the results of the above observations:

A. Emergency Stabilization – Fire Suppression Repair

It is recommended that the line of fire retardant that was dropped on the south side of Mud Creek near the lower end of the drainage should be treated as part of fire suppression rehabilitation. A cup trench should be constructed along the downhill edges of the retardant line to catch any potential runoff. The trench should be wide enough to accommodate the volume of runoff that may be generated. Straw waddles should also be placed around the retardant line as an added measure of protection. Another line of retardant was dropped just east of East Canal that has the potential to run-off into this body of water. Though much of the potential runoff will likely be buffered by the green vegetation between the retardant and the canal, a cup trench and straw waddles may be needed to accommodate larger volumes of runoff that could be generated by heavy rainfall events.

B. Emergency Stabilization

T&E Habitat Stabilization/Recovery

Seeding of fire affected areas above Mud and Bridge Creeks will be conducted to mitigate runoff and invasive weed issues that could effect the Columbia spotted frog. This treatment is being addressed in BLM Specification 3 and FWS Specification 2.

C. Rehabilitation

In a forthcoming rehabilitation plan, seeding of sagebrush species within burned areas in order to re-establish these species should be proposed. This habitat is critical to greater sage-grouse, ungulates, and numerous migratory birds. Emergency stabilization seed mixes do not contain sagebrush or other native shrub species, as mixes are meant to provide cover and stabilize soils quickly after fires. Re-establishment of sagebrush and other native shrubs through a subsequent rehabilitation plan is a crucial step in restoring burned areas to a functioning ecosystem. To the extent possible, cattle should be excluded from rehabilitation sites to prevent damage to developing seedlings/cuttings. All rehabilitation and restoration plans should be accompanied by a comprehensive monitoring plan. Data generated from monitoring efforts should be used within

an adaptive management framework, which will allow land managers to make more informed decisions on rehabilitation/restoration planning.

Riparian tree and shrub plantings should be included in future rehabilitation plans if it is determined that these species are not regenerating after the fire. Species planted should include, hawthorne serviceberry, elderberry, water birch, and snowberry. These species stabilize stream banks, provide shade to keep water temperatures down, filter run-off, and provide cover and nesting habitat to numerous avian species.

D. Management Recommendations – Non-Specification Related

1. It was determined that individual Columbia spotted frogs and nearly all of their creek-side habitat within the burn perimeter may have been affected by the fire. Emergency stabilization efforts described in this BAER report are not expected to adversely affect the CSF. Recommendations proposed in the BAER Vegetation and BAER Soil and Watershed Assessments, if implemented in a timely manner, will help to mitigate negative fire effects to CSF. The determinations documented in this report should be reassessed, and consultation conducted as needed, if additional stabilization measures or vegetation management activities are proposed after 11 September 2006. If non-emergency vegetation or hydrological management activities are proposed for long term rehabilitation and restoration of the fire area, another biological assessment should be prepared.

2. Emergency consultation was completed on 11 September 2006. Burns District BLM and Malheur NWR should send a copy of the Wildlife Assessment with a request for a letter of concurrence to the U. S. Fish and Wildlife Service, Bend Field Office.

3. Surveys for Columbia spotted frog in the Mud Creek drainage should be conducted to determine their abundance and seasonal habitat use patterns following the fires. If results of monitoring indicate a negative population trend, further measures to mitigate fire effects may be needed.

There is little information on where populations of CSF on Steens Mountain breed, hibernate, and aestivate. More advanced telemetry research should be conducted in cooperation with USGS-Corvalis, OR to describe seasonal movement patterns and the connectivity of populations in this area.

4. The recovery of riparian vegetation in Mud and Bridge Creeks should be carefully monitored to determine if replanting of areas is needed. This habitat supports a large number of terrestrial and aquatic species (through bank stabilization, shading water, and filtering sediment), and plays a key role in ecosystem processes.

5. BLM, FWS, and ODFW should work in cooperation to monitor Great Basin redband trout populations in fire affected areas. Populations may be susceptible to sedimentation creeks and streams, changes in pH, and decreases in water quality. Data from the water temperature probe in Mud Creek should continue to be analyzed to determine level of temperature increase. Increased water quality monitoring that measures, pH, dissolved oxygen, conductivity, and total dissolved solids is also recommended.

6. Sage-grouse abundance and habitat use after the fires should be documented to determine fire effects to the local population. Monitoring efforts should focus on leks and the surrounding area. Should monitoring indicate that numbers are in decline or previously used leks have been abandoned, active rehabilitation/restoration of sagebrush habitat should be conducted.

7. Monitoring the recovery of sagebrush habitat should be conducted on two scales. Efforts should focus on determining the effectiveness of passive (no management actions taken) and active (seeds/rooted stock planted, weeds

controlled, etc.) recovery/regeneration. The impacts of grazing on rehabilitation plots should also be evaluated. In addition to sage-grouse, numerous other wildlife species rely on this habitat to meet their life history needs.

8. BLM, FWS, and ODFW should work cooperatively to track populations of mule deer, elk, pronghorn antelope, and bighorn sheep within and adjacent to burned areas. Description of their habitat use in relation to burned areas (from 2006 and previous year's fires) and season should be conducted. Both positive (e.g. increased forage) and negative (e.g. loss of fawning cover) impacts of the fire should be explored.

DETERMINATION OF EFFECTS TO LISTED SPECIES

COLUMBIA SPOTTED FROG

FIRE EFFECTS: CSF that were using areas away from creek edges may have been killed when the fire passed. Indirectly, sediment and ash from run-off could fill in-stream pools, raise pH, and generally degrade water quality resulting in negative affects to the CSF.

SUPPRESSION ACTION EFFECTS: There was no direct effect to CSF from any fire suppression action. No hand line or dozer line was cut near Mud Creek, and no engines traveled off road in the area. A small amount of retardant was dropped near the mouth of Mud Creek. Approximately, 100 feet of a fire retardant line has the potential to run-off into the creek. However, the retardant used will become inert with exposure to UV light, and has been shown to have low toxicity to aquatic organisms (Astaris MSDS). If fall rains occur within 4 to 6 weeks after the fire as anticipated, any retardant on the ground is likely to be inert before any runoff event is realized. Construction of a cup trench and placement of straw waddles, as prescribed for suppression rehabilitation, provide an added layer of protection to the creek. Weighing these factors, the determination of suppression effects to Columbia spotted frogs across the fire areas is **may affect, not likely to adversely effect**.

PROPOSED EMERGENCY STABILIZATION ACTION EFFECTS: All of the proposed burned area stabilization measures should have no effect or a beneficial effect on the Columbia spotted frog and its habitat. Therefore, the determination is **no effect**.

SUPPRESSION AND EMERGENCY STABILIZATION MEASURES

SUPPRESION DAMAGE REHABILITATION

- Repair or remediate fire retardant drops

BURNED AREA EMERGENCY STABILIZATION TREATMENTS

- Reseeding burned areas
- Monitor seeding effectiveness
- Noxious weed control
- Monitor effectiveness of weed control
- Protective fence replacement
- Construct protective temporary fence
- Assess cultural sites
- Protect cultural sites
- Replace boundary and area closure signs
- Install flood early warning system

- Clean out catchment basins and road crossings

V. CONSULTATIONS

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Air Quality

Affected Environment

Under criteria established through the Clean Air Act, as amended in 1990, the area of the fires has been designated as Class II, meaning that air quality is good to excellent. Potential to affect Class I airsheds (i.e. Strawberry Mountain Wilderness) does exist. The nearest non-attainment area is Lakeview Oregon. The air pollutant of most concern is particulate matter originating from fire, road or windblown dust, and vehicle use. Most of this PM is produced from fire, is PM₁₀ and can have effects on human health. Southeast Oregon has been designated as a “clean air source” by the Grand Canyon Visibility Transport Commission.

Environmental Consequences

Alternative I - No Action

Because much of the protective surface vegetative cover burned, adverse effects to air quality and visibility due to increased particulate matter (PM₁₀) from wind-blown dust and ash may occur. Localized blowing ash and soil would occur until the burned soil surface receives enough soil moisture to prevent it from blowing, a physical soil crust forms, or vegetation is reestablished. There would not be any additional soil disturbance from fire rehabilitation treatments, so no additional fugitive dust emissions would occur.

Cumulative Impacts

Without any seeding or livestock closure, the burned area is more likely to re-vegetate with undesirable species resulting in lost soil, soil productivity, and vegetative cover. The area would be subject to further blowing dust.

Alternative II - Proposed Alternative

Localized blowing ash and soil would occur until the burned soil surface receives enough soil moisture to prevent it from blowing, a physical soil crust forms, or vegetation is reestablished. Treatments which disturb the soil surface would generate dust during implementation. However, implementation of the treatments would speed up the re-vegetation process through seeding and rest from grazing for a minimum of two growing seasons.

Cumulative Impacts

Although there would be a slight increase in dust production during implementation, long term cumulative effects of treatments would reduce future fugitive dust emissions to conditions similar to those of pre-fire.

Water Quality

Affected Environment

Ground water quality is not affected by the proposed action. Therefore it will not be addressed in this document.

The burn areas contain several perennial and intermittent streams, reservoirs and lakes on both public and private lands. Most surface runoff is from snowmelt or rainfall in higher elevations, producing peak discharges in the spring and early summer. Higher discharges and flooding may occur during winter rain on snow events. Many of the streams in lower elevation semi-arid areas

are either intermittent, with segments of perennial flow near springs, or ephemeral, with flow only during spring runoff and intense summer storms.

The lower portion of the Grandad fire burned lands administered by the Malheur National Wildlife Refuge. These lands are irrigated through a very intricate system of canals, ditches, pipes, gates, and dams. Two main canals, East Canal and West Canal, parallel the Blitzen River along the valley toe-slopes and deliver water to a series of ponds, wetlands, and fields. Water is manipulated during low flows and peaks flows in a complex arrangement and pattern of diverting water. Fish screens on East Canal protect redband trout passage. All infrastructures require high maintenance and frequent cleaning from sediment and debris. Riparian vegetation was lost along the lower segments of Mud and Bridge Creeks.

The Pueblo fire burned across the watershed of Fields Creek that drains through Williams Canyon and the community of Fields, Oregon. Rain-on-snow weather events impact this watershed and as recently as April, 2006, such an event produced a flood that inundated structures in the town. The fire also burned the upper watershed of Skull Creek and the watershed of Long Hollow. Catlow Valley county road lays in the narrows of Long Hollow, immediately adjacent to the stream. This road is the main north-south access for the community of Fields, Oregon and travelers to/from Nevada.

Environmental Consequences

Alternative I – No Action

The no action alternative would have negative effects to the watersheds of the project area. Pre-fire conditions of flashy hydrologic responses to storm events will continue, resulting in periodic flooding of infrastructure, roads, and fields. Risk to human life and safety would exist due to flooding of homes and roads. Wind erosion on burn areas will increase until vegetation naturally recovers. Also the erosion hazard will slightly increase sediment production and may negatively affect water quality in all perennial streams and the water system on the refuge. Roads may experience washouts and prevent access. The no action alternative could negatively impact wetlands and riparian zones if water diversion gates and fish screens fill up with sediment and water cannot be routed through the refuge.

Alternative II – Proposed Alternative

Closing burned areas to livestock grazing until these areas can recover will benefit wetland and riparian areas by allowing for growth and establishment of riparian plant communities.

Seeding of the burned areas will recover watershed vegetation and reduce wind erosion and surface production of sediment, thus improving water quality and reducing maintenance of the refuge's water infrastructure.

Cleaning out existing water holes and catchments will increase their holding capacity and reduce surface runoff down the drainages of Bridge, Mud, Fields, and Long Hollow. As vegetation recovers, infiltration and evapo-transpiration will increase, reducing surface runoff.

Additional patrolling and cleaning of the water infrastructures downstream of Bridge and Mud Creeks on the refuge will maintain water flows, reducing risk of failure of the structures and canal roads. This will have the overall effect of improving post-fire water quality.

Installing an early warning system will have no effect to the watershed or soils.

Cumulative Impacts

Under the proposed action alternative, vegetation cover of the watersheds will recover, reducing runoff and sediment production, and improving water quality. Access to public lands and along public roads will be maintained while reducing risk to human safety. Humans would be alerted to severe weather events and able to evacuate areas at risk of flooding. Overall water quantity from fire-induced surface runoff would be reduced.

BURNED AREA EMERGENCY STABILIZATION PLAN

SOUTH END COMPLEX, BASQUE WELLS, AND CRATERS FIRES

SOIL AND 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,
- Develop a map of soil burn severity,
- 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, erosion, and sediment deposition,
- Develop treatment recommendations, if necessary, and
- Identify future monitoring needs, if necessary.

II. ISSUES

C. Human Health & Safety

- Risk to human life from flooding along travel routes of Highway 205 (Catlow Valley), portions of East Steens Road, and Fields-Denio Road.
- Risk to human life and property from flooding within the community of Fields, Oregon.

D. Soil/Watershed Stabilization

- a. Increased erosion and sediment delivery into irrigation canals, fish screens, weirs, and fish habitat on the Malheur National Wildlife Refuge.
- Soil productivity (wind/water erosion).
- Loss of road infrastructure and access.

E. T&E Habitat Stabilization/Recovery

- No issues under this category.

F. Cultural Heritage Resources

- No issues under this category

G. Invasive Plants

- No issues under this category

III. OBSERVATIONS

A. Background

1. Physiography

The South End Complex, Basque Wells & Craters Fires are within the southern portion of the Three Rivers Resource Area and portions of the Andrews Management unit/Steens Mountain Cooperative Management and Protection Area within the Burns District of Bureau of Land Management (BLM) in Harney County, Southeastern Oregon. These fires also burned small portions of the Malheur National Wildlife Refuge within the center of the Burns District of BLM.

Elevations within these management areas range from less than 4100 feet to 9700 feet. The wildfires lie in the northwest portion of the hydrographic Great Basin, where drainage is internal with no outlet to the Pacific Ocean. These enclosed basins

include Malheur Lake, Harney Lake, Alvord Lake and Garrison Lake. These wildfires are also in the northwest portion of the Basin and Range physiographic province which evolved approximately 18 million years ago as a result of regional east-west extension. About 10 million years ago fault-block mountains with intervening valleys formed. These landforms include the Steens Mountain and Blitzen Valley.

2. Geology and Soils

Geology information came from the Burns District BLM office and the soils information is from the Harney County Area Soil Survey (2005). The Pueblo and Granddad Fires are on the uplifted westward-tilting Steens Mountain fault block. Basque Wells and Craters fires are on the down dropped fault block of Blitzen Valley. Fault movement continues today.

The wildfire area is underlain by Steens Basalt lava flows that extruded approximately 18 million years ago and covered an area 100 by 180 miles centered at Steens Mountain, where individual thin flows total 3,000 feet thick. At Pueblo and Granddad Fires, the Steens Basalt is sporadically capped by younger welded tuff deposits up to 50 feet thick (the welded tuff is from calderas 15 million years old located 20 to 50 miles southeast of Steens Mountain and from calderas 9.5 million years old and 6.5 million years old located 10 to 20 miles north of Basque Wells fire). At Basque Wells Fire, the Steens Basalt is continuously capped by younger welded tuff deposits more than 50 feet thick. At Craters Fire, the Steens Basalt and welded tuffs are overlain by local basalt flows that are 16,000 years old.

Less than one million years ago, alpine glaciers formed an ice cap on top of Steens Mountain; the ice cap extended downhill as far as the eastern edge of Granddad Fire. The other fires were below the elevation of the ice cap. Between 24,000 and 12,000 years ago, increased precipitation in the hydrographic Great Basin formed an ancient lake in Blitzen Valley that was below the elevation of the fires.

Soils vary greatly depending on landform, slope position, and parent material. They are described in detail in the Soil Survey of Harney County. Only very generalized descriptions are summarized for this report.

The soils within the wildfire area are comprised of 11 general mapping units, which are made up of 88 individual soil-mapping units.

Basque Wells Fire is comprised of the following general soil units: Alvodest-Droval Playas 1-3% slopes; Felcher-Skedaddle 20-40% slopes; Poujade-Ausmus-Swalesilver 2-5% slopes and Raz-Brace-Anowalt 2-20% slopes. The majority of these soils are shallow and located on old lake terraces, hillsides and southwest facing mountainsides. Erosion potential for both wind and water is medium to low.

Craters Fire is comprised of the following general soil units: Fury-Skunkfarm-Housefield 0-2% slopes; Poujade-Ausmus-Swalesilver 2-5% slopes; Raz-Brace-Anowalt 1-40% slopes, and Reallis-Vergas-Lawen 0-20% slopes. The majority of these soils range from very deep to very shallow and are located on basalt flows, rock outcrop, pressure ridges, hills and tablelands. Erosion potential for both water and wind is low to medium.

The South End Complex Fire (Black Point, Granddad, Krumbo Butte, Pueblo, and Trout Creek) is comprised of the following general soils units: Alvodest-Doval-Playas 0-3% slopes; Atlow-Tumtum-Deppy 5-30% slopes; Baconcamp-Clamp-Rock Outcrop 3-70% slopes; Felcher-Skedaddle 8-70%; Fury-Skunkfarm-Housefield 0-2 % slopes; Ninemile-Westbutte-Carryback 2-65% slopes; Poujade-Ausmus-Swalesilver 0-5%; Raz-Brace-Anowalt 2-40% slopes; Reallis-Vergas-Lawen 2-20% slopes, and Spangenburg-Enko-Catlow 0-8% slopes. The majority of these soils range from very deep to shallow and are located on hills, pediments, mountainsides, fan terraces, old lake terraces, alluvial fans and tablelands. Erosion potential for both water and wind is medium to low, except for an estimated 6500 acres of high water erosion potential on the Pueblo Fire.

3. Climate

Harney County is characterized by an arid climate with low relative humidity, high evaporation and abundant sunshine. Summers are hot with average monthly maximum temperatures of 95 degrees Fahrenheit and extremes above 110 degrees. Winters are

cold with average monthly maximum temperatures of 15 degrees Fahrenheit and extremes below -40 degrees. Weather is often the result of maritime air moving eastward from the Pacific Ocean over the Cascade Mountain ranges where much of the moisture in the air condenses, making the air relatively dry by the time it reaches southeastern Oregon. Average precipitation in the region is between 8 and 14 inches, with isolated areas receiving up to 30 inches or more in high elevations. Most precipitation occurs from November through February, with about one-third falling as snow. At elevations below 6,000 feet, the snowpack usually melts by April; at higher elevations it can remain until mid-June. Localized flooding often follows spring snowmelt. Rain-on-snow weather events can be common. High intensity thunderstorms occur between April and September; storms during June and July are typically drier than those in August or September. The prevailing winds are west-southwest.

4. Hydrology and Water Quality

The fires burned across portions of Guano, Harney/Malheur Lakes, and Donner and Blitzen subbasins. All are part of the larger Oregon Closed Basins Subregion and Pacific Northwest Region. The BLM and Malheur National Wildlife Refuge maintain water rights and uses in accordance with Oregon law. The State of Oregon recognizes instream water rights for public benefit to maintain flows to protect recreation, fish, wildlife and other river related resources. Additionally federal reserved water rights may be applied to certain springs and waterholes.

The fire areas contain several perennial and intermittent streams, reservoirs and lakes on both public and private lands. The hydrologic budgets in the fire-affected watersheds are considered snow-dominated hydrologic regimes. Most surface runoff is from snowmelt or rainfall in higher elevations, producing peak discharges in the spring. These flows are considered the normal-channel forming flows. Spring rain events can modify the timing and increase the magnitude of snowmelt runoff by accelerating melt. Other peaks in the hydrograph are generated by warm "rain-on-snow" events during winter months when marine storms driven by warm southwesterly winds cause rapid snowmelt over frozen soils. Rapid snowmelt is most likely to occur on south and west aspects between 2000 and 5000 feet above mean sea level (asl) in other areas of the intermountain NW region, but in the geographic area of the fires, rain-on-snow phenomena has been observed over 6,000 feet asl. The resultant peak flows have eclipsed those of spring snowmelt. At higher elevations, the snowpack and soil generally stay frozen during such events and add little to rain-on-snow peaks. When soils are frozen, vegetation does not transpire and has negligible effects to runoff. Loss of forest cover in high elevations can increase snowpack depth and drift.

Many of the streams in lower elevation semi-arid areas are either intermittent, with segments of perennial flow near springs, or ephemeral, with flow only during spring runoff and intense summer storms.

The lower portion of the Grandad Fire burned lands administered by the Malheur National Wildlife Refuge. These lands are irrigated through a very intricate system of canals, ditches, pipes, gates, and dams. Two main canals, East Canal and West Canal, parallel the Blitzen River along the valley toe-slopes and deliver water to a series of ponds, wetlands, and fields. Water is manipulated during low flows and peaks flows in a complex arrangement and pattern of diverting water. Fish screens on East Canal and lower Bridge Creek prevent redband trout from being diverted into irrigation ditches and fields. All infrastructure requires high maintenance and frequent cleaning from sediment and debris. The refuge operates a streamflow gauge on lower Bridge Creek.

The Pueblo Fire burned across the watershed of Fields Creek that drains through Williams Canyon and the community of Fields, Oregon. Rain-on-snow weather events impact this watershed and as recently as April, 2006, such an event produced a flood that inundated structures in the town. NOAA and SNOTEL records from the nearest weather station on Fish Creek indicate a precipitation increase of over 2 inches in early April and a snowpack of over 100 inches.

5. Air Quality

Under criteria established through the Clean Air Act, as amended in 1990, the area of the fires has been designated as Class II, meaning that air quality is good to excellent. Potential to affect Class I airsheds (i.e. Strawberry Mountain Wilderness) does exist. The nearest non-attainment area is Lakeview Oregon. The air pollutant of most concern is particulate matter (PM₁₀ and PM_{2.5}) originating from fire, road or windblown dust, and vehicle use. Most of this particulate matter is produced from fire and can have effects on human health. Southeast Oregon has been designated as a “clean air source” by the Grand Canyon Visibility Transport Commission.

B. Reconnaissance Methodology and Results

The purpose of a burned area assessment is to determine if the fire caused emergency watershed conditions and if there are values at risk from these conditions. If emergency watershed conditions are found, and values at risk are identified, 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. Emergency watershed conditions include assessment of both hydrologic and soil factors. The most significant factor is loss of ground cover, which leads to erosion and changes in hillslope hydrologic function in the form of decreased infiltration and increased runoff. Such conditions lead to increased flooding, sedimentation and deterioration of soil condition.

Burned area evaluations included:

- Identifying fire-caused changes in soil properties and hydrologic function;
- Determining spatial extent and strength of hydrophobic soil conditions;
- Determining post-fire infiltration rates;
- Verifying and modifying the Burned Area Reflectance Classification (BARC) image to create soil burn severity and watershed response maps;
- Identifying sediment source areas and erosion potential;
- Determining current channel and culvert capacities; and
- Identifying potential threats to human life, property, and critical natural and cultural resources (values at risk).

The Interagency BAER Team hydrologists and soil scientist conducted aerial reconnaissance flights and field visits to review resource conditions after the fire. The main objectives of the field visits were to 1) evaluate soil burn severity and watershed response in order to identify potential flood and erosion source areas; 2) identify and inventory values at risk, 3) identify the physical and biological mechanisms that are creating risks; 4) review channel morphology and riparian conditions; 5) inspect hillslope conditions; and 6) determine needs for emergency stabilization.

Values at risk are human life, properties, and capital improvements located within or downstream of the fires that may be subject to damage from flooding, ash, mud and debris deposition, and hillslope erosion.

A Burned Area Reflectance Classification (BARC) is a satellite-derived map of post-fire changes in spectral reflectance. This is used in combination with field observations to develop a map of post-fire soil and watershed condition. Landsat imagery was acquired August 31, 2006 and was used in combination with a pre-fire Landsat image from a similar time of year to produce the BARC map for the fire. The BARC map was evaluated by field visits and helicopter reconnaissance to produce the final soil burn severity map. The soil burn severity map was used to evaluate post-fire erosion rates and watershed response. If this map is to be used in long-term ecosystem recovery planning or monitoring, more extensive ground verification is recommended.

1. Soil Burn Severity

Soil burn severity is not the same concept as fire intensity and fire severity as recognized by fire behavior specialists. Fire intensity and fire severity relate to fire behavior and fire effects on overstory vegetation and ground fuels, respectively while soil burn severity relates specifically to effects of the fire on soil conditions (e.g., amount of surface litter and duff, infiltration rate, erodibility, soil structure). Although soil burn severity is not based primarily on fire effects on vegetation, post-fire vegetative conditions and pre-fire vegetation density are among the indicators used to assess soil burn severity, and are among the primary factors affecting post-fire spectral response upon which the BARC classification algorithm is based. In combination with field observations, a soil burn severity map is produced by adjusting the BARC map as necessary.

Table 1. Definitions of Terms Commonly used in Soil and Watershed Burned Area Assessments.

Term	Definition
Fire Intensity	Rating based on temperature, flame length, rate of spread, heat of combustion and total amount and size of fuel consumed. Accounts for convective heat rising into the atmosphere and fire effects to the overstory.
Fire Severity	Rating based on temperature, moisture content of duff and fuels lying on the ground, heat of combustion of conductive and radiant heat penetrating into the soil and affecting soil characteristics.
Soil Burn Severity	Rating of fire impacts on soil productivity and erosion rate, and the potential for vegetation recovery. Burn severity is delineated on topographic maps as polygons. Classes of burn severity are High, Moderate, Low and Unburned.
Watershed Response	A qualitative evaluation of the amount of soil cover; amount and distribution of impermeable surfaces (rock outcrop, hydrophobic soils), and canopy conditions. Classes of watershed response are High, Moderate and Low.
X-year Storm Event	Rainfall occurring with a specific probability (1 in X chance) based on historical data. For example, the 10-year storm has a 1 in 10 (10%) chance of occurring in any given year, while the 100-year storm has a 1 in 100 (1%) chance of occurring in any given year.
X-year Flood	Stream discharge with a specific probability of occurring (1 in X chance) based on historical data. The 100-year flood may or may not occur as a result of a 100-year rainfall; the two are independent.

In some cases, there may be complete consumption of vegetation by fire, with little effect on soil properties. In general, denser pre-fire vegetation with a deeper litter and duff layer results in longer heat residence time, hence more severe effects on soil properties. For example, deep ash after a fire usually indicates a deeper litter and duff layer prior to the fire, which generally supports longer residence times. Increased residence time promotes the formation of water repellent layers at or near the soil surface, loss of soil organic matter, and loss of soil structural stability. The results are increased runoff and soil particle detachment by water and wind, and transport off-site.

Soil burn severity parameters include changes in litter and duff, loss of soil structure, destruction of fine and very fine roots in the surface horizon, and development of hydrophobic (water repellent) soil surfaces. Changes in litter/duff conditions as affected by the fire were noted and compared to pre-fire conditions. Water repellency was evaluated by determining if water repellency was present, and if so, the depth and thickness of the water repellent layer was noted.

Table 2. Acres of Soil Burn Severity Class by Fire

FIRE NAME	SOIL BURN SEVERITY	ACRES	PERCENT
Black Point	1-Unburned to Very Low	193	98.9
Basque Wells	2-Low	1.09	15.3
Black Point Total		195	100
Craters	3-Moderate	2.91	27.3
Basque Wells Total	2-Low	6.24	50.7

	3-Moderate	1,179	11
	4-High	224	2
Craters Total		10,766	100
Grandad	1-Unburned to Very Low	21,673	46.5
	2-Low	21,680	46.5
	3-Moderate	3,231	7
	4-High	10	<1
Grandad Total		46,595	100
Krumbo Butte	1-Unb to Very L	116	14.5
	2-Low	651	81
	3-Moderate	36	4.5
Krumbo Butte Total		804	100
Pueblo	1-Unburned to Very Low	12,713	18.6
	2-Low	36,804	53.9
	3-Moderate	18,716	27.4
	4-High	5	0.1
Pueblo Total		68,239	100
Trout Creek	1-Unburned to Very Low	312	25.8
	2-Low	732	60.6
	3-Moderate	163	13.6
Trout Creek Total		1,207	100
GRAND TOTAL		135,008	

2. Soil Erosion

Fire effects were evaluated in terms of soil condition parameters. These parameters included changes in litter and duff (vegetative ground cover), destruction of fine and very fine roots in the surface horizon, susceptibility to erosion, and development of hydrophobic (water repellent) soil surfaces. Changes in vegetative ground cover as affected by the fire were noted and compared to pre-fire conditions. Strength of surface soil structural aggregates was examined. Water repellency was evaluated by observing the depth and thickness of a water repellent horizon in surface soils where it existed, and the length of time a water drop remained beaded on the surface.

Soil survey information was used to help identify areas at risk from wind and water erosion and then evaluated with regards to soil burn severity. The soil survey indicated that the water and wind erosion for the soils within the burned areas range from Low to moderate, except for an estimated 6500 acres of high water erosion potential on the Pueblo Fire. Soil erosion will increase to some degree within the burn areas until the herbaceous vegetation recovers. The recommended treatment that will provide stabilization of the soil is seeding which is estimated to be needed on only 12% (10,900 acres) of the total acres burned. Other slope stabilization treatments are not being proposed due to the small amount of moderate soil burn severity. Steep, inaccessible slopes make other treatments infeasible.

3. Watershed Response

On-the-ground field observations and aerial reconnaissance within and downstream of the burn areas were conducted to determine watershed response. Channel morphology related to transport and deposition processes were noted, along with channel crossings and stream outlets. Observations included condition of riparian vegetation and the volume of sediment stored in channels and on slopes that could be mobilized. Burn severity and changes in soil infiltration were also considered.

The major determining factor influencing runoff and erosion from burned hillslopes is the amount of disturbance to the forest floor that protects the underlying mineral soil (Robichaud 2000). The unburned forest floor consists of a litter layer (leaves, needles, fine twigs, bark flakes, matted dead grass, mosses and lichens, O1 soil horizon) and a

duff layer (partially decomposed remnants of the material in the litter layer, O2 soil horizon) (Martin and Moody 2001). These layers absorb most of the rainfall, provide storage of water and obstruct the flow of water on hillslopes. The combustion process converts the forest floor into ash and charcoal. Ash and small soil particles seal soil pores (Morin and Banyamini 1977, Neary et al. 1999), decreasing the infiltration rate (Fuller et al. 1995, Barfield et al. 1981) and increasing potential runoff and erosion. When the charcoal and ash are removed from the hillslope by post-fire runoff or wind, the soil is left bare and susceptible to rain splash and overland flow. Although less litter, duff, and vegetation is present in the desert than in a forested environment, the same processes occur. However, the differences in infiltration and overland flow between pre-fire and post-fire conditions are less in a desert environment than in a forest because there is less ground fuel to burn in the desert.

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 follows a myriad of interlinking flow paths that constantly change as organic material (litter and duff layers) and inorganic material (rock) are encountered (Huggins and Burney 1982). Consumption of the forest floor by fire alters the path of overland flow by reducing the overall length of the flow path, resulting in the concentration of flow into a shorter flow path. This concentration of overland flow increases the hydraulic energy of the flow and can result in rill erosion. At the watershed scale, the reduction of hillslope flow path lengths and the formation of rills that have a high water conveyance capacity reduce the times of concentration or the amount of time for overland flow to reach a defined point within the watershed.

Overland flow is also influenced by the fire induced water repellency (hydrophobicity) of the soils. The reduction of infiltration due to water repellency can increase overland flow (DeBano et al. 1967). Infiltration curves for water repellent soils reflect increasing wettability over time once the soil is placed in contact with water. Water repellency decreases (hence infiltration increases) with time because the hydrophobic substances responsible for hydrophobicity are slightly water soluble and slowly dissolve, thereby increasing wettability. In general, hydrophobicity is broken up or is sufficiently washed away within one to two years after a fire (Robichaud, 2000).

Raindrops striking exposed mineral soil with sufficient force can dislodge soil particles and small aggregates. 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, 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) the management of the soil that makes it less susceptible to erosion (Foster 1982, Megahan 1986).

C. Findings

Basque Wells Fire

The watershed group assessed the 7,202 acres Basque Wells Fire on September 2, 2006 by aerial reconnaissance to determine threats to human life or property from fire effects resulting in increased runoff, erosion or dust. This was followed by a field visit on September 4th. The Basque Wells fire lies adjacent to the southwest shore of Harney Lake. Soil burn severity mapping indicates 77.4% of the burn to be low, 7.3% moderate, with the remaining 15.3% to be very low or unburned. Soil erosion hazards for this area are slight, although the soil appeared to be fine-grained, perhaps remnants of an ancient lake bed. No defined channels were noted; drainages are ephemeral within the burn area. No increase in watershed response is expected. Prevailing winds are southwesterly; wind erosion may slightly increase blowing ash and dust until vegetation recovers. Suppression forces used the Malheur National Wildlife Refuge access road into the fire, and the watershed group observed ruts and holes in the shoulder of the road along the shores of Harney Lake.

Values at Risk:

Human Health & Safety: No threats to human life or safety from watershed response to the fire were identified.

Soil/Watershed Stabilization: Slight soil erosion may occur due to wind and water erosion until vegetation recovers.

T&E Habitat Stabilization/Recovery: No findings for this category

Cultural Heritage Resources: No findings for this category

Invasive Plants: No findings for this category

Black Point Fire

The Bureau of Land Management administers the area where the 195 acre Black Point Fire burned, did not indicate any issues or concerns pertaining to watershed issues for this fire. Consequently, the watershed group did not complete aerial or field reconnaissance. Map reviews indicated no surface water drainages in the area. Soil burn severity mapping indicates 1.1% to be low severity and the remaining 98.9% to be unburned or very low severity.

Values at Risk:

Human Health & Safety: No findings for this category

Soil/Watershed Stabilization: No findings for this category.

T&E Habitat Stabilization/Recovery: No findings for this category

Cultural Heritage Resources: No findings for this category

Invasive Plants; No findings for this category

Craters Fire

The watershed group assessed the 10,767 acre Craters Fire on September 4, 2006 by a field reconnaissance to determine threats to human life or property from fire effects resulting in increased runoff, erosion or dust. The Craters Fire lies adjacent to and within the Malheur National Wildlife Refuge and Diamond Craters geologic area. Soil burn severity mapping indicate 60% of the fire to be low, 11% moderate, 2% high, with the remaining 27% to be very low or unburned. The majority of the soils within the fire area range from very deep to very shallow and are located on basalt flows, rock outcrop, pressure ridges, hills and tablelands. Erosion potential for both water and wind is low to medium. There are no perennial streams in the fire area however, one intermittent stream does occur, Diamond Creek. This stream flows from south to north through the western portion of the fire area and eventually enters the Blitzen River. The topography is very flat therefore; no increase in watershed response is expected. Prevailing winds are southwesterly; wind erosion may slightly increase blowing ash and dust until vegetation recovers.

Values at Risk:

Human Health & Safety: No findings for this category.

Soil/Watershed Stabilization: Slight soil erosion may occur due to wind and water erosion until vegetation recovers.

T&E Habitat Stabilization/Recovery: No findings for this category.

Cultural Heritage Resources: No findings for this category.

Invasive Plants: No findings for this category.

Grandad Fire

The watershed group assessed the 46,595 acre Grandad Fire on September 1 and September 7, 2006 by aerial reconnaissance to determine threats to human life or property from fire effects manifested in increased runoff, erosion or dust. This was followed by field visits on September 3rd, 4th, and 7th. The Grandad Fire lies adjacent to and within the Malheur National Wildlife Refuge. The Blitzen River is just outside the western fire boundary. Soil burn severity mapping indicates 47% of the fire to be low, 7% moderate, with the remaining 46% to be very low or unburned. Soils within the fire area range from very deep to shallow and are located on hills, pediments, mountainsides, fan terraces, old lake terraces, alluvial fans and tablelands. Erosion potential for both water and wind is medium to low. Prevailing winds are southwesterly; wind erosion may result in a significant increase in blowing ash and dust until vegetation recovers. Flushes of ash and sediment may occur during the first year following the fire. Bridge and Mud Creeks are the only perennial streams in the fire area and are tributaries to the Blitzen River after flowing through the East Canal. Both of these drainages have several ephemeral tributary streams within the burn area. The elevations of the burned areas range from 4255 to 7185 feet asl. The majority of the

moderate burn severity occurred in the higher elevations of Bridge Creek watershed and near the mouth of Mud Creek.

Because most of the burned vegetation was shrub and grass and not trees, the fire will have only minor effects to rain on snow runoff. Such events will continue to occur but the fire will not change the intensity or frequency of rain on snow runoff. The overall relative water yield increase due to the fire is expected to be minor and not exacerbate flooding events from spring snowmelt. The fire will only slightly increase surface runoff and stream flows generated from intense spring and summer rain storms over the Bridge Creek watershed. Flows will remain within the normal range of peak flows so risk of flooding from fire effects is minimal. Detailed peak flow predictions can be found in the project file.

Values at Risk:

Human Health & Safety: No findings for this category.

Soil/Watershed Stabilization: Soil erosion may occur due to wind and water erosion until vegetation recovers. Initial flushes of ash and sediment from Mud and Bridge Creek may result in the need for additional monitoring and cleaning of irrigation infrastructure. Localized increases in sediment delivery below moderate burn severity areas will result in filling of existing catchment basins.

T&E Habitat Stabilization/Recovery: No findings for this category.

Cultural Heritage Resources: No findings for this category.

Invasive Plants: No findings for this category.

Krumbo Butte Fire

The 804 acre Krumbo Butte Fire was assessed September 2, 2006 by aerial reconnaissance by the vegetation group. Riparian vegetation along Krumbo Creek and an unnamed drainage was unburned and intact and will filter any effects from the fire. Soil burn severity mapping indicates 81% of the burn area is of low severity, 4.5% of the area is moderate, and the remaining 14.5% is unburned. No off-site or downstream effects are expected.

Values at Risk:

Human Health & Safety: No findings for this category

Soil/Watershed Stabilization: No findings for this category

T&E Habitat Stabilization/Recovery: No findings for this category

Cultural Heritage Resources: No findings for this category

Invasive Plants: No findings for this category

Pueblo Fire

A rapid assessment of the 68,240 acre Pueblo Fire for threats to life, property, and critical natural resources within and downstream of the fire was conducted by aerial reconnaissance on September 1, 2006 and was followed by several field visits to the burned area on September 2 and 7, 2006. Roads, residential and commercial structures were evaluated for risk from increased erosion, flooding or debris flows. Several building sites in Fields, Oregon lie downstream of this fire. Rain-on-snow weather events impact this burn area and as recently as April, 2006, such an event produced a flood that inundated structures of the town. Fields Creek takes several sharp bends immediately upstream of these structures and has a heavy willow cover; these characteristics can affect flooding risk. Culverts in segments of Highway 205 (Fields-Denio, Long Hollow and Catlow Valley) and East Steens Road are undersized, and many are filled with sediment. The Catlow Valley Road segment lies immediately adjacent to the creek within Long Hollow Canyon. Observations of Long Hollow Creek suggest the channel does not have enough capacity to handle pre-fire peak flows. Inputs from the burned watersheds of Pearl Wise and Bradley Lake compound stream flows of Long Hollow Creek. Small drainages flowing into Skull Creek Reservoir will experience increased runoff from large areas of moderate burn severity and may contribute sediment to the reservoir displacing water and diminishing its capacity. Much of the Skull Creek watershed did not burn so runoff is ameliorated by the time outflows reach Highway 205. The bridge over Skull Creek should handle any increase in flows. With assistance of the BAER archeologist, cultural sites were located and assessed for risk of erosion and flooding. Soil burn severity mapping show less than 0.1% of the burned area is high, 27% area is

moderate, 54% low severity with the remaining 19% of the area within the burn perimeter to be unburned or of very low severity. The elevations of the burned areas range from 4950 to 7175 feet asl. The majority of the moderate burn severity occurred in the steep higher elevations of the Fields, Long Hollow, and Skull Creek watersheds.

Due to the high elevations of watersheds in this area, and because most of the vegetation lost was shrub, the fire will have minimal effects to rain on snow events. Such events will continue to occur but the fire will not change the intensity or frequency. The fire will increase surface runoff and streamflows generated from intense spring and summer rain storms over the watersheds. As a result, risk of flooding is high at the lower elevations below the burned areas during and immediately following rain storms. Risk is highest for Fields Creek, Long Hollow Creek, Pearl Wise Creek, and the watersheds draining into Skull Creek Reservoir. Detailed peak flow predictions can be found in the project file.

Values at Risk:

Human Health & Safety: The community of Fields, Oregon is at high risk from flooding during intense storm events and rain on snow events. Federal, County and private roads are at risk of flooding or being inundated with dead vegetation, sediment, and rock during intense storm events and rain on snow events. These risks existed pre-fire; however, post-fire conditions have increased these risks during certain storm events.

Soil/Watershed Stabilization: Soil erosion may occur due to wind and water erosion until vegetation recovers.

T&E Habitat Stabilization/Recovery: No findings for this category

Cultural Heritage Resources: No findings for this category

Invasive Plants: No findings for this category

Trout Creek Fire

The Bureau of Land Management, which administers the area where the 1207 acre Trout Creek Fire burned, did not indicate any issues or concerns pertaining to watershed issues for this fire. The watershed group did not complete aerial or field reconnaissance. Review of maps indicated no surface water drainages in the area. Soil burn severity mapping indicates 60% of the burn area is of low severity, 13% of the area is moderate, and the remaining 26% is unburned.

Values at Risk:

Human Health & Safety: No findings for this category

Soil/Watershed Stabilization: Slight soil erosion may occur due to wind and water erosion until vegetation recovers.

T&E Habitat Stabilization/Recovery: No findings for this category

Cultural Heritage Resources: No findings for this category

Invasive Plants: No findings for this category

IV. RECOMMENDATIONS

Based on the results of the above observations:

B. Emergency Stabilization – Fire Suppression Repair

Rock the refuge road on Basque Wells fire: To restore the road surface from impacts of suppression activities, rock needs to be placed in disturbed road sites. Several ephemeral drainages cross this road and drain into Harney Lake. Use along this road has resulted in ruts and holes in the narrow shoulder. There is a safety risk to vehicles passing over this stretch of road. Pit run rock should be placed to armor the road surface and reinforce the shoulder.

C. Emergency Stabilization

1. Human Health & Safety

Early Warning System BLM #13, Pueblo Fire

Increased risk of flooding in Fields and Long Hollow Drainage due to moderate and high soil burn severity of the Pueblo Fire places public safety and human lives at risk. The early warning system will potentially save lives by providing

communities and travelers downstream of the Pueblo fire with greater lead time to evacuate the area in the event of an extreme flood event. The project file contains information on predicted peak flows for these watersheds.

Catchment Basin Design BLM #16, Pueblo Fire

Increased risk of flooding is expected in Fields as a result of the moderate and high soil burn severity. Assessment of need, feasibility and design by a professional engineer for 5 identified water and debris catchment basins is needed for protection of public health and safety should occur.

Catchment Basin Cleanout BLM #14, Pueblo and Grandad Fires

Constructed catchment basins that are within or downstream from moderate and high soil burn severity areas of Grandad and Pueblo Fires are trapping sediment in the upper watersheds and protecting downstream resources. These need to be cleared of sediment to increase capacity prior to the first damaging rain event. Following storm events, these structures may need to be cleaned again.

2. Soil/Watershed Stabilization

Debris Removal FWS Spec#12, Grandad Fire

Normal high flow events on the refuge create a maintenance problem for operation of existing water diversions and fish screens. It is anticipated that there will be slightly higher than normal high flow events with increased sediment and coarse woody debris loadings to the refuge as a result of the Grandad Fire. Increased maintenance activities and more frequent patrols of the refuge system during rising hydrograph are proposed to prevent blockage of 25 instream structures and potential damage to facilities. Maintenance activities will include cleaning inlets and outlets of diversions structures using current methods (grapples, trash rakes, backhoe), cleaning of vertical fish screens of debris and inline horizontal fish screens of sediment.

Post Flood Road Clean-Up BLM Spec#15, Pueblo Fire

During major storm events, low-water crossings and other sections of roadways can be expected to flood. Flood events may erode road crossings or deposit sediment and debris on the roadway, making the road impassible and unsafe for vehicle travel. This specification provides for the clearing of sediment and debris from BLM roadways following major runoff events. Use heavy equipment to clear debris and sediment from 18 miles of roadways within the Pueblo Fire after major runoff events. Deposit any removed debris out of the floodplain on high ground to prevent its transport back into channels and onto the roadway.

3. T&E Habitat Stabilization/Recovery

No recommendation under this category

i. Cultural Heritage Resources

No recommendation under this category

ii. Invasive Plants

No recommendation under this category

E. Rehabilitation

No recommendation under this category.

F. Management Recommendations – Non-Specification Related

a. Install flash flood warning signs: Flood hazard warning signs should be installed immediately on the Catlow county road entering Long Hollow drainage, Highway 205 Fields and Denio segments, and East Steens Road within the burned areas and where streams cross roads downstream of burned areas for the protection of life and property. These signs are necessary to inform the public of immediate danger posed by flash floods generated by storm events. An initial site tour would identify additional locations of signs beyond those sites identified and any signs that need replacement. Signs

damaged by vandalism should be replaced during the first three years following the fires until vegetation recovers.

b. *Flood protection around private homes and structures:* Consult with NRCS for clean out of vegetation and debris from the lower segment of Fields Creek, directly above Fields Station, to increase carrying capacity of the channel. Replace and upgrade culverts in the county road and county frontage road directly in front of Fields Station. Place K-rails behind the Fields Station buildings to deflect flood waters.

c. *Clean out of existing reservoirs and catchment basins on private lands:* Private landowners should consult with NRCS about increasing holding capacity and decreasing surface runoff into Long Hollow Creek and Skull Creek watersheds, clean-out/maintain existing reservoirs and waterholes below hillslopes with moderate burn severity. Drawing down the water level in Skull Creek Reservoir should be considered to increase capacity before storm and snowmelt runoff.

d. *Construct catchment basin on private land:* Consult with NRCS for feasibility and design of new catchment basin(s) upstream of Fields, Oregon within the Fields watershed and at the mouth of Pearl Wise Creek to intercept surface runoff, delay time to peak, and reduce flow volume that may flood private homes and buildings in the town of Fields and Hwy. 205.

e. *Clean out culverts along county roads:* Remove sand, soil and debris within existing culverts along East Steens and Catlow Valley county roads. This will increase their carrying capacity during peak flows and reduce risk of culvert failure. Maintenance patrols should be increased after storm events that produce high flows to check for failed and plugged culverts.

f. *Provide for an engineer study for East Canal Road:* Contract for an engineering study for the East Canal Road on the Malheur National Wildlife Refuge. The study should identify feasibility, design and location for low water crossings or rolling dips to serve as relief spots for high water to overtop the road while protecting the road surface and allowing passage.

g. *Restore natural spring process at Knox Spring:* Remove the flume crossing East Canal to reduce trapping of debris in East Canal on the Malheur National Wildlife Refuge. Close the intake for the water pipe at the spring and allow natural flow of water to return to its past drainage. This will encourage riparian vegetation to re-establish in this drainage and provide an increase in this ecotype.

V. CONSULTATIONS

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BURNED AREA EMERGENCY STABILIZATION PLAN
SOUTH END COMPLEX, BASQUE WELLS & CRATERS FIRES
VEGETATION and RANGE RESOURCES ASSESSMENT

I. OBJECTIVES

- Evaluate and assess fire and suppression impacts to vegetative resources
- Determine emergency stabilization and monitoring needs supported by specifications to aid in vegetative recovery
- Evaluate the potential for invasive plant species to encroach into native plant communities within the fire area and determine stabilization and monitoring needs to mitigate encroachment

II. ISSUES

- Short and long-term effects of the fire and suppression activities on plant communities and vegetative resources.
- Potential for invasion of impacted lands by non-native invasive plant species.
- Management strategies which provide for the natural recovery and re-vegetation of impacted areas including the establishment of rangeland seeding to increase effectiveness of reducing future wildland fire size and cost.
- Protection and enhancement of other resource values including site productivity, wildlife habitat, including T & E species, vegetative resources, wilderness values

III. OBSERVATIONS

This report addresses known and potential impacts to vegetative resources on Bureau of Land Management and U.S. Fish and Wildlife administered lands within the fires. Findings and recommendations contained in this assessment are based upon information obtained from personal interviews and meetings with staff from the Bureau of Land Management- Burns Field Office, Malheur National Wildlife Refuge, Natural Resources Conservation Service (NRCS), Burned Area Emergency Response (BAER) team specialists, literature reviews, previous emergency stabilization plans and air and field reconnaissance of the fire area.

Recommendations for re-vegetation seed mixes were developed through consultation with vegetation specialists from the BLM and FWS and this information was provided to the BAER Team.

A. Background

VEGETATION TYPES

The following vegetative resources have significant physical and biological value to protect soils, stabilize watersheds, provide wildlife habitat, scenic value, and forage for livestock and wild horses.

1. Mixed Salt Desert Scrub (*Sarcobatus*, *Chrysothamnus* Shrub Communities)

A. Intermountain Basins Greasewood Flat

Less than one percent of the total area burned was dominated by Salt Desert Plant Communities. Black greasewood (*Sarcobatus vermiculatis*) is typically the dominant shrubby plant on these areas. It is considered distinct from salt desert scrub communities, but often occurs on saline soils and around playas. This vegetation type was found primarily on the Craters and Basque Wells fires. Periodic burning was rare in these communities prior to the introduction of cheatgrass and other annual plants. Currently, introduced annual plants fill interspaces between the shrubs and increased the fuel continuity on the site. Fires burn more readily than before introduction of the annuals. Many of the plants that occur in these plant communities are not adapted to periodic burning. The black greasewood plant communities are often transition areas from playas to lower elevation Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) plant communities. Because it is a transition area there are often components of both sagebrush and salt desert plant communities scattered throughout. Other shrubs that may be found in the black greasewood plant communities are shadscale (*Atriplex confertifolia*), bud sage (*Picrothamnus desertorum*), spiny hopsage (*Grayia spinosa*) and fourwing saltbrush (*Atriplex canescens*). Saltgrass (*Distichlis spicata*) is the dominant grass in these communities. Other grasses may included Indian ricegrass (*Achnatherum hymenoides*), basin wildrye (*Leymus cinereus*), and bottlebrush squirreltail (*Elymus elymoides*).

2. Sagebrush Dominated Communities

Sagebrush (*Artemisia* sp.) dominates a majority of the plant communities within the fire perimeters. Introduced annual plants and western juniper have encroached into portions of the area prior to burning. However, sagebrush still dominates the plant communities across 77% of the area prior to burning.

A. Wyoming and Basin Big Sagebrush Plant communities

This type is dominated by basin big sagebrush (*Artemisia tridentata* var. *tridentata*) or Wyoming big sagebrush (*Artemisia tridentata* var. *wyomingensis*). Other shrubs that are present but not dominant include rubber rabbitbrush (*Ericameria nauseosa*), green rabbitbrush (*Chrysothamnus viscidiflorus*) antelope bitterbrush (*Purshia tridentata*), spineless horsebrush (*Tetradymia canescens*) and black greasewood (*Sarcobatus vermiculatis*). Perennial herbaceous species make up less than 25% cover. Grass Species include bluebunch wheatgrass (*Pseudoroegneria spicata*), Thurber's needlegrass (*Achnatherum thurberianum*), Sandberg's bluegrass (*Poa secunda*), basin wildrye (*Leymus cinereus*), bottlebrush squirreltail and western wheatgrass (*Pascopyrum smithii*). Creeping wild rye often fills this niche here. These sagebrush plant communities occupy the drier end of the sagebrush distribution across the Burns District. Cheatgrass (*Bromus tectorum*) has established, and now dominates the herbaceous vegetation, in large areas of these plant communities.

B. Mountain Big Sagebrush Plant Communities

Big sagebrush plant communities above approximately 5,000 feet are dominated by mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*). These sagebrush plant communities are some of the most productive plant communities within the Burns District. A number of other shrubs are often found with in the mountain big sagebrush plant communities. The most common shrubs associated with mountain big sagebrush are antelope bitterbrush, mountain snowberry (*Symphoricarpus oreophilus*), wax currant (*Ribes cereum*), green rabbitbrush, and snowbrush ceanothus (*Ceanothus velutinus*). Bluebunch wheatgrass, Idaho fescue (*Festuca idahoensis*), Thurber's needlegrass, western needlegrass (*Achnatherum occidentale*), Sandberg's bluegrass, and junegrass (*Koeleria macrantha*) are the dominant grasses. Fires historically burned more frequently in these areas than in the lower elevation sagebrush and low sagebrush plant communities. Fire return intervals varied from less than 20 years to over 35 years. Historic fires that burned through these plant communities were either fuel or wind-driven events.

Western juniper (*Juniperus occidentalis*) has increased dramatically within the mountain big sagebrush plant communities. The expansion of western juniper has occurred at the expense of the associated woody vegetation. On deeper soils western juniper will reduce the mountain big sagebrush and other shrub cover to less than 2%. Herbaceous vegetation is not as dramatically affected as the shrubs which are affected first. Herbaceous plant cover will decline to slightly higher than pre-western juniper encroachment levels. However, on deeper soils western juniper will reduce all associated plant cover to less than 5%.

C. Low Sagebrush Plant Communities

Low sagebrush (*Artemisia arbuscula*) plant communities are found on shallow soils or soils with a heavy clay layer within 16 inches of the soil surface. Less than 25% of the total area burned by the fires were low sagebrush plant communities. Antelope bitterbrush, rubber rabbitbrush, and green rabbitbrush often found in association with low sagebrush. These larger shrubs are often found on slightly deeper soil islands within the low sagebrush plant community. Herbaceous vegetation is similar to the neighboring Wyoming or mountain big sagebrush plant communities. Sandberg's bluegrass, bluebunch wheatgrass, bottlebrush squirreltail and Idaho fescue are the dominant perennial grasses. Western juniper is also encroaching on low sagebrush plant communities. In many cases the encroaching western juniper is found in areas where no old western juniper trees had existed.

3. Quaking Aspen Woodlands

Quaking aspen (*Populus tremuloides*) is found on the higher elevations of the Burns District. Quaking aspen is often found in association with mountain big sagebrush or riparian plant communities. Soils are often deep and very productive. Areas where quaking aspen occurred made up about 3% of the total area burned. Quaking aspen plant communities usually respond very well to burning. Most of the plants sprout from subterranean structures that survive the fire. The vegetation occurs in a multilayered mixture of shrubs, forbs, and grasses. Common grasses are bluebunch wheatgrass, western needlegrass, basin wildrye, and mountain brome (*Bromus marginatus*). Forbs include *Thalicturm* sp., geranium, bedstraw (*Galium* sp.), peavine (*Vicia* sp.), and yarrow (*Achillia millefolium*).

4. Riparian and Wetlands

Less than 1% of the burned area were classified as riparian vegetation. However, these areas are extremely important to the overall ecology of the Burns District. Fire is a rare event in riparian areas due to the abundance of surface and subsurface water. When burned the effects can be dramatic. Woody vegetation within the riparian areas was dominated by willow (*Salix* sp.), and red alder (*Alnus rubra*). *cocarpus ledifolius*). It occurs on rocky sites where it is protected from fire. Common co-occurring shrub components include sagebrush (*Artemisia tridentata*), snowberry (*Symphoricarpos* spp.), Antelope bitterbrush (*Purshia tridentata*), and gooseberry (*Ribes* spp.). Few areas were dominated by black cottonwood (*Populus balsamifera*).

6. Herbaceous Communities

A. Invasive Annual Grassland

This type is dominated by exotic annual grasses such as cheatgrass (*Bromus tectorum*). Areas dominated by cheatgrass occur on previously burned areas that were not reseeded following the burn.

C. Introduced Perennial Grassland

This type consists of perennial grasses of non-native origin, including Crested wheatgrass (*Agropyron cristatum*). The majority of these areas were once dominated by Wyoming or basin big sagebrush. On many of the seedings, Wyoming sagebrush is re-establishing itself.

The following Table summarizes the major vegetation types occurring within the burned area.

Table 1. Acres of Vegetation Types by Ownership by Fire

Fire Name	Vegetation Association	MNWR	BLM	Private	Grand Total
Basque Wells	Mixed Salt Desert Scrub	4	531		535
	Other	358	0		358
	Sagebrush Dominated Communities	8	5,909	392	4,414
Total		370	6,440	392	7,201
Black Point	Sagebrush Dominated Communities		38		38
	Mixed Salt Desert Scrub		157		157
Total			195		195

Craters	Sagebrush Dominated Communities	9	4,180	408	4,596
	Riparian and Wetlands	3	8	40	51
	Other (rock outcrops, lava beds)	2,042	3,867	210	6,120
Total		2,054	8,055	657	10,767
Grandad	Quaking Aspen Woodlands		4,433	7,471	11,904
	Sagebrush Dominated Communities	1,442	28,203	4,946	34,590
	Other	92	7		100
Total		1,535	32,643	12,416	46,594
Krumbo Butte	Sagebrush Dominated Communities	211	525	69	804
Total		211	525	69	804
Pueblo	Sagebrush Dominated Communities		50,693	15,604	66,297
	Riparian and Wetlands		2	52	54
	Mixed Salt Desert Scrub		1,070	739	1,809
	Other		35	43	78
Total			51,801	16,438	68,239
Trout Creek	Sagebrush Dominated Communities		539		539
	Mixed Salt Desert Scrub		668		668
Total			1206.8		1,207
Grand Total		4,169	100,866	29,972	135,008

Range Resources

Consultation with staff from BLM-Burns District Office was conducted on range management issues.

The following table lists the allotments, AUMs, and fire impacts to the resources. Rangeland management staff provided the data for permittees and permitted AUMS impacted. Many of the permitted AUM's are potentially impacted due to the extent of the burns and existing rangeland projects, i.e., fencing and water sources.

Livestock grazing may be affected for several years in low elevation areas. Low average annual precipitation results in lengthy recovery time. In many areas of the mountain sagebrush zone at higher elevations with higher precipitation levels, recovery of burned areas would involve a natural vegetation response from seed or from an existing underground bed. In most of the low elevation Wyoming Sagebrush and low sagebrush communities with less healthy prefire

communities, seeding would be necessary to meet resource objectives and provide for invasive species control. To protect emerging vegetation, grazing would need to be deferred to allow for plant re-growth and re-establishment.

Grazing on allotments or portions of allotments that are within the burned area will be rested from grazing for at least 2 growing seasons or until establishment criteria are met based on rangeland monitoring. Specific vegetative objectives will be completed for the areas impacted by fires. Grazing allotment agreements or decisions will be handled on an allotment basis in order to meet vegetative objectives. Grazing may be permitted in order to meet objectives primarily to control and decrease the spread of invasive plant species during the “green up” period. Due to the extent of the fires and the vast variety of vegetative communities, ecological sites and resource concerns, burned area objectives may vary within and between fires.

BLM BURNS DISTRICT MANAGEMENT DIRECTION

Three Rivers Management Unit

Noxious weeds are present throughout the Three Rivers and Andrews planning units where disturbance has occurred. These noxious weeds are so thoroughly established and spreading so rapidly that they have been declared a menace to the public welfare (Oregon Revised Statute [ORS] 570.505). Noxious weed invasion contributes to the loss of rangeland productivity, increased soil erosion, reduced species and structural diversity, and loss of wildlife habitat. In some instances, such invasion is hazardous to human health and welfare, as emphasized in the Federal Noxious Weed Act (PL 93-629). The Carlson-Foley Act (PL 90-583), as well as state and county laws, make the federal government responsible for control of weeds on public land and provide direction for their control. The Burns District Office of the BLM operates under the weed protocols set forth in the following documents: Vegetation Treatment on BLM Lands in Thirteen Western States FEIS and ROD (USDI 1991), Supplement to the Northwest Area Noxious Weed Control Program FEIS and ROD (USDI 1987), and the Burns District Noxious Weed Management Program EA # OR-020-98-05 (USDI 1998a).

Other Management Direction:

Diamond Craters Management Actions – “Adopt a policy of letting natural fires burn within the ONA.”

Table 4. Allotments Impacted by the Fires

Allotment Name	Total Acres	Affected Acres	Affected Percentage
ALVORD PEAK ALLOT.	6,008	5,968	99.34%
CHIMNEY	24,947	150	0.60%
CM OTLEY FFR	10,130	7,714	76.15%
DRY LAKE	19,628	149	0.76%
EAST WARM SPRINGS	192,684	2,291	1.19%
FIELDS ALLOT.	24,084	16,688	69.29%
FIELDS BASIN	32,742	27,281	83.32%
FRAZIER FIELD	15,620	3,857	24.70%
HAMMOND	13,479	3,528	26.18%
HAMMOND FFR	4,759	3,249	68.26%
HARDIE SUMMER	9,783	8,502	86.91%
KRUMBO MOUNTAIN	17,359	10,570	60.89%
LILY LAKE EXCLOSURE	813	15	1.83%
LONG HOLLOW FFR	1,664	1,664	100.00%
MUD CREEK ALLOTMENT	8,246	8,246	100.00%
NORTHRUP FFR	2,599	707	27.22%
PUEBLO LONE MTN	224,240	2,393	1.07%
ROARING SPRINGS FFR	203,256	12,809	6.30%
ROCKY FORD	4,103	56	1.36%
RUBY SPRINGS ALLOT.	15,377	32	0.21%
SOUTH CATLOW ALLOT.	62,168	35	0.06%
STARR FFR	778	177	22.81%
TULE SPRINGS	149,484	1,641	1.10%
UNALLOTTED	1,878	0	0.00%
WEST WARM SPRINGS	303,653	4,552	1.50%

Andrews Management Unit

Desired Range Conditions: ... “a mosaic of multiple-aged shrubs, forbs and native perennial grasses. Shrub overstories are present in a variety of spatial arrangements and scales across the landscape level including large continuous blocks, disjunct islands and corridors. Plant communities not meeting DRC show upward trends in condition and structural diversity. New infestations of noxious weeds are not common across the landscape and existing large infestations are declining.”

Rangeland Goals

1. Maintain or restore or improve the integrity of desirable vegetation communities including perennial native, and desirable introduced plant species. Provide for their continued existence and normal function in nutrient, water and energy cycles.
2. Manage rangeland habitats so that forage, water, cover, structure and security necessary to meet the life history requirements of wildlife are available on public lands.
3. Control the introduction and proliferation of noxious weeds and reduce the extent and density of established populations to acceptable levels.

Rangeland Management Direction applicable to this BAER plan:

“Plant communities that do not meet DRC due to dominance by undesirable weedy species or invasive juniper will be rehabilitated utilizing native and non-native species where appropriate.”

“Noxious weed prevention and control will continue to be a priority. Weeds will be controlled in an integrated weed management program... Chemical treatments using approved herbicides will be applied where mechanical or biological controls are not feasible... Application will take place only in accordance with the manufacturer’s label and by qualified certified applicators.”

“Noxious weeds occurring in special management areas, including areas with T&E species/habitat, will be treated with methods to protect resource values and in accordance with provisions of the Burns District’s Integrated Management Program EA directing weed management.”

Grazing Management Goals

1. Manage for a sustained level of livestock grazing while maintaining healthy public land resources.

Grazing Management Direction applicable to this BAER Plan:

“Areas burned by wildland fire will be rested for a minimum of two growing seasons before being reopened to grazing, and then only when monitoring data support resumption of grazing. Rest for less than two growing seasons may be justified on a case-by-case basis, based upon resource data and plant community requirements.”

Other BLM Management direction:

“Stabilization and Rehabilitation activities will follow current BLM regulations and guidelines (Departmental Manual 620 DM 3). Selection of stabilization and rehabilitation methods will occur after site-specific analysis and follow the Interagency Burned Area Stabilization and Rehabilitation Handbook.”

“...A mixture of native and introduced plant species will be considered for stabilization and rehabilitation projects based on analysis of site-specific conditions and species availability.”

MALHEUR NATIONAL WILDLIFE REFUGE MANAGEMENT DIRECTION

Direction for management of vegetation after a fire on the Malheur National Wildlife Refuge is not clear.

Plans in place that have direction applicable to this BAER plan include:

1. Malheur National Wildlife Refuge Master Plan signed September 10, 1985
2. Blitzen Valley Management Plan signed November 11, 1990
3. Fire Management Plan signed on May 8, 2001

The FONSI of the 1985 Malheur National Wildlife Refuge Master plan states that “Habitat management will emphasize, where practical, the use of natural ecological processes such as drought-flood cycles, prescribed fire, and grazing rather than intensive management through manipulative practices such as storage reservoirs, irrigation wells, and pesticides.”

The 1990 Blitzen Valley Management Plan states “Guidance and control of noxious weeds is provided by a plan titled ‘Integrated Pest Management of Noxious Weeds at the Malheur National Wildlife Refuge, Burns, Oregon’. The preferred alternative in this plan and environmental assessment, stresses ‘ecologically sound land management practices based on long-term effectiveness, minimal ecological disturbance, and a minimum hazard to non-target organisms.’ Land management practices will utilize physical, cultural, and chemical control to manipulate the environment to the pest organism’s disadvantage. The decision to control or not to control will be based upon conflicts with refuge objectives and legal obligations.”

The 2001 Fire Management Plan states in the Rehabilitation and Restoration section “If revegetation or seeding is necessary, only native species will be used.”

Invasive Species

Many non-native invasive plants are widespread throughout this region of the state.

This complex of fires has provided a window of opportunity for the further encroachment of non-native invasive plants, such as perennial pepperweed (*Lepidium latifolia*) and especially, cheatgrass (*Bromus tectorum*). Cheat grass has increased across the western U.S. over the past 80 years. The primary increase has occurred in the drier end of the sagebrush steppe. Cheatgrass dominated communities have shallow root systems that increase erosion potential and decrease watershed health and function; provide low nutritional value for wildlife and domestic livestock; negatively impact critical habitat; and create areas of fine flashy fuels that increase fire frequencies.

A number of other annuals have also been introduced to the area. These plants do not often dominate the plant community, but can be a significant component following disturbance. Introduced annuals utilize resources (water and nutrients) prior to recovering native perennial species. If this dominance continues, annuals will displace the perennials.

B. Reconnaissance Methodology and Results

On Friday, September 1, 2006, a meeting was held with the District Manager and BLM and MNWR staff to identify issues and to determine the focus for conducting the vegetation and range management resource assessment. Information on vegetation, invasive plants, possible seeding strategies, and other resources were obtained from specialists from BLM-Burns Range Conservationists and Fire Ecologists and from Malheur National Wildlife Refuge specialists.

On Saturday, September 2, the BAER vegetation specialists flew the Pueblo, Granddad and Krumbo Butte fires with BLM Range Conservationists. Over the next four days the BAER vegetation specialists visited the Granddad, Pueblo, Craters and Basque Wells Fires with BLM staff and a MNWR biologist to examine mortality levels, to discuss natural revegetation in the sagebrush and other vegetation types, natural regeneration in riparian types and potential seeding areas, methods and mixes.

Burned Area Reflectance Classification (BARC) data was acquired and modified to show above ground vegetation mortality levels. Vegetation mortality was classified into four categories; Low (<25% mortality), Moderate Low (25%-50% Mortality), Moderate High (51%-75% Mortality) and High (>76% Mortality). Reclassification of the BARC data was using the post-fire image for the initial classification and then truthing that with photos of specific areas within each fire. The final step was a review by BLM staff who were familiar with the fires.

Vegetation mortality refers to immediate post fire mortality of the above-soil plant parts. It does not imply that the vegetation will not re-leaf or re-sprout from root crowns or epicormic plant parts. Long-term mortality or recovery will occur according to specific plant physiological characteristics, degree of injury, climatic conditions and the presence or absence of other post-fire damaging agents such as animals and insects.

On September 5, 2006, BLM and MNWR specialists sat with BAER specialists to identify and place on a map, treatment boundaries for seeding, boundary fence replacement, temporary fencing and invasive species control. These items were then digitized and acres of treatment or miles of treatment were calculated for use in the assessments and specifications.

Specifications and the assessment were reviewed and comments provided by BLM and MNWR specialists on September 11.

C. Findings

Vegetation Mortality

In many Great Basin ecosystems, pre-fire vegetation was generally dependent on the seral stage of the plant communities dominated by sagebrush. The BAER Team observed most of the heavier fuel loading occurred in draws and aspects that favored more water availability. On lower sites that still had sagebrush, the fuels were lighter and where both perennial grass and annual fuels that burned very quickly with low to moderate soil burn severity.

Vegetation mortality classification parameters include degree of consumption of herbaceous, shrub, and forest vegetation communities, and effects of the fire on the regeneration potential of the affected vegetation species.

Table 2. Above-Ground Vegetation Mortality Levels by Fire and Ownership

Krumbo Butte Fire				
Mortality Level	MNWR	BLM	Private	Grand Total
Low (<25% Mortality)	16	52	12	80
Moderate Low (25%-50% Mortality)	14	47	15	76
Moderate High (50%-75% Mortality)	41	109	18	169
High (>75% Mortality)	140	317	23	479
Grand Total	211	525	69	804

Basque Wells Fire				
Mortality Level	MNWR	BLM	Private	Grand Total
Low (<25% Mortality)	103	677	20	799
Moderate Low (25%-50% Mortality)	50	927	55	1,032
Moderate High (50%-75% Mortality)	43	1,025	68	1,135
High (>75% Mortality)	174	3,812	248	4,235
Grand Total	370	6,440	392	7,201

Craters Fire				
Mortality Level	MNWR	BLM	Private	Grand Total
Low (<25% Mortality)	165	1579	189	1,933
Moderate Low (25%-50% Mortality)	64	281	46	391
Moderate High (50%-75% Mortality)	104	874	79	1,057
High (>75% Mortality)	1,721	5,322	343	7,386
Grand Total	2,054	8,055	657	10,767

Grandad Fire				
Mortality Level	MNWR	BLM	Private	Grand Total
Low (<25% Mortality)	52	13,527	5,053	18,632
Moderate Low (25%-50% Mortality)	51	2,950	1,908	4,909

Mortality)				
Moderate High (50%-75% Mortality)	204	3,209	1,045	4,458
High (>75% Mortality)	1,227	1,2958	4,410	18,595
Grand Total	1,535	32,644	12,416	46,595

Pueblo Fire				
Mortality Level	MNWR	BLM	Private	Grand Total
Low (<25% Mortality)	7,428	3,273	0	10,701
Moderate Low (25%-50% Mortality)	5,715	2,553	0	8,267
Moderate High (50%-75% Mortality)	6,417	3,118	0	9,535
High (>75% Mortality)	32,242	7,494	0	39,737
Grand Total	51,801	16,438	0	68,240

Sagebrush Dominated Communities

These vegetation communities sustained light to moderate soil burn severity with most of the acreage in high vegetation mortality. There was a small percentage of unburned or mosaic burn within this group. Approximately 93 percent of the burned area consisted of these community. Most of the perennial grasses within this type will respond to fire and some plants in low to moderate burn severity have shown signs of re-growth. Many islands of unburned vegetation will provide seed sources as wind dispersed species exist within this vegetation type.

Much of the Wyoming sagebrush zone is heavily invaded by cheatgrass whereas the mountain sagebrush zone is less invaded. The fire will convert these areas to cheat grass dominance without treatment.

Shrub Dominated Communities (Mountain Mahogany, Bitterbrush Dominated)

This vegetation community represents about 1 percent of the area within the burned area. The concern in this vegetation type will be the competition of non-native invasive annuals and perennial grasses that may have been present. Some of these shrub species respond to fire by re-sprouting such as serviceberry, and snowberry. However, some species such as bitterbrush and mountain mahogany are susceptible to fire kill and will not re-sprout.

Desert Scrub Species (Atriplex, Chrysothamnus Shrub Communities)

Most of these communities have open to moderately dense shrubs with herbaceous grass understories which normally have low burn severity; however, with a component of annual invasive species such as cheatgrass they are more susceptible to moderate burn severity with more fuel loading to carry fire.

Riparian

This vegetation group was primarily comprised of riparian shrubs such as several species of willow, red osier dogwood, chokecherry, narrow-leaf cottonwood, alder, birch and some aspen. Some of these riparian species are not tolerant of fire and in some cases were impacted by the fire. Impacts to the riparian areas were higher where the community was relatively narrow and the adjoining fuels were dominated by highly flammable sagebrush and perennial grass communities. This was the case in the lower drainages of Mud Creek and Bridge creek. Some riparian components were not impacted by fire as they were buffered by higher soil moisture and some surface water in the drainage they occupy.

Aspen Forests

This forest type contains the only tree form plants within very large landscapes of shrub dominated communities and is very important for landscape diversity in both physically and biologically. The community contains aspen of different size depending on recent disturbances such as fire, insects, weather related events, and livestock grazing. Aspen re-sprouts vigorously from fire and may grow as much as two feet per year. Aspen stands were primarily found in the Grandad Fire and generally fire severity in these stands was light.

Invasive Species:

Non-native Invasive Species

Known documented populations of non-native invasive species existed in the fire perimeters prior to burning. Populations near or below 5,000 feet in elevation are expected to increase dramatically, and especially in the case of cheat grass. Other species that are expected to increase are Canada thistle, medusahead, perennial pepperweed, leafy spurge and Russian knapweed, spotted knapweed, diffuse knapweed and also dalmation toadflax. Assessment and treatment of these invasive species is discussed below and in the specifications.

IV. RECOMMENDATIONS

A. Emergency Stabilization – BLM Specifications

Specification #3 - Ground Seeding

A specification has been prepared to seed with a drill vegetated sites that were burned with moderate to heavy above ground vegetation mortality. Drill seeding will be used to target areas with favorable access, soils and slope. Areas should also have limited rock and gentle terrain suitable for drill seeding. Ground seeding will be used to stabilize soils and re-vegetate sites to control the spread of invasive non-native species, within the sagebrush dominated communities and semi-desert grassland. Approximately 10,811 acres within the South End Complex, Basque Wells and Craters Fires will be seeded. Seeding will occur in late fall or early winter, when moisture occurs. Application will be by rangeland drill, pulled by either a farm tractor or dozer, and at seeding rate of 9 pounds per acre. If available, seed will be procured by the BLM National Business Center to control costs and insure seed quality, otherwise seed will be purchased directly. Lab tests will be conducted to certify as weed free. This specification meets the objectives as stated in the Delegation of Authority from the BLM Field Office.

Seed Mix for the South End Complex and Basque Wells & Crater Fires on BLM lands.

Mix	Acres	Species	Seed/ ft2	Seed/lb	PLS	PLS lb/ac	Price/lb	Bulk lb/ac	Total Bulk lbs	Total Cost
Mix 1	1,290	Basin Wildrye	5.00	130,000	0.85	2.0	\$ 4.00	2.4	3,035	\$ 12,141
		Bluebunch Wheatgrass	10.00	130,000	0.94	4.0	\$ 8.00	4.3	5,489	\$ 43,915
		Big Bluegrass	21.00	917,000	0.91	1.0	\$ 7.00	1.1	1,418	\$ 9,923
		Western Wheatgrass	7.00	120,000	0.92	3.0	\$ 8.00	3.3	4,207	\$ 33,652
Mix 2	9,521	Basin Wildrye	5.00	130,000	0.85	2.0	\$ 4.00	2.4	22,402	\$ 89,609
		Bluebunch Wheatgrass	8.00	130,000	0.94	3.0	\$ 8.00	3.2	30,386	\$ 243,089
		Crested Wheatgrass (Nordan)	9.00	200,000	0.94	2.0	\$ 1.75	2.1	20,257	\$ 35,451
		Siberian Wheatgrass	2.00	220,000	0.94	1.0	\$ 1.75	1.1	10,129	\$ 17,725
		Western Wheatgrass	5.00	120,000	0.92	2.0	\$ 8.00	2.2	20,698	\$ 165,583

Acres	Species	Total Bulk lbs	Total Cost
10,811	Basin Wildrye	25,438	\$ 101,751
10,811	Bluebunch Wheatgrass	35,876	\$ 287,004
1,290	Big Bluegrass	1,418	\$ 9,923
10,811	Western Wheatgrass	24,904	\$ 199,235
9,521	Crested Wheatgrass	20,257	\$ 35,451
9,521	Siberian Wheatgrass	10,129	\$ 17,725
Total		118,021	\$ 651,089

Specification #4 - Seeding Effectiveness Monitoring

A specification has been prepared to monitor the effects of stabilization treatments on vegetation communities within the fire perimeter of the South End Complex, Basque Wells, and Crater Fires. Vegetation transects will be established throughout the fire, in sagebrush dominated and grassland communities to determine whether artificial or natural seeding has been effective. Treatment effective monitoring will utilize the "Freqdens" Technique or similar methods established for seeded areas. Seeding will be considered successful if 2 to 3 plants per square meter are established or if a minimum of 3 to 5 native, perennial herbaceous plants per square meter establish. Sampling methodologies shall represent dominant plant community types, aspect, and slope variations within the seeded areas. Photo documentation shall accompany written documentation. Monitoring is also required to ascertain reseeding or native release success, noxious weed control or spread, insect infestations and to meet BLM National Standards.

Specification #5 - Noxious Weed Control-Herbicide/Manual

A specification has been prepared to control known infestations of listed noxious weeds within the fire perimeters of the South End Complex, Basque Wells and Crater Fires. Weed infestations consist of Canada thistle, medusahead, perennial pepperweed and cheat grass. Control will be by chemical herbicide and where necessary, by hand grubbing. Approximately 7,715 acres will be treated by truck mounted, backpack, or ATV mounted sprayers, or hand grubbed in accessible spots.

Specification #6 - Noxious Weed Detection

A specification has been prepared for detection of noxious weeds within the fire perimeter of the South End Complex, Basque Wells and Crater Fires. This will consist of monitoring known infestations of noxious weeds before the fire and survey disturbed areas within the fire perimeter to determine spread of weeds. Areas to be inventoried will be along roads, disturbed areas from suppression attempts and riparian areas. New infestations that are found will be documented with photos and will be GPS'd for location.

Specification #6 - Protective Fence Replacement

A specification has been prepared to reconstruct existing boundary fences between MNWR and BLM lands and between BLM and private lands to protect seeded burned areas from livestock. The specification proposes 40 miles of reconstructed fence. The fencing will be constructed to BLM standards. These fences will maintain burn area closures, protect critical habitat, and meet BLM objectives.

Specification #7 - Temporary Fencing

A specification has been prepared to construct temporary fence to protect seeded burned areas from livestock and wild horses. The specification proposes 28 miles of temporary fence. The fencing will be constructed to BLM standards. These fences will maintain burn area closures, protect critical habitat, and meet BLM objectives.

B. Emergency Stabilization – MNWR Specifications

Specification #2 – Ground Seeding

A specification has been prepared to seed with a rangeland drill seed 107 acres of burned vegetated sites within the Grandad Fire to re-establish native vegetation and to control the influx of invasive species including perennial pepperweed and cheat grass. A seed mix of only native species will be used.

Specification #3 - Seeding Effectiveness Monitoring

A specification has been written to monitor the effectiveness on 107 acres of the ground seeding to be accomplished on MNWR lands within the Grandad Fire.

Specification #4 - Noxious Weed Control-Herbicide/Manual

A specification has been prepared to control known infestations of listed noxious weeds within the fire perimeter of the South End Complex, Basque Wells, and Crater Fires. Weed infestations consist of Canada thistle, perennial pepperweed, medusahead and cheat grass. Approximately 3925 acres will be treated by truck mounted, backpack, or ATV mounted sprayers, or hand grubbed in accessible spots.

Specification #5 - Noxious Weed Detection

A specification has been prepared for detection of noxious weeds on 300 acres on MNWR lands within the fire perimeters. This will consist of monitoring known infestations of noxious weeds before the fire and survey disturbed areas within the fire perimeter to determine spread of weeds. Areas to be inventoried will be along roads, disturbed areas from suppression attempts and riparian areas. New infestations that are found will be documented with photos and will be GPS'd for location.

Specification #6 - Protective Fence Replacement

A specification has been prepared to reconstruct existing fence to protect seeded burned areas from livestock and wild horses. The specification proposes 11.5 miles of reconstructed fence. The fencing will be constructed to BLM standards. These fences will maintain burn area closures, protect critical habitat, and meet BLM objectives.

Specification #7 - Temporary Fencing

A specification has been prepared to construct temporary fence to protect seeded burned areas from livestock. The specification proposes 4.7 miles of temporary fence. The fencing will be constructed to BLM standards. These fences will maintain burn area closures, protect critical habitat, and meet BLM objectives.

C. Rehabilitation Recommendations (no specification)

The vegetation group was primarily focused on emergency stabilization issues although long-term rehabilitation projects were considered, such as reforestation and fencing. It is recommended that a rehabilitation plan be prepared to address identified issues such as interior fence repair, damaged range improvement repair and bitterbrush planting and to address other potential and as of yet unidentified issues.

D. Management Recommendations (non-specification related)

BLM Management plans

Current management plans for the Burns District were confusing, conflicting and greatly incomplete when trying to determine direction for emergency stabilization treatments, short-term and long-term management actions. It is recommended that the current plans be revisited, especially the Three Rivers Management Unit plan to update it and to make it consistent with the Andrews Management Unit plan.

MNWR Management Plans

The management plans for the Malhuer National Wildlife Refuge appeared to be re-signings of older plans and appeared to be out-of-date. There was no clear direction concerning the management of invasive species on FWS lands, on the use of herbicides to control existing and emerging invasive specie populations and in the use of non-native species to replant after a wildfire.

V. CONSULTATIONS

Resource Advisors that Assisted in Vegetation Resource Assessment for the BAER Team

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Specialists Consulted

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BURNED AREA EMERGENCY STABILIZATION AND REHABILITATION PLAN

SOUTH END COMPLEX & BASQUE WELLS AND CRATERS FIRES CULTURAL RESOURCE ASSESSMENT

I. OBJECTIVES

- Assess damages to known historic and prehistoric cultural resources as the result of fire behavior.
- Assess potential risks to known/documented cultural resources as the result of the fire (e.g. erosion, flooding, and exposure to looting and/or vandalism).

II. ISSUES

- Identify known/documented resources that have been subject to direct or indirect effects of fire.
- Identify emergency stabilization and/or protection needs for cultural resources within the fire.
- Other resources stabilization measures that may put cultural resources at risk.
- Consultation with appropriate parties to meet legal compliance and tribal consultation.

III. OBSERVATIONS

A. Background

Prehistoric Resources

Evidence of prehistoric use of the Harney Basin and Steens Mountain is abundant on both Bureau of Land Management (BLM) and US Fish and Wildlife Service (FWS) lands. The abundance of birds, animals and plants found within the Harney Basin and on Steens Mountain has provided the Native Americans of the area with abundant food and resources for over 11,000 years. Use of the area was greatly influenced by climatic changes, some lasting one or two centuries, which altered the range of plants across the basin and influenced wildlife and human use.

Archaeological evidence shows that people were using the area around 10,500 years ago (Pre-Archaic 10,500 – 8,000 BP), when the Harney Basin contained a huge lake that covered 255,000 acres. These early inhabitants used plants and animals found along the edge of this vast lake and other resources in the surrounding uplands and mountains.

A gradual warming trend around 7,000 years ago during the Early Archaic (8,000 – 4,500 BP) caused general aridity in the area and a drying of the large lakes found in the Great Basin. Use of the area increased around 6,000 years ago when the climate became wetter, resulting in expansion of lake and marsh resources at lower elevations and an increase in upland resource reliability. Native American use of the area included fishing for tui chub, suckers and squawfish, and the hunting of ducks, antelope, bighorn sheep, coyote, muskrat, mule deer, elk and bison.

At around 3,500 years ago, the Middle Archaic (5,000 – 1,250 BP), small villages began to appear along the edge of the lakes and along the Blitzen River. These sites include stone ring structures or house pits, and some are associated with rock art. Three sites excavated in the Blitzen River valley show increased use of marsh and river resources and a fairly stable way of life. At one of these early villages, rabbit, fish and large game animals (from the adjacent mountain areas) were being eaten; grass and juniper seeds were being harvested for food; and conifer and sage brush were being used to fuel fires. Increased use of higher elevation areas is also apparent during this time period.

A drought around 1,400 years ago, Late Archaic (1,500 – 600 BP), caused shrinking of the lakes and marsh. However, the number of sites distributed across the basin and surrounding the lakes increased after this drought when moist conditions returned to the area. Lake, marsh and upland resources were abundant and sites from this period are found around the lakes and extend into the Blitzen Valley in increasing numbers. This may be the period of most intensive use of resources in the Harney Basin.

Geomorphic data suggests that the lakes rose significantly 1,050 years ago and again flowed into the Malheur River for a short time, before it shrank to the size (50,000 acres) seen today. A drought around 700 and then 500 years ago may have briefly limited the resources available to inhabitants of the basin, however, people continued to live in stone ring villages in the valley and on the lakes and exploited higher elevation resources after the drought. Mat covered structures known as wickiups, used for shelter part of the year, appear during this late period. This pattern extended into the historic period, Late Prehistoric (600 – 100 BP) when the Wada'tika (Northern Paiute of the Harney Basin) used the same resources as those identified in the archaeological record.

Historic Resources

The first Europeans to visit Harney Basin were fur trappers from the Hudson's Bay Company. Peter Skene Ogden traveled along the north shore of the lakes in 1826 in his search for fur bearing animals. This was one of the first contacts between the Northern Paiute of the Harney Basin and Europeans. Other fur trapping expeditions followed in the 1830s.

Wagon trains were the next significant presence of Europeans in the basin. The 1845 Meek Wagon Train crossed along the northern side of the basin and camped along Harney Lake on its journey west. In 1853 the "Lost Wagon Train" led by Elijah Elliot detoured along the south side of the lakes and crossed the Blitzen River at "Rockford Crossing" just north of the Craters Fire. After passing south of Malheur, Mud and Harney Lakes (through the Basque Wells fire area), the wagon train used the abundant springs in the Double-O area for water.

Various military expeditions ventured into the area in the late 1850s, and several military camps were established in the Harney Basin and the Alvord area in the 1860s. Steens Mountain is named after Major Enoch Steen who made the first non-native trip up the Blitzen River in 1860.

Passage of the Homestead Act in 1862 gave the head of a household the opportunity to claim 160 acre parcels of property for \$18. Homesteaders flocked to the Harney Basin and Alvord Lake area in the 1870's and homesteading activities continued into the 1890's. The remains of homesteads are found within the Craters, Krumbo Butte, Grandad and Pueblo Fires. Evidence of these homesteads generally consists of stone foundations, spring developments, and fence lines.

Ranching on large scale began in the late 1860's and early 1870's when John Devine began ranching in the Alvord and Peter French began ranching operations in the Catlow and Blitzen Valleys. The main ranch headquarters associated with these large ranches are adjacent to the Grandad and Pueblo fires. Ranch operations undoubtedly occurred within the area of each of these fires and improvements such as fence lines, stone fences and small structures are evidence of these activities.

The Rose Valley Borax Company was in operation from 1898 to 1907 on the surface of the Alvord Valley near Borax Lake, adjacent to the Pueblo Fire. Borate minerals were mined from the alkali soils in the area and through a refining process were turned into boric acid crystals. As many as 25 to 30 Chinese laborers were employed at the mine to process the borate. Remnants of the mining operation are still apparent around Borax Lake.

Two Civilian Conservation Corps (CCC) camps were functioning in the Blitzen Valley on Malheur Refuge from 1935 through 1942. Major improvements constructed by the CCC immediately adjacent to or within the fire perimeters of the Craters and Grandad Fires include the East Canal (a major water diversion canal), the wood bridge over Bridge Creek, the Bridge Creek gaging station, boundary fences, water diversion structures and dikes.

Native American Traditional Practices

Prior to Euro-American settlement the Harney Basin and Steens Mountain area were used by Northern Paiute Bands. Traditionally used resources “include a wide variety of plant and animal foods, as well as materials for making tools and shelter. Edible roots include biscuitroot, bitterroot, camas, carrots, and onions. Available in the area are seeds of goosefoot, Indian rice grass, Great Basin wild rye, and berries such as chokecherry, currants, and elderberry. Game animals include various waterfowl, trout, marmots, pronghorn antelope, and bighorn sheep, which are found in specific habitats in the Steens Mountain area. Other game animals such as mule deer, waterfowl, sage grouse, rabbit, and ground squirrel have more widespread distribution. Plants such as red osier dogwood and willows are found in riparian settings, while grasses for basketry and food seeds are encountered in upland plant communities. The wide bands of quaking aspen on the mid-slopes of Steens Mountain are sources of posts for hide working, and mountain mahogany for bows and digging sticks grows on the rocky ridges at and above the juniper zone.” (BLM, 2004:U-46).

Traditional resource areas and spiritual locations used by Burns Paiute Tribal members and known tribal historic sites exist in the Three Rivers Management Unit, Steens Mountain Cooperative Management and Protection Area, Andrews Management Unit and on Malheur National Wildlife Refuge. Specific traditional practice site locations are provided to both agencies on a project specific basis.

B. Reconnaissance Methodology and Results

Archaeologist Carla Burnside attended the agency briefing on September 1, 2006 where agency personnel from the Bureau of Land Management and the US Fish and Wildlife Service presented their issues and concerns to the team. Cultural Resource staff and Law Enforcement staff stressed the potential for looting of cultural resources on all fires. The great driving distances between fires on the complex increases the potential for looting and vandalism of these sites.

Field visits were made over the next 4 days to the Basque Wells, Craters, Grandad and Pueblo Fires to observe the effects of the fires, post fire erosive agents and the potential for vandalism or looting in these remote areas. The Black Point and Trout Creek Fires were not included in the field visits as BLM has no known prehistoric or historic sites in these areas. The extensive travel distances limited the amount of field time necessary for site visits. Field observations include the potential for severe wind erosion on sites within the fire perimeters and immediately adjacent to the burned areas is high; water erosion may impact sites; wood elements present on historic sites were absent; and fire activity has impacted rock art sites.

C. Findings

Concealing vegetation was removed by fire from 101 cultural resource sites within the fire perimeters. This increases the vulnerability of the surface of the sites to water and wind erosion. In similar soils on past fires in the area a considerable amount of wind erosion occurred on the surface of prehistoric sites. This is expected to occur on all prehistoric fires within the fire perimeters until vegetation has recovered.

Significant wind erosion could also occur on 37 sites immediately adjacent to the fire perimeters as the denuded, blackened surfaces heat up and create large dust devils. These large dust devils were observed on the Pueblo and Grandad fires within the burned area and traveling a considerable distance across vegetated areas picking up soil as they traveled.

Table 1. Prehistoric and Historic Cultural Resources

Fire	USFWS Sites within Fire Perimeter	USFWS Sites adjacent to Fire Perimeter	BLM Sites within Fire Perimeter	BLM Sites adjacent to Fire Perimeter
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Basque Wells	4	1	7	3
Craters	8 (1 historic)	0	1	0
Krumbo Butte	2 (1 historic)	0	0	0
Grandad	26 (4 historic)	0	9 (2 historic)	0
Pueblo	NA	NA	44 (3 historic)	33 (1 historic)
Black Point	NA	NA	0	0
Trout Creek	NA	NA	0	0
Total	40	1	61	36

Wind erosion and loss of vegetative cover will increase the visibility of artifacts on archaeological sites, increasing the potential for looting. Illegal collection of prehistoric and historic artifacts for monetary purposes or for pleasure is common in the area. The vast distances between fires and the remoteness of many cultural resource sites increases the opportunities for illegal collection and looting. Law enforcement staff from both agencies expressed concern about the potential for vandalism and looting of cultural resource sites. As was noted above the fire removed concealing vegetation at 90 prehistoric and 11 historic sites, making them more vulnerable to illegal collection and looting. Increased law enforcement patrols and monitoring of cultural resource sites should limit these impacts to prehistoric and historic sites at risk within the fire perimeters and immediately adjacent to the fire.

Sites located on BLM administered lands also may be at risk from damage by off-road-vehicles (ORV). "Direct damage occurred to many surface sites which were driven over by ORV's. Much of this happened without the recreationist being aware of the damage...In addition to these effects from recreational use of ORVs, the widespread availability of them as transportation has enabled collectors and pothunters to reach areas of the desert that had previously been of limited access" (Lyneis et al. 1980:14).

IV. RECOMMENDATIONS

D. Emergency Stabilization – Fire Suppression Repair

No specifications required.

E. Emergency Stabilization

Specification - Cultural Site Assessments (FWS #8 and BLM #9)

This treatment would entail assessment of known National Register (NR) or potentially eligible prehistoric and historic archaeological sites for post-fire damage and potential risk from erosion, looting or vandalism. Supplemental treatments may be recommended for assessed sites. This treatment may also provide emergency BAER actions on those easily accessible sites that are deemed to be highly sensitive to looting.

Specification - Cultural Site Protection (FWS #9 and BLM #10)

Looting, site disturbance and vandalism are known to occur within the areas of the South End Complex and the Basque Wells and Craters Fires. Reduced ground cover, the result of fire effects, has exposed cultural resources. Risks to cultural resources from this exposure can be minimized by law enforcement patrols and increased monitoring in selected areas.

Specification - Native American Consultation (FWS #10 and BLM #11)

Pursuant to Section 106 of the National Historic Preservation Act, as amended, the American Indian Freedom of Religion Act, Executive Order 13007, and other similar Federal Legislation, federal undertakings that may affect historic properties of religious significance require the lead Federal agency to consult with affected tribes as equal partners. Therefore, the Burns Paiute Tribe shall be consulted on emergency stabilization and rehabilitation treatments that may occur at, on, or near cultural and/or sacred sites of interest to them.

Specification - Cultural Resource Clearance (FWS # 13 and BLM #17)

Under Section 106 of the National Historic Preservation Act, the lead Federal agency must take historic properties into account prior to implementing federal undertakings. Cultural resource inventories will be conducted on areas proposed for ground disturbing treatments (fence construction, drill seeding, etc.). These inventories will be conducted prior to implementation of the proposed ground disturbing treatments in order to identify and avoid any cultural resources needing protective measures. Cultural resources, except those previously determined Not Eligible by the agency and SHPO, or having been fully mitigated, will be flagged for avoidance during activities.

G. Rehabilitation

No specifications required at this time.

H. Management Recommendations – Non-Specification Related

The USFWS should consider closing the Bridge Creek area in the Grandad Fire to all public access until vegetation has recovered adequately to conceal archaeological resources uncovered by the fire.

V. CONSULTATIONS

Name	Contact Info	Purpose of Contact
Scott Thomas District Archaeologist	Burns District BLM	Issues and site information
Don Rotell Fire Archaeologist	Burns District BLM	Site information and maps
Beth Coahran Archaeologist	Burns District BLM	Site information
George Orr Law Enforcement Officer	Burns District BLM	Law enforcement concerns
John Megan Law Enforcement Officer	Malheur National Wildlife Refuge	Law enforcement concerns
Dennis Griffin SHPO Archaeologist	Oregon State Historic Preservation Office	Consultation concerning ES Plan
Charisse Soucie Cultural Resources Program	Burns Paiute Tribe	Consultation concerning ES Plan

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