

Overlook Fire

BURNED AREA EMERGENCY RESPONSE PLAN



UNIT: U.S. Fish and Wildlife Service, Mid-Columbia River National Wildlife Refuge Complex, Hanford Reach National Monument

LOCATION: *Grant and Franklin Counties, Washington*

ORIGINAL SUBMISSION DATE: *August 8, 2007*

REVISION: *August 22, 2007*

PREPARED BY: *U.S. Fish and Wildlife Service BAER team*

Submitted By: _____ Date: _____
Gregory M. Hughes, Project Leader

EXECUTIVE SUMMARY

Introduction

This plan has been prepared in accordance with provisions contained within Chapter 620 DM 3- Burned Area Emergency Stabilization and Rehabilitation, Presidential Proclamation 7319 of June 9, 2000 and the Hanford Reach National Monument Fire Management Plan. This plan provides burned area emergency stabilization for all lands burned within the Overlook Fire perimeter and downstream impact areas including public lands administered by the U.S. Fish and Wildlife Service. Burned area rehabilitation recommendations are provided in the Burned Area Rehabilitation Plan. The primary objectives of the Overlook Fire Burned Area Emergency Response (BAER) Plan are:

- To prescribe cost effective post-fire stabilization measures necessary to protect human life, property, and critical cultural and natural resources.
- To promptly stabilize and prevent further degradation to affected resources on lands within the fire perimeter and downstream impacted areas and mitigate damages caused by fire suppression operations in accordance with approved land management plans and policies, and all relevant federal, state, and local laws and regulations.

Emergency Stabilization

This plan addresses the emergency stabilization needs for lands burned by the Overlook wildfire and administered by the Service on the Hanford Reach National Monument (HRNM). Based upon field assessments conducted by HRNM staff from July 13 – 16 and 23-24, 2007, an analysis was conducted to include: suppression impacts, watershed stability, archaeological and vegetation impacts, fire effects on known threatened and endangered (T&E) species and their habitats. Archeologists examined records of previously recorded cultural resources within the fire boundaries and initiated a cultural resource damage assessment. The vegetation specialist evaluated and assessed fire damages and suppression impacts to vegetative resources, including threatened and endangered (T&E) species, and identified values at risk associated with vegetative losses. The wildlife biologist conducted an assessment of T&E species, and other species of management concern to the HRNM.

Individual resource Burned Area Assessment Reports produced by these specialists are in Appendix I. The individual treatments specifications, including the effectiveness monitoring identified in the assessments, can be found in Part F. A summary of the activities and costs is in Part E. Appendix II contains the National Environmental Policy Act (NEPA) compliance documentation summary. Appendix III contains BEAR Plan maps; Appendix IV contains supporting documentation; and Appendix V contains the photo documentation respectively.

Fire Background

The Overlook Fire, Number 13580-9141-DQE2 was reported on July 13, 2007 at approximately 1123 hours. There were three fires ignited in the immediate vicinity by a passing thunder cell and the associated lightning. By 2200 all three fires had burned together and became the Overlook Fire. The two fires that merged into, and also became the Overlook Fire, were the Highway 24 MP 60 Fire (13580 9141 DQH0) and the Overlook 2 Fire (13850 9141 DT0T). There was no fire north of the Highway 24. The fires demonstrated extreme fire intensity on over 90% of the fire area as they were pushed through the shrub-steppe community by gusting and fire generated convection winds. The Overlook Fire burned approximately 21,233 acres, in Wyoming Big sagebrush/Bitterbrush and Riparian habitat in the eastern portion of the Hanford Reach National Monument and adjacent to the Columbia River. The fire exhibited long residence time within the riparian area trees and heavy brush in and around the WB-10 pond area. The wet ground and heavy brush in the vicinity of the WB-10 Pond and within the former ponds just to the west of the solar gate made fighting the fire especially difficult in these two areas. The majority of the fire, 21,071 acres (99.05%) is within the Wahluke Unit of the Hanford Reach National Monument (HRNM), with 12 acres (.05%) off the Wahluke in the eastern most portion of the Saddle Mountain Unit. There is 150 acres burned on private land in the southeast corner of the fire.

Firefighters from Adams County, Franklin County, Grant County, Hanford Fire and the USFWS (Mid-Columbia River NWR Complex and Turnbull NWR) responded to the incident. The Single Engine Air Tanker out of Richland Washington was used primarily on a fire in the Horse Heaven Hills Complex fires that was threatening homes in Benton City, Washington. The Overlook fire had little air support due to all resources being committed to other fires. The Single Engine Air Tanker (SEAT) based out of the Richland, Washington airport was used for retardant and water drops during mop-up efforts on day 3 in the WB10 Pond area. Use of bulldozers and disking, along with engines, supported by water tenders, eventually proved effective methods for line construction and fire containment when accompanied with backfiring and burning out of unburned fuels between constructed lines/roads and the fires edge.

A group of resources from Franklin County, Hanford Fire and the FWS initiated initial attack directly at the fires edge on all three fires, (Overlook, Overlook 2, and Highway 24 MP 60) at the same time. The Initial Attack efforts were coordinated by the three agencies listed, with FWS Fire Management Officer, Chris Schulte providing oversight as the Incident Commander for the entire fire area. On the Overlook Fire, initial attack activities were conducted by fire crews and engines and Challenger pulling a disc to create a firebreak directly adjacent to the fire. These efforts appeared to be successful in the early stages but fire escaped out of almost completed lines on a couple of occasions due to erratic and strong winds. On the Highway 24 MP 60 Fire the western and eastern lines had both been constructed and held at one point but the east line escaped on a couple of occasions over a period of hours. These escapes were also caused by shifting and gusting winds that fanned the fires across the wet and disc lines. The Overlook 2 southern most line was held where it is today with an effective

combination of wet and hand lines provided by engine crews. The attempts to halt the spread of the Overlook 2 Fire to north failed on three times and the fire rapidly burned to the north and joined the Overlook Fire. Due to the high fuel load, extreme fire intensity, and erratic winds, additional resources were ordered that included a local Type 3 Incident Management Team. Ultimately one bulldozer and two discs were utilized, in addition to the many engines and water tenders to assault the fire. The turning point in stopping the forward rate of spread and eventually the increase in acres occurred when fire crews backfired along the 24 road and joined up the northeast finger of the Overlook Fire, that had already reached Highway 24 on it's own, with the main body of the eastward moving Highway 24 MP 60 Fire, that was west of the Overlook Fire. Once Highway 24 was backfired the fire was left with no option other than to burn itself out. This final backfire occurred around 2100. Additional line construction and burnouts occurred along the western line to the south of the Highway 24 MP 60 Fire which excluded fire from a large portion of the refuge between the constructed lines and the Columbia river. In all, approximately 120 personnel were assigned to this fire. A Type 2 team from Washington was ordered by Benton and Klickitat Counties to manage three large fires and the FWS arranged to have them manage the Overlook Fire and it was placed on their Delegation of Authority for 3 days. The three large fires were then managed as the Horse Heaven Hills Complex of fires.

Ground disturbance within the shrub-steppe plant community was substantial given the fire location and necessary fire suppression actions (i.e., disking and bulldozing actions) that were employed to prevent the loss of additional acres. Drought (extremely dry) conditions along with gusting winds had the potential to result in extreme fire behavior, lofting fire brands, and high potential for fire spread. The immediate need was to contain the fire to prevent further spread.

Suppression forces accessed the edges of the fire and along boundary fences and thereby created wheel track trails, in addition to the disked/bulldozed lines. These have compacted soils, increased access potential to off-road vehicles, and negatively impacted native vegetation and micro-biotic crusts.

The Overlook Fire was contained on July 23, 2007, however, this fire is not yet controlled as of July 26th due to a minor but present threat of escape from fire in the direct vicinity of the WB 10 Ponds.

The HRNM ES Team, tasked with evaluation of short and long-term emergency stabilization needs, developed this plan to address the following issues:

- Emergency stabilization of cultural and natural resource values impacted by the fire or fire suppression actions.

Fire Damages and Threats to Human Safety and Natural and Cultural Resources

The Overlook Fire burned 21,083 acres of public lands. Fire suppression impacts included: approximately 20.7 miles of disked/bulldozed fire line (40 acres based on 16 foot width), damage to 2.5 miles of Monument boundary fence, and the potential spread

of noxious weeds including; Russian and diffuse knapweed, perennial pepperweed, salt cedar, phragmites, swainson pea, yellow starthistle, rush skeletonweed, and puncture vine.

The entire fire has been mapped by the BAER Team for burn severity. Within shrub-steppe upland habitat areas (19,743 acres) approximately 10 percent of the fire area is classified as low burn severity with 90 percent mapped as high burn severity. This attests to the fires' rapid spread through light fuels, extremely low fuel moisture levels in 100 and 1000 hour fuels and long residency times within the shrubs. Most of the soils examined were not water repellent. Therefore, an overall water yield increase due to the fire is expected to be minor and not exacerbate flooding events. Within the Riparian zones (1,340 acres) the burn severity was lower to moderate due to standing water and available fuel moistures (see maps – Appendix III).

In areas that were a shrub-steppe vegetation community prior to the fire, almost all plant and litter cover that was present in the burn area has been consumed by the fire. The loss of this vegetative cover has exposed fine sand and silty soils to ablation (wind driven erosion). Nearly all soils within the burn area (18,828 acres – see Wind Erosion map Appendix III) have a fairly high risk of wind erosion (please see photo documentation), further, sandy soils within the burn area are especially susceptible to wind, and blowing dust poses an imminent threat to human life along state Highway 24 and county Mount Vista Road and adjacent residences. The fuels within the riparian area were not completely consumed due to the high moisture content and surface water present in the area.

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

Emergency Stabilization Treatments:

- Assess the risk of further degradation to known/documented cultural resource sites.
- Increase Law-enforcement patrols.
- Minimize the establishment of non-native invasive plants.
- Prevent the permanent impairment of designated Critical Habitat for Federal listed T&E species through native grass seeding and native shrub seeding
- Monitor treatment effectiveness for site stabilization
- Prevent the establishment of noxious weeds and invasive plant species

Specifications were developed for all actions meeting the requirements for Emergency Stabilization (ES) funding.

Other resource impacts assessed as a result of the Overlook Fire included a review of cultural sites impacted, and impacts to wildlife and vegetation resources.

An archeological records search has been conducted for sites that may be located on

fire suppression lines. To conform with Section 106 requirement, further cultural resource damage assessments will be required prior to implementation of ground disturbing stabilization actions.

Federal T&E plant species listed as occurring in or having habitat within Franklin or Grant County have not been previously mapped within the fire area.

Listed wildlife species existing within the fire area include 15 species of concern, including ferruginous hawk, loggerhead shrike, and sagebrush lizard. The fire area may also be considered potential habitat for Washington ground squirrels (federal and state candidate) and Columbia Basin pygmy rabbit (federal and state endangered). (See map section Appedix III –Sensitive wildlife sightings and pygmy rabbit habitat maps)

Vegetation resources provide valuable wildlife forage and habitat, watershed protection, and comprise a visually pleasing landscape. Generally speaking, bunchgrass communities experienced greater than 90% vegetative loss. On approximately 90% of the fire area, in upland shrub-steppe zones, complete consumption of vegetative resources was observed. Most shrub, grass and forb species and organic material on the soil surface was consumed indicating extreme fire intensity. The primary vegetative concerns are the recovery of the shrub-steppe plant community (Wyoming big sagebrush and antelope bitterbrush) and control of non-native species and noxious weed invasion. In the riparian zone, the vegetative loss was approximately 50%, on 1,340 acres classed as riparian vegetation (6 % of the total fire area). The burn was incomplete in the riparian area, leaving patches of unburned vegetation within the fire perimeter and the majority of the tree canopy (i.e., Russian olives) remained while understory areas were burned. Major and immediate concern for invasion of non-native species exists in this area where available water allows for plant growth year round.

This BAER Plan is the initial funding request for Emergency Stabilization funds. The Emergency Stabilization funding for this plan is for one year from the date of fire containment. At the conclusion of the funding period, a final Accomplishment Report will be due to the approval authority. The Accomplishment Report will document the funding received, (initial and supplemental funding), treatments installed, the effectiveness of the installed treatments and the results of monitoring activities.

Hanford Reach National Monument Management Requirements

The uniqueness and biological diversity of the Hanford Reach was formally recognized by Presidential Proclamation 7319 of June 9, 2000 establishing this area as the Hanford Reach National Monument. The monument is described as a “biological treasure, embracing important riparian, aquatic, and upland shrub-steppe habitats that are rare or in decline in other areas. Within its mosaic of habitats, the monument supports a wealth of increasingly uncommon native plant and animal species, the size and diversity of which is unmatched in the Columbia Basin.” Because of the high diversity of native plant and animal species, the large number of rare and sensitive plant species, the well developed microbiotic crusts and significant breeding populations of nearly all steppe

and shrub-steppe dependent species, the FWS has been tasked to preserve and protect these objects of antiquity in perpetuity. Primary goals for the Monument through the current Draft Comprehensive Conservation Plan and Environmental Impact Statement include:

- Protect and restore the native habitats and biodiversity of the Hanford shrub-steppe ecosystem.
- Monitor, protect, and recover native plants and animals that are federally or state listed and any other species that are in any other way considered sensitive.
- Monitor status and trends of migratory birds, particularly those that are considered shrub-steppe obligate species and manage local populations.
- Provide for compatible education, interpretation, and wildlife-dependent recreational opportunities.
- Promote public understanding of the shrub-steppe ecosystem through scientific research and allow other compatible research opportunities afforded by the unique and isolated environment of the National Monument.
- Manage for the protection, preservation, evaluation, and understanding of the cultural heritage and resources of the ALE Reserve while consulting with appropriate Native American groups and complying with historic preservation legislation.
- Provide for operation and maintenance activities without compromising ecological and cultural values.

Emergency Stabilization

Emergency Stabilization actions for the Overlook fire include:

- Seeding of native species to prevent the establishment of non-native invasive plants.
- Install temporary fences and signs to protect emergency stabilization efforts and facilitate recovery of the fire area
- Noxious weed and invasive species control to protect the ecological integrity of the site.

The following statements in the approved HRNM Fire Management Plan direct the development of the proposed burned area rehabilitation treatments funded through the Burned Area Stabilization and Rehabilitation funds:

- Emergency rehabilitation measures may be requested through the Burned Area Emergency Response (BAER). BAER plans for each fire will be reviewed by the Fire Analysis Committee. A final plan will be submitted to Region for establishing an account. Rehabilitation should be initiated prior to complete demobilization or early the following season.
- Protect and restore the native habitats and biodiversity of the Hanford shrub-steppe ecosystem. (HRNM -CCP)
- Monitor, protect, and recover native plants and animals that are federally or state listed and any other species that are in any other way considered sensitive. (HRNM-CCP).

Cumulative Impacts of Fire on the Hanford Reach National Monument

The following resource assessments based on impacts from the Overlook fire document the emergency stabilization and rehabilitation needs created by this fire. However, these assessments need to be evaluated within the context of the landscape and recent fire history on the Hanford Reach National Monument (Monument).

The Overlook fire was preceded by several other large wildfires within the Monument and in the surrounding area that have caused increasing impacts to natural resources, cultural resources, and ongoing management and public use operations (Table 1). Losses of critical shrub-steppe habitat between 2000 and 2006 total 177,509 acres locally, with 90,613 acres lost within the Monument (not including the current acres burned within the Overlook fire).

Table 1:

Fire Name	Year	Cause	Total acres burned	USFWS acres burned (Monument)
24 Command	2000	Human Caused - Auto Accident	163,884	78,732
Vernita Flat	2000	Lightning	119	119
White Bluffs	2002	Lightning	285	285
Shooting Range	2003	Human Caused - Firearms discharge	1391	507
Fuji	2004	Lightning	36	36
Weather Station	2005	Human Caused - suspected fireworks, unknown	4918	4840
McLane	2005	Human Caused - Agricultural burning	6850	6068
Saddle Mountain Lakes	2006	Lightning	26	26
TOTAL			177,509	90,613

Burned Area Emergency Response (BAER) Plans have been implemented on several previously burned areas within the Monument. However, given the long time frames required for the regeneration of shrub-steppe vegetation, several of these previously burned areas are still considered to be recovering because they have not had sufficient time to re-establish what could be considered functional wildlife habitat. Through the BAER Plans, the trajectory for recovery of the native vegetative community has been enhanced. Certain key components of shrub steppe habitat, such as bunchgrasses, have started to re-establish on portions of the site that otherwise would have been seriously degraded or destroyed. Another key habitat component, the shrub layer, is much slower to recover and plantings are still immature. For example, sagebrush seedlings planted in 2001 and 2002 are still small in stature and are not yet used by wildlife in the same way that mature sagebrush stands are used. In the dry

climate of the Columbia Basin, it may take up to 30 years for shrub-steppe habitat to reach the level of functional wildlife habitat that existed before the fires (Harniss and Murray 1973). Further, wildlife do not perceive the political boundaries imposed by jurisdiction and likely have responded more to the total number of acres of shrub-steppe that have been lost or degraded due to recent fires than solely those acres lost on the Monument.

The increasing frequency and intensity of range fires, introduction of a variety of non-native and invasive species and the change in climate throughout the Columbia and Great basins pose a critical threat to native grasses and shrubs and overall wildlife habitat in the shrub-steppe. Historically, fires in the shrub-steppe were less frequent and likely less intense and smaller, resulting in a complex mosaic of habitat over the landscape. With these changes in fire patterns, native shrubs are killed, seed reservoirs of grasses and shrubs are depleted and habitat is replaced with exotic annuals such as cheatgrass (*Bromus tectorum*), Russian thistle (*Salsola kali*), or aggressive noxious weeds such as yellow starthistle (*Centaurea solstitialis*). Natural shrub regeneration is limited by incremental reestablishment from the existing shrub edge, a slow process exacerbated by current fire patterns and competition from non-native plant species.

Throughout shrub-steppe habitat in Washington, fire has continued to eliminate shrub-dominated sites at a rate faster than natural regeneration (or revegetation efforts) can restore. The regional negative impact of shrinking high quality habitat cannot be overstated. Additionally, while large landscape-sized fires also continue to occur on nearby habitat such as on the Yakama Indian Reservation the Yakima Training Center, their overall higher elevation, topographic variability and resiliency contrast with the middle and lower elevations of the Pasco Basin and the Monument, which are dominated by sand and gravel of the cataclysmic Missoula Floods. The unique geomorphic features of the Pasco Basin generally support a less resilient but highly diverse assemblage of plant communities and associated wildlife habitat.

Effectiveness of Emergency Stabilization and Rehabilitation on the Hanford Reach National Monument

Emergency stabilization treatments have proven to be effective on the Hanford Reach National Monument. Treatments have met general accomplishments (see *BAER final accomplishment reports for 24 Command Fire(2003), White Bluffs Fire(2005), Vernita Fire(2003) and Shooting Range Fire(2005)*) and have provided for soil stabilization, prevented ecological degradation and changed the fire risk across the landscape. A very powerful example of the effectiveness of BAER and ESR treatments is illustrated by mapping the fire perimeter of the Overlook fire with the White Bluffs (2002) fire perimeter and the McLane (2005) Fire perimeter (See Overlook, McLane and White Bluffs Fires Burned Areas Maps - Appendix III). The Overlook fire did not spread into these previously treated fire footprints. The fire was described as “laying down” when it reached the area that had received stabilization treatments within the McLane fire area (C. Schulte, personal communication, 7/16/2007). Although it could be argued that the fuels within this previously burned area were potentially less than surrounding unburned zones, research from the ALE unit of the Monument showed that two years following the 24 Command fire, cheat grass had recovered to pre-fire levels (TNC 2005). This research suggests that the two year old burn scar from the McLane fire would have had ample fuel, if treatments to re-vegetate native grasses had not been implemented. Further, the White bluffs

fire area, which took place in 2002, has now had five years elapse between the fire and ESR treatment to establish vegetative cover, yet, this area also slowed and stopped the spread of the Overlook fire. Re-vegetation efforts combined with invasive species treatments have served to reduce fire risk and to stabilize the previously burned areas. Treatment of the Overlook fire area will be critical not only to reduce erosion potential and to prevent site degradation but to reduce fire risk and create a more natural fire regime over time across the Monument area.

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PART A - FIRE LOCATION AND BACKGROUND INFORMATION

Fire Name	Overlook Fire
Fire Number	13580-9141-DQE2
Agency Unit	U.S. Fish and Wildlife Service, Mid-Columbia River National Wildlife Refuge Complex, Hanford Reach National Monument
Region	USFWS Region 1
State	Washington
County(s)	Franklin, Grant
Ignition Date/Cause	July 13, 2007, Lightning
Zone	Pacific Northwest
Date Fully Contained	July 23, 2007
Jurisdiction	Acres
Mid-Columbia River National Wildlife Refuge Complex, Hanford Reach National Monument	21,083
<i>Private land</i>	150
Total Acres	21,233
Date Contained	July 23, 2007

PART B - NATURE OF PLAN

Type of Action (check one box below)

<input checked="" type="checkbox"/>	Initial Submission
<input type="checkbox"/>	Amendment to the Initial Submission

PART C - EMERGENCY STABILIZATION ASSESSMENT

Emergency Stabilization Objectives

- *Locate and stabilize severely burned conditions that pose a direct threat to human life, property, or critically important cultural and natural resources*
- *Recommend post-fire emergency stabilization prescriptions that stabilize and prevent further degradation to natural and cultural resources.*
- *Develop monitoring specifications designed to document the effectiveness of emergency stabilization treatments in achieving 620 DM 3.7.m objectives.*
- *Ecological stabilization through seeding of native species to; prevent the establishment of non-native invasive plants, reduce wind driven erosion that decreases site productivity and causes a safety hazard for drivers on state and county roads.*
- *Establish temporary management fences to; protect emergency stabilization efforts, facilitate recovery of the fire area.*
- *Minimize the establishment of non-native invasive species within the burned area.*

PART D - TEAM ORGANIZATION, MEMBERS, AND RESOURCE ADVISORS

I. Burned Area Emergency Response Team Members: *(List of technical specialists used to develop the plan)*

Position	Team Member (Agency)
Team Leader	Heidi Newsome (USFWS)
Public Information	Paula Call (USFWS)
Operations	Chris Schulte (USFWS)
NEPA Compliance & Planning	Dan Haas (USFWS)
Cultural Resources/Archeologist	Alex Bourdeau (USFWS)
Vegetation Specialist	Heidi Newsome (USFWS) and Kevin Goldie (USFWS)
Wildlife Biologist	Heidi Newsome (USFWS) and Kevin Goldie (USFWS)
GIS Specialist	Lindsey Hayes (USFWS) and Kevin Goldie (USFWS)
Documentation/Computer Specialist	Kevin Goldie (USFWS)
Photographer	Chris Schulte (USFWS), Heidi Newsome (USFWS), Kevin Goldie (USFWS)
<i>Other Technical Specialists</i>	

III. Resource Advisors: *(Note: Resource Advisors are individuals who assisted the burned area emergency response team with the preparation of the plan. See Part H for a full list of agencies and individuals who were consulted or otherwise contributed to the development of the plan.)*

Name	Affiliation
Gregory M. Hughes	Project Leader, Mid-Columbia River National Wildlife Refuge Complex
Michael Ritter	Deputy Project Leader, Mid-Columbia River National Wildlife Refuge Complex
Paula Call	Outdoor Recreation Planner
Chris Schulte	Fire Management Officer

PART F - INDIVIDUAL SPECIFICATIONS

TREATMENT/ACTIVITY NAME	Law enforcement monitoring of cultural resources exposed by fire	PART E SPECIFICATION #	1
NFPORS TREATMENT CATEGORY*	Heritage Resources	FISCAL YEAR(S) (list each year):	2007, 2008
NFPORS TREATMENT TYPE *	Protect Heritage Sites	WUI? Y / N	N
IMPACTED COMMUNITIES AT RISK	None	IMPACTED T&E SPECIES	None

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

I. 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: Looting and vandalism are known to occur within the HRNM. Reduced ground cover as the result of fire effects expose cultural resources locations to increased risk from looting. Such risks can be reduced by using remote sensing units and through increased law enforcement patrols in response to remote sensing signals.</p> <p>B. Location/(Suitable) Sites: Historic Properties within the burned areas. Such locations are exempt from public disclosure under the Archaeological Resources Protection Act of 1979 (ARPA), and the Freedom of Information Act (FOIA) The USFWS maintains its own records on the location of sensitive cultural resources, and will provide, as necessary such information to law enforcement officers, and the professional archaeologist having oversight for compliance with the implementing regulations under the NHPA.</p> <p>C. Design/Construction Specifications:</p> <ol style="list-style-type: none"> 1. Purchase and install remote sensing equipment at known cultural sites. 2. Coordinate enhanced law enforcement patrols with unit management and the Region 1 Cultural Resources Team. Increase systematic and discretionary patrols above routine law enforcement activities, respond to remote sensing equipment signals and make contact as appropriate, and take action against violators. <p>D. Purpose of Treatment Specifications: To enforce area closures and to protect exposed, sensitive cultural resources and deter looters. Special attention will be given to areas that are known to be subject to active looting. Deployment of sensors and enhanced patrols should continue until public interest decreases, and re-growth has served to obscure previously exposed artifacts and features.</p> <p>E. Treatment Effectiveness Monitoring Proposed: HRNM staff will monitor for effectiveness of law enforcement efforts to dissuade looting and vandalism. Enhanced law enforcement activities will be curtailed when looting decreases to pre-fire levels.</p>

II. LABOR, MATERIALS AND OTHER COST:

<p>➤ PERSONNEL SERVICES: (Grade @ Cost/Hours X # Hours X # Fiscal Years = Cost/Item): Do not include contract personnel costs here (see contractor services below).</p>	COST / ITEM
LE Officer/Park Ranger GS-9 @ \$35.62/day for 600 hours – install, monitoring and maintenance	\$21,372.00
TOTAL PERSONNEL SERVICE COST	\$21,372.00
<p>➤ 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.</p>	COST / ITEM
Sensors and repeaters (3)	13,050.00
TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST	13,050.00
<p>➤ MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item):</p>	COST / ITEM
4 X 4 Pickup through GSA services @ \$400 /month x 6 months (field visits and inspections) x 1 fiscal years	\$2,400.00
Replacement cables and parts	\$900.00
TOTAL MATERIALS AND SUPPLY COST	\$3,300.00
	COST /

➤ TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item):	ITEM
TOTAL TRAVEL COST	
➤ CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):	COST / ITEM
TOTAL CONTRACT COST	

SPECIFICATION COST SUMMARY

FISCAL YEAR	PLANNED INITIATION DATE (M/D/YYYY)	PLANNED COMPLETION DATE (M/D/YYYY)	WORK AGENT	UNITS	UNIT COST	PLANNED ACCOMPLISHMENTS	PLANNED COST
FY07	8/5/07	9/30/2007	FA	Hours	\$62.87	40	\$2,514.80
FY08	10/1/2007	7/23/2008	FA	Hours	\$62.87	560	\$35,207.20
FY__							
FY__							
TOTAL							\$37,722.00

Work Agent: CA=Coop Agreement, FA=Force Account, G=Grantee, P=Permittees, SC=Service Contract, TSP=Timber Sales Purchaser, V=Volunteer

SOURCE OF COST ESTIMATE

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

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

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

See Cultural Resource Burned Area Assessment.

IV. TOTAL COST BY JURISDICTION

JURISDICTION	UNITS TREATED	COST
U.S. Fish and Wildlife Service, Mid-Columbia River Refuge Complex, Hanford Reach National Monument	20 sites	\$37,722.00
TOTAL COST		\$37,722.00

PART F - INDIVIDUAL SPECIFICATION

TREATMENT/ACTIVITY NAME	Determine whether known historic properties are at risk of further degradation	PART E SPECIFICATION #	2
NFPORS TREATMENT CATEGORY*	Heritage Resources	FISCAL YEAR(S) (list each year):	2007, 2008
NFPORS TREATMENT TYPE *	Protect Heritage Sites	WUI? Y / N	N
IMPACTED COMMUNITIES AT RISK	None	IMPACTED T&E SPECIES	None

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

I. 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: Determine whether known historic properties may be further degraded within the area burned by the Overlook Fire in order to complete a site inspection record and develop a condition assessment for cultural resource compliance.</p> <p>B. Location/(Suitable) Sites: Cultural Resources within burned areas and/or areas where suppression activities occurred (approximately 20 sites). Such locations are exempt from public disclosure under the Archaeological Resources Protection Act of 1979 (ARPA), and the Freedom of Information Act (FOIA) The USFWS maintains its own records on the location of sensitive cultural resources, and will provide, as necessary such information to law enforcement officers, and the professional archaeologist having oversight for compliance with the implementing regulations under the NHPA.</p> <p>C. Design/Construction Specifications:</p> <ol style="list-style-type: none"> 1. Relocate previously recorded cultural resources within the burned area to conduct site inspection and determine condition and threats to sites. 2. Site inspection should include potential degradation from environmental exposure; such as wind deflation, undercutting and loss of integrity, as well as wind-aided burial or erosion of surface features, increased visibility and vulnerability to looting. 3. Develop mitigation, rehabilitation or monitoring recommendations, measures and cost estimates for each site that may be threatened by burial, destabilization, exposure to the public, or erosion consequent to fire/suppression effects. 4. Initiate consultation with Tribal governments, Native American Indian communities and SHPO as required under 36 CFR 800. <p>D. Purpose of Treatment Specification: This action is necessary to meet legislative mandates under Section 106 of the National Historic Preservation Act and 36 CFR 800.</p>

II. LABOR, MATERIALS AND OTHER COST:

➤ PERSONNEL SERVICES: (Grade @ Cost/Hours X # Hours X # Fiscal Years = Cost/Item): Do not include contract personnel costs here (see contractor services below).	COST / ITEM
Principal Investigator 4 hours @ \$80/hour	320.00
Crew Chief 120 hours @ \$50/hour	6000.00
Crew 60 hours @ \$28/hour	1680.00
FWS Tribal consultation/interviews \$400/day for 4 days	1600.00
TOTAL PERSONNEL SERVICE COST	\$9600.00
➤ EQUIPMENT PURCHASE, LEASE AND/OR RENT (Item @ Cost/Hour X # of Hours X #Fiscal Years = Cost/Item): Note: Purchases require written justification that demonstrates cost benefits over leasing or renting.	COST / ITEM
TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST	
➤ MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item):	COST / ITEM

TOTAL MATERIALS AND SUPPLY COST		
A.	➤ TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item):	COST / ITEM
	4 X 4 Pickup @ .485/mile x 100 miles/day x 10 days x 1 FY's –Field visits	485.00
	2 – Round Trip travel from Regional Cultural Resources Office in Sherwood Oregon : 490 Miles @ .485/mile X 2 trips	475.30
	Per diem Lodging and meals, Richland Washington 10 days (lodging \$60/day and Meals & incidentals \$39/day)	990.00
	TOTAL TRAVEL COST	1,950.30
	➤ CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):	COST / ITEM
	TOTAL CONTRACT COST	

SPECIFICATION COST SUMMARY

FISCAL YEAR	FUNDING SOURCE	WORK AGENT	UNITS	UNIT COST	NUMBER OF UNITS	PLANNED COST
FY07	EFR	FA	Sites	\$577.52	7	\$4,042.60
FY08	EFR	FA	Sites	\$577.52	13	\$7,507.70
FY__						
FY__						
TOTAL						\$11,550.30

Work Agent: CA=Coop Agreement, FA=Force Account, G=Grantee, P=Permittees, SC=Service Contract, TSP=Timber Sales Purchaser, V=Volunteer

SOURCE OF COST ESTIMATE

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

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

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

See Cultural Resource Burned Area Assessment.

IV. TOTAL COST BY JURISDICTION

JURISDICTION	UNITS TREATED	COST
U.S. Fish and Wildlife Service, Mid-Columbia River Refuge Complex, Hanford Reach National Monument	20	11,550.30

	TOTAL COST	11,550.30

PART F - INDIVIDUAL SPECIFICATION

TREATMENT/ACTIVITY NAME	Non-native invasive species control-Integrated Pest Management	PART E SPECIFICATION #	3
NFPORS TREATMENT CATEGORY*	Invasive Species	FISCAL YEAR(S) (list each year):	2008, 2009
NFPORS TREATMENT TYPE *	Chemical/Biological/Mechanical	WUI? Y / N	N
IMPACTED COMMUNITIES AT RISK	Sagebrush steppe, Riparian	IMPACTED T&E SPECIES	Columbia Basin pygmy rabbit DPS (Endangered), Columbia Basin Greater Sage-grouse DPS(Candidate), Washington ground squirrel (Candidate)

* 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: Minimize the noxious weed infestations remaining and control new infestations within Overlook Fire area prior to seed-set and maturation. Current weed species observed include Rush skeleton weed (<i>Chondrilla juncea</i>), Russian knapweed (<i>Acroptilon repens</i>), Perennial pepperweed (<i>Lepidium latifolium</i>), diffuse knapweed (<i>Centaurea diffusa</i>), yellow starthistle (<i>Centaurea solstitialis</i>), puncturevine (<i>Tribulus terrestris</i>), salt cedar (<i>Tamarix ramosissimus</i>, <i>T. parviflora</i>), swainsonpea (<i>Sphaerophysa salsula</i>), Canada thistle (<i>Cirsium arvense</i>), Russian Olive (<i>Eleagnus angustifolia</i>), Phragmites (<i>Phragmites australis</i>), kochia (<i>Bassia scoparia</i>), and Russian thistle (<i>Salsola kali</i>). 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. Control Cheatgrass (<i>Bromus tectorum</i>) that germinates in fall of 2007 and spring of 2008 to reduce competition with native species recovery and reseeded efforts.</p> <p>B. Location/(Suitable) Sites: Control all visible noxious weed populations along roads, trails and disturbed sites within the fire area. Control sites identified include dozerlines, disklines, known infestations of Russian knapweed, Perennial pepperweed, Rush skeletonweed, Diffuse knapweed, Puncturevine, Russian Olive, Kochia, and Russian thistle. Control non-native invasive species, such as Cheatgrass, within the fire perimeter to decrease competition for native grass seeded species.</p> <p>C. Design/Construction Specifications:</p> <ol style="list-style-type: none"> Control known populations of noxious weeds as identified in USFWS reviews (see Maps Appendix III) prior to seed set. Recommended herbicide for Russian knapweed is Milestone (aminopyralid) @ 6 oz/acre. Recommended herbicides for Perennial pepperweed are Escort XP (metsulfuron methyl) @ 2 oz/acre and 2,4-D Amine @ 2 pt/acre. Recommended herbicides for Rush skeletonweed, Diffuse knapweed, Puncturevine, Kochia, and Russian thistle, within upland shrub-steppe areas, are Transline (clopyralid) @ 1pt/gallon spot treatment and 2,4-D Amine @ 2 pt/acre in broadcast application. Recommended herbicides for Russian olive are Arsenal (imazapyr) @ 1% solution and Garlon 4 (triclopyr) @ 1.5% solution for spot treatment (foliar) application. Recommended herbicide for cheatgrass control is Roundup PRO® (glyphosphate), Journey® (imazapic/glyphosate) or Plateau® (imazapic). Application at low concentrations (3.5 oz.-1 pint/acre Round up PRO, 2-4 oz Plateau/acre, 6-11 oz Journey/acre) during late winter-early spring will minimize damage to native species. This treatment combination will evaluate which treatment works most effectively to reduce cheat grass. Adjuvants (e.g., surfactant, drift control agents, de-foaming agents) will be required for all weed treatments. Recommended herbicides for Russian knapweed, Perennial pepperweed, Rush skeletonweed, Diffuse knapweed, Puncturevine, Kochia, and Russian thistle within riparian habitat areas are AquaNeat (glyphosate) @ 2.5 pt/acre and 2,4-D Amine @ 2 pt/acre. Recommended herbicides for Russian olive and Salt Cedar within riparian habitat areas are Habitat (imazapyr) @ 1% solution and Garlon 3A (triclopyr) @ 1.5% solution for spot treatment (foliar) application. Adjuvants (e.g., surfactant, drift control agents, de-foaming agents) will be required for all weed treatments. Roadside and small infestations will be treated by backpack spraying or truck/ATV mounted sprayer. Non-native invasive species control within interior of fire area will be treated using fixed-wing or rotary aircraft services. Winds in the area to be sprayed should be less than 10 MPH (constant). A buffer of 150 feet will be adhered to around all private land areas. Herbicides approved for aquatic use will be used in riparian wetland areas according to labeled specifications. Applicator will be state certified. All aircraft used should be OAS certified; will be equipped with GPS guidance systems and contractor will be licensed and bonded. Locate, map, and document (using photography, topographic maps, and Global Positioning System--GPS—technology), new weed occurrences within burned area. Provide GPS shapefile to aerial contractors for use in GPS guided applications. Document percent control or kill of noxious weeds. <p>D. Purpose of Treatment Specifications: Protect the ecological integrity and site productivity of shrub-steppe plant communities and riparian areas within the Hanford Reach National Monument in accordance with established management plan guidelines.</p> <p>E. Treatment Effectiveness Monitoring Proposed: Spot checking of noxious weed sites to ensure control methods are meeting management objectives. A staff person from the Mid-Columbia River NWR Complex will visit sites controlled every week after initial treatment; this is especially important for weed populations that are sprayed to ensure effectiveness of herbicide application. If both spring and summer/fall applications are used then visits will occur during both these times. Also see Specification for Effectiveness monitoring of treatments.</p>

LABOR, MATERIALS AND OTHER COST:

PERSONNEL SERVICES: (Grade @ Cost/Hours X # Hours X # Fiscal Years = Cost/Item): Do not include contract personnel costs here (see contractor services below).	COST / ITEM
Maintenance Laborers (3) x \$30/hour x 60 hours per treatment x 3 treatment periods x 1 year (Backpack spraying work)	16,200.00

Wildlife Biologist (GS-12) x \$39/hour x 40 hours per treatment x 6 treatment periods x 1 year	9,360.00
TOTAL PERSONNEL SERVICE COST	25,560.00
EQUIPMENT PURCHASE, LEASE AND/OR RENT (Item @ Cost/Hour X # of Hours X #Fiscal Years = Cost/Item): Note: Purchases require written justification that demonstrates cost benefits over leasing or renting.	COST / ITEM
Misc. Spray nozzles, hoses, backpack sprayer, equipment repair	1000.00
Hydraulic excavator for tree removal, @ \$145/hr for 120 hours, with 1 time cost for Mob and De-Mob \$460.	17,860.00
TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST	18,860.00
MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item):	COST / ITEM
Roundup Pro - 126 gallons (4 ounces/ac x 4026 ac.) @ \$32/gallon	4,032.00
Plateau - 172 gallons (4 ounces/acre x 5503 acres) @ 277.00/gallon	47,644.00
Journey - 348 gallons (11 ounces/acres x 4046 acres) @ 108.00/gallon	37,584.00
Milestone - 28 gallons (6 oz/acre x 600 acres) @ \$350/gallon	9,800.00
Escort XP - 10 gallons (2 oz/acre x 300 acres) @ \$80/gallon	800.00
2,4-D Amine- 120 gallons (2 pt/ac x 500 acres) @ \$9.50/gallon	1,140.00
Transline - 10 gallons (0.5% solution over 500 acres-spot treatments) @ \$295/gallon	2,950.00
Arsenal - 10 gallons (1% solution over 100 acres-spot treatments) @ \$270/gallon	2,700.00
Garlon 4 - 10 gallons (1.5% solution over 500 acres-spot treatment) @ \$80/gallon	800.00
AquaNeat - 60 gallons (2.5 pt/acre x ~200 acre) @ \$35/gallon	2,100.00
Habitat - 20 gallons (1% solution over 2000 acres Riparian habitat) @ \$270/gallon	5,400.00
Garlon 3A - 10 gallons (1.5% solution over 100 acres Riparian habitat) @ \$80/gallon	800.00
MSO or MVO Surfactant - 60 gallons @ \$ 16.00/gallon	960.00
Biological Control Agents- Russian Thistle, diffuse knapweed, Canada thistle, yellow starthistle, rush skeletonweed, salt cedar, purple loosestrife	10,000.00
TOTAL MATERIALS AND SUPPLY COST	126,710.00
TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item):	COST / ITEM
4 X 4 Pickup @ .485/mile x 100 miles/day x 20 days x 1 fiscal year	970.00
TOTAL TRAVEL COST	970.00
CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):	COST / ITEM
Aerial Application of Herbicide-13,575 ac. X \$18/ac.	244,350.00
Inventory and monitoring. Contract, 2 scientists @ \$50/hour X 5 weeks spring (200 hours) and 5 weeks fall (200 hours)= 40,000 per year X 1FY	40,000.00
TOTAL CONTRACT COST	284,350.00

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
FY08__	10/01/2007	7/23/2008	S	Acres	33.62	13,575	456,450.00
FY09__							
FY__							
FY__							
TOTAL							

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

SOURCE OF COST ESTIMATE

1.	Estimate obtained from 2-3 independent contractual sources.	
2.	Documented cost figures from similar project work obtained from local agency sources.	C, E
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, P, T
5.	No cost estimate required - cost charged to Fire Suppression Account	

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

RELEVANT DETAILS, MAPS AND DOCUMENTATION INCLUDED IN THIS REPORT:

See Vegetation and Soils Resource Damage Assessment and Wildlife Damage Assessment.

TOTAL COST BY JURSDICTION

JURSDICTION	UNITS TREATED	COST
U.S. Fish and Wildlife Service, Mid-Columbia River Refuge Complex, Hanford Reach National Monument	13,575 acres	456,450.00

	TOTAL COST	456,450.00

PART F - INDIVIDUAL SPECIFICATION

TREATMENT/ACTIVITY NAME	Ecological Stabilization- Native Seeding	PART E SPECIFICATION #	4
NFPORS TREATMENT CATEGORY*	Invasive Species	FISCAL YEAR(S) (list each year):	2008
NFPORS TREATMENT TYPE *	Prevention/Seeding	WUI? Y / N	N
IMPACTED COMMUNITIES AT RISK	Sagebrush steppe	IMPACTED T&E SPECIES	Columbia Basin pygmy rabbit DPS(Endangered), Columbia Basin Greater Sage-grouse DPS (Candidate), Washington ground squirrel (Candidate)

* 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: Apply native seed mix through aerial broadcast, and drill seeding applications in burned area to prevent the establishment of noxious weeds and invasive non-native species, and to limit erosion and stabilize soils.</p> <p>B. Location/(Suitable) Sites: The Overlook Fire area on Monument lands (21,083 acres) is located on the Wahluke unit of the Hanford Reach National Monument (see Appendix 5 – Maps). Reseeding should take place across the portions of the fire area (4,442 acres aerial seed, 1,000 acres aerial seed with hydromulch and 11,578 acres drill seed) that were critical shrub-steppe habitat areas to stabilize soils, limit weed invasion, and promote ecological integrity. Riparian areas will be seeded using native seed mix with Great Basin Wild Rye seed added around the edges of the pond area and outlet creek zone, 815 acres.</p> <p>C. Design/Construction Specifications:</p> <p>1. <u>Purchase native seed mix</u>: in appropriate amounts to stabilize soils and ecological function according to the following specifications for native seed mix.</p> <p>Mix 1 : Sandy soils areas: 3,515 acres aerial application, with 6,514 acres drill seed application</p> <p><u>Grasses</u></p> <table> <tr> <td>Indian Ricegrass (<i>Oryzopsis hymenoides</i>) (Nez Par)</td> <td>3 lbs./ac. PLS</td> </tr> <tr> <td>Needle and thread grass (<i>Stipa comata</i>)</td> <td>0.2 lbs/acre</td> </tr> <tr> <td>Sandberg's bluegrass (<i>Poa sandbergii</i>) (Hanford)</td> <td>2 lbs./ac. PLS</td> </tr> <tr> <td>Sand dropseed (<i>Sporobolous cryptandrus</i>)</td> <td>0.2 lb. /ac PLS</td> </tr> <tr> <td>Bottlebrush Squirreltail (<i>Elymus elymoides</i>)</td> <td>1.5 lbs./ac PLS</td> </tr> <tr> <td>Thickspike Wheatgrass (Swindemar) (<i>Elymus lanceolatus</i>)</td> <td>4 lbs./ac PLS</td> </tr> <tr> <td>Prairie Juengrass (<i>Koeleria cristata</i>)</td> <td>0.2 lbs. /ac PLS</td> </tr> </table> <p><u>Forbs</u></p> <table> <tr> <td>Yarrow, (<i>Achillea millefolium</i>)</td> <td>0.2 lbs./ac PLS</td> </tr> <tr> <td>Columbia Blue Flax (<i>Linum</i> sp.)</td> <td>0.2 lbs./ac PLS</td> </tr> </table> <p><u>Shrubs</u></p> <table> <tr> <td>Wyoming Big Sagebrush (<i>Artemisia tridentate</i> ssp. <i>wyomingensis</i>)</td> <td>0.1 lbs/ac PLS</td> </tr> <tr> <td>Winterfat (<i>Krascheninnikovia lanata</i>)</td> <td>0.1 lbs/ac PLS</td> </tr> <tr> <td>Antelope bitterbrush (<i>Purshia tridentata</i>)</td> <td>0.1 lbs/ac PLS.</td> </tr> </table> <p>Mix 2 : Loamy (less sandy) acres: 1927 acres aerial application, with 4,250 acres drill seed application This mix will be drill seeded with the Great Basin wild ryegrass in riparian areas (815 acres)</p> <p><u>Grasses</u></p> <table> <tr> <td>Indian Ricegrass (<i>Oryzopsis hymenoides</i>) (Nez Par)</td> <td>3 lbs./ac. 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PLS	Needle and thread grass (<i>Stipa comata</i>)	0.2 lbs/acre	Sandberg's bluegrass (<i>Poa sandbergii</i>) (Hanford)	2 lbs./ac. PLS	Sand dropseed (<i>Sporobolous cryptandrus</i>)	0.2 lb. /ac PLS	Bottlebrush Squirreltail (<i>Elymus elymoides</i>)	1.5 lbs./ac PLS	Thickspike Wheatgrass (Swindemar) (<i>Elymus lanceolatus</i>)	4 lbs./ac PLS	Prairie Juengrass (<i>Koeleria cristata</i>)	0.2 lbs. /ac PLS	Yarrow, (<i>Achillea millefolium</i>)	0.2 lbs./ac PLS	Columbia Blue Flax (<i>Linum</i> sp.)	0.2 lbs./ac PLS	Wyoming Big Sagebrush (<i>Artemisia tridentate</i> ssp. <i>wyomingensis</i>)	0.1 lbs/ac PLS	Winterfat (<i>Krascheninnikovia lanata</i>)	0.1 lbs/ac PLS	Antelope bitterbrush (<i>Purshia tridentata</i>)	0.1 lbs/ac PLS.	Indian Ricegrass (<i>Oryzopsis hymenoides</i>) (Nez Par)	3 lbs./ac. PLS	Needle and thread grass (<i>Stipa comata</i>)	0.2 lbs/acre	Sandberg's bluegrass (<i>Poa sandbergii</i>) (Hanford)	2 lbs./ac. PLS	Sand dropseed (<i>Sporobolous cryptandrus</i>)	0.2 lb. /ac PLS	Bottlebrush Squirreltail (<i>Elymus elymoides</i>)	1.5 lbs./ac PLS	Bluebunch Wheatgrass (<i>Pseudoroegneria spicata</i>)	4 lbs./ac PLS	Prairie Juengrass (<i>Koeleria cristata</i>)	0.2 lbs. /ac PLS	Yarrow, (<i>Achillea millefolium</i>)	0.2 lbs./ac PLS	Columbia Blue Flax (<i>Linum</i> sp.)	0.2 lbs./ac PLS	Wyoming Big Sagebrush (<i>Artemisia tridentate</i> ssp. <i>wyomingensis</i>)	0.1 lbs/ac PLS	Winterfat (<i>Krascheninnikovia lanata</i>)	0.1 lbs/ac PLS	Antelope bitterbrush (<i>Purshia tridentata</i>)	0.1 lbs/ac PLS	Great Basin Wild Ryegrass seed (<i>Elymus cinereus</i>)	4 lbs/acre PLS
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Great Basin Wild Ryegrass seed (<i>Elymus cinereus</i>)	4 lbs/acre PLS																																																		

2. **Seed Mixture Selection and Certification:** The seed mix should be tested for purity and germination rates. Before accepting delivery of seed shipment the contractor must provide written evidence (seed label and letter) to the Monument managers (Deputy Project Leader or Natural Resources Specialist) that the seed conforms to the purity and germination requirements in the specification. Seed must also be source identified as to its origin. Columbia Basin derived and grown seed is required, where practical, for all native grass, forb and sagebrush species.

3. **Delivery:** Deliver certified weed-free seed sold on pure live seed basis. Deliver to Hanford Reach National Monument.

Storage: Seed should be applied as soon as possible after delivery. If immediate application is not possible the seed should be stored under dry, cool conditions and protected from rodents and other wildlife. Seed also needs to be protected from dew and rain.

4. **Timing of Seeding Application:** Seeding should occur in December, 2007, or no later than late January, 2008.

Application Rate: Seed will be applied at the above rates, on a PLS/acre basis.

5. **Application Method:** Seed will be applied by aerial contract services for broadcast seed operations. Broadcast seeding will be conducted by fixed-wing aircraft. Aircraft should be OAS certified; will contain GPS guided navigational systems for accurate seed placement to coordinates provided by the USFWS; contractor must be bonded.

Hydromulch Applications- Approximately 1000 acres will be hydromulched to stabilize highly erosive soils. Mulch specifications are to include mulch delivered at a rate of 1,000 lbs./ acre containing 40% paper and 60% wood fiber. Mulch will contain a binder containing Supertack at a rate of 80 lbs./ac. Mulch will contain seed provided by USFWS and applied at the rate specified in above mix on a PLS pounds to the acre basis. Mulching operations will require GPS guided application from fixed-wing aircraft and will require same stipulations as described in Aerial seeding treatment.

Drill Seeding- Approximately 11,578 acres of the Overlook fire will be seeded with a rangeland drill on sandy loam and loamy sand soils on the southeastern and western and northwestern portions of the fire. Drill seeding operations will be conducted at ½ the aerial application rate. Drill seeding will also be applied around the pond and creek riparian area (815 acres) using great basin wild ryegrass seed.

D. Purpose of Treatment Specifications: To promote ecological recovery of native shrub/steppe ecosystem and riparian zones, to prevent invasion by non-native species and noxious weeds, and to stabilize soils.

E. Treatment Effectiveness Monitoring Proposed: Monitor to determine effectiveness and if a second seeding is needed. See specification Effectiveness Monitoring.

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
Wildlife Biologist (GS-12) @ \$39/hr X 240 Hours X 1 Fiscal year	9,360.00
6-Maintenance Personnel x \$30/hour x 40hours x 10 weeks (Drill seeding operations)	72,000.00
TOTAL PERSONNEL SERVICE COST	81,360.00
EQUIPMENT PURCHASE, LEASE AND/OR RENT (Item @ Cost/Hour X # of Hours X #Fiscal Years = Cost/Item): Note: Purchases require written justification that demonstrates cost benefits over leasing or renting.	COST / ITEM
2 – Rangeland drill seeders, Rental @ \$12/acre x 11,578 acres	277,872.00
TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST	277,872.00
MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item):	COST / ITEM
Native Seed Mix 1 @ \$250.68/ ac x 3,515 aerial seed acres & x 6,514 drill seed acres at ½ PLS rate (~3,257acres full rate)	1,697,605.00
Native Seed Mix 2 @ \$ 258.68/ac x 1,927 aerial seed acres & x 4,250 drill seed acres at ½ PLS rate (~ 2,125 acres full rate)	1,048,172.00
Great basin wild rye @ \$ 55 ac x 815 acres – Riparian areas	44,825.00
Cultipack rings, bearings, grease, oil, fuel (drill seeding operations)	6,000.00
TOTAL MATERIALS AND SUPPLY COST	2,796,602.00
TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item):	COST / ITEM
TOTAL TRAVEL COST	
CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):	COST / ITEM
Aerial Broadcast Seeding –Fixed Wing Aircraft \$36/ac x ~ 5,000 acres plus mobilization cost \$2,000	182,000.00
Aerial Hydromulch- Fixed Wing Aircraft \$2,300/acre x 1000 acres	2,300,000.00
Effectiveness monitoring. Contract, 2 scientists @ \$50/hour X 5 weeks spring (200 hours) and 5 weeks fall (200 hours)= 40,000 per year X 1FY	40,000.00
TOTAL CONTRACT COST	2,522,000.00

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
FY08__	10/1/2007	7/23/2008	S	acres	333.60	17,020	5,677,834.00
FY__							
FY__							
FY__							
TOTAL							

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

SOURCE OF COST ESTIMATE

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

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

RELEVANT DETAILS, MAPS AND DOCUMENTATION INCLUDED IN THIS REPORT:

Please refer to Vegetation and Wildlife Assessments- Appendix I; Treatments Map- Appendix III.

TOTAL COST BY JURSDICTION

JURISDICTION	UNITS TREATED	COST
U.S. Fish and Wildlife Service, Mid-Columbia River Refuge Complex, Hanford Reach National Monument	17,020 acres	5,677,834.00
	TOTAL COST	5,677,834.00

PART F - INDIVIDUAL SPECIFICATION

TREATMENT/ACTIVITY NAME	Emergency Stabilization Plan Development	PART E SPECIFICATION #	10
NFPORS TREATMENT CATEGORY*	Planning	FISCAL YEAR(S) (list each year):	2007
NFPORS TREATMENT TYPE *	BAER/ES Plan	WUI? Y / N	N
IMPACTED COMMUNITIES AT RISK	None	IMPACTED T&E SPECIES	Columbia Basin pygmy rabbit DPS(Endangered), Columbia Basin Greater Sage-grouse DPS (Candidate), Washington ground squirrel (Candidate)

* 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: Prepare the Emergency Stabilization (ES) plan for the Overlook Fire on the Hanford Reach National Monument.</p> <p>B. Location/(Suitable) Sites: Plan has been prepared to address all land under jurisdiction of U.S. Fish and Wildlife Service within the Overlook Fire area. Plan costs include administrative costs, salaries of planning team, and supplies.</p> <p>C. Design/Construction Specifications:</p> <ol style="list-style-type: none"> 1. Conduct a detailed assessment of burn severity, its impacts to lands and the threats to life and property; protect critical cultural and natural resources. 2. Write specifications based on assessment recommendations. 3. Submit plan for approval and secure funding from appropriate sources. 4. Per policy, complete annual reports with monitoring narratives and cost details. <p>D. Purpose of Treatment Specifications: To prepare a comprehensive ESR plan to manage or mitigate the fire impacts in order to protect life, property and critical cultural and natural resources.</p> <p>E. Treatment Effectiveness Monitoring Proposed: Per policy, an annual and final accomplishment report will be prepared with detailed costs and monitoring narratives and will be completed within 7 days of fire containment (DM 620, Chapter 3).</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-12 Supervisory Wildlife Biologist @ 39/hr X 20 hours X 1 FY	780.00
GS-11 Wildlife Biologist @ 25.50/hr X 60 hours X 1 FY	1530.00
GS-12 GIS Specialist @ 39/hr X 40 hours X 1 FY	1560.00
GS-11 Archeologist @ 25.50/hr X 60 hours X 1 FY	1530.00
GS-9 Resource Specialist @ 20/hr X 60 hours X 1 FY	1200.00
GS-5 Administrative Officer @ 13/hr X 25 hours X 1 FY	325.00
TOTAL PERSONNEL SERVICE COST	\$6,925.00
EQUIPMENT PURCHASE, LEASE AND/OR RENT (Item @ Cost/Hour X # of Hours X #Fiscal Years = Cost/Item): Note: Purchases require written justification that demonstrates cost benefits over leasing or renting.	COST / ITEM
TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST	
MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item):	COST / ITEM
TOTAL MATERIALS AND SUPPLY COST	
TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item):	COST / ITEM
TOTAL TRAVEL COST	
CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):	COST / ITEM
TOTAL CONTRACT COST	

SPECIFICATION COST SUMMARY

FISCAL YEAR	PLANNED INITIATION DATE (M/D/YYYY)	PLANNED COMPLETION DATE (M/D/YYYY)	WORK AGENT	UNITS	UNIT COST	PLANNED ACCOMPLISHMENTS	PLANNED COST
FY07_	7/16/2007	8/9/2007	P	1	6,925.00	1	6,925.00
FY__							
TOTAL							

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

SOURCE OF COST ESTIMATE

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

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TOTAL COST BY JURSDICTION

JURISDICTION	UNITS TREATED	COST
U.S. Fish and Wildlife Service, Mid-Columbia River Refuge Complex, Hanford Reach National Monument	1	6,925.00
	TOTAL COST	6,925.00

PART G - POST-EMERGENCY STABILIZATION REQUIREMENT

The following are post-emergency stabilization, implementation, operation, maintenance, monitoring, and evaluation actions after three years from the control of the fire to ensure the effectiveness of initial investments. Estimated annual cost and funding source is indicated.

1. Maintain public access and service roads (grading, spraying, mowing) (\$4,800 - 1262)
2. Maintain fire breaks (\$2,400 -9131)
3. Maintain fences and signs (\$ \$2,400 -1262)
4. Continue annual invasive species monitoring and control (\$20,000 - 1261)
5. Re-visit and re-take photo monitoring points (GS-09 Wildlife biologist, 40 hours = \$820 - 1261)
6. Monitor native planting (GS-09 Wildlife Biologist, 40 hours = \$820 – 1261)
7. Public use access and control (GS-11 Outdoor recreation planner, 80 hours \$2,040 -1263)
8. Provide education and interpretation of restoration area (GS-11 Outdoor recreation planner, 4 tours annually, 40 hours = \$1,020 – 1263)
9. Monitor rare plant populations (GS-09 Wildlife Biologist, 80 hours = \$1,640 – 1261)
10. Wildlife Resource monitoring/sensitive species surveys (GS-11 Wildlife Biologist, 320 hours = \$8,160 -1261)
11. Produce publications and reports and coordinate University research related to fire ecology (GS-12 Research biologist, 80 hours annually = \$2,400 -1261)
12. Cultural Resource protection, Law enforcement Officer (GS-9 LE officer, regular patrols once a week annually = 320 hours = \$6,560 - 1264)
13. Cultural Resource management, Tribal coordination and cooperation, Cultural Resource Specialist GS-11, (quarterly meetings annually, 40 hours plus travel cost = \$1,600 - 1261)
14. Maintain biological control insectaries/populations as reservoir to transfer to other sites. (GS-9 Wildlife Biologist, 80 hours annually = \$1,640 – 1261)
15. Continue riparian restoration (GS-9 Wildlife biologist, YCC Crew, 80- hours annually \$3,280 – 1261)
16. Continue non-native tree removal, pile and burning (Fire management, fuels reduction, \$6,000 – 9131)

PART H - CONSULTATIONS

Please see Consultations within each specific Resource Damage Assessment Report.

APPENDIX I - BURNED AREA ASSESSMENT REPORTS

BURNED AREA EMERGENCY STABILIZATION PLAN OVERLOOK FIRE- MID-COLUMBIA RIVER NATIONAL WILDLIFE REFUGE COMPLEX, HANFORD REACH NATIONAL MONUMENT

RESOURCE ASSESSMENTS

- **CULTURAL RESOURCE DAMAGE ASSESSMENT**
- **VEGETATION AND SOILS RESOURCE DAMAGE ASSESSMENT**
- **WILDLIFE RESOURCE DAMAGE ASSESSMENT**
- **OPERATIONS RESOURCE ASSESSMENT**



**BURNED AREA EMERGENCY STABILIZATION PLAN
OVERLOOK FIRE
CULTURAL RESOURCE DAMAGE 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).
- Assess potential risks to known cultural resources as the result of emergency stabilization activities.
- Coordinate with Federally recognized Tribes.

II. ISSUES

- Identify known/documented resources that have been subject to direct or indirect effects of fire and fire suppression actions.
- 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

The Overlook Fire, Number 13580-9141-DQE2 was reported on July 13, 2007 at approximately 1123 hours. There were three fires ignited in the immediate vicinity by a passing thunder cell and the associated lightning. By 2200 all three fires had burned together and became the Overlook Fire. The two fires that merged into, and also became the Overlook Fire, were the Highway 24 MP 60 Fire (13580 9141 DQH0) and the Overlook 2 Fire (13850 9141 DT0T). There was no fire north of the Highway 24. The fires demonstrated extreme fire intensity on over 90% of the fire area as they were pushed through the shrub-steppe community by gusting and fire generated convection winds. The Overlook Fire burned approximately 21,233 acres, in Wyoming Big sagebrush/Bitterbrush and Riparian habitat in the eastern portion of the Hanford Reach National Monument and adjacent to the Columbia River. The fire exhibited long residence time within the riparian area trees and heavy brush in and around the WB-10 pond area. The wet ground and heavy brush in the vicinity of the WB-10 Pond and within the former ponds just to the west of the solar gate made fighting the fire especially difficult in these two areas. The majority of the fire, 21,071 acres (99.05%) is within the Wahluke Unit of the Hanford Reach National Monument (HRNM), with 12 acres (.05%) off the

Wahluke in the eastern most portion of the Saddle Mountain Unit. There is 150 acres burned on private land in the southeast corner of the fire.

The HRNM has a large number of historic and prehistoric sites recorded within its boundaries. Most of the historic properties are related to the Hanford Site's nuclear development, including the Manhattan Project, Cold War developments, and cleanup activities associated with decommissioning of the facilities. In addition, there are pre-Hanford homesteads that were displaced in 1943 for the Hanford Site. The prehistoric component is primarily known from earlier work done by a number of archaeologists at large village sites along the Columbia River, as well as other sites located during National Historic Preservation Act, Section 106 compliance surveys.

The prehistoric cultural chronology of the Hanford Site area is taken from the *National Register of Historic Places Multiple Property Documentation Form – Historic, Archaeological and Traditional Cultural Properties of the Hanford Site, Washington* (U.S. Department of Energy 1997). The chronology summary states:

The prehistoric Columbia Plateau region has been impacted by basalt flows, catastrophic flooding, and environmental change which has meant that prehistoric regional inhabitants adapted their cultural subsistence systems as necessary to survive. The moist, cool conditions of the early Holocene meant that early peoples [12-15,000 B.P. to 8,000 years B.P.] were probably mobile, taking advantage of available resources in an organized fashion.

As the environment became drier after 8,000 years B.P., it is likely that the descendants of these early people developed a more mobile, generalized riverine-based economy. The arrival of a moist and cool environment at approximately 4,500 years B.P. was coupled with year-round residency and a hunter-gatherer subsistence pattern which was modified briefly at 3,800 years B.P.

Approximately four-hundred years later, circa 3,400 years B.P., the climate cooled once again but the sedentary lifestyle did not return to the study area until 3,000 years B.P. After this point, populations increased along the rivers as groups focused on salmon, roots and ungulates. A significant increase in storage and food processing activities were common to many people throughout the Columbia Basin although the mobility of the hunter-gatherer lifestyle remained a strong component into the ethnographic period (1997:2-1).

The Overlook Fire includes an approximately seven mile long stretch of riparian fringe on the east bank of the Columbia River. The fire also burned a second riparian area around the WB-10 Pond. Otherwise the fire occurred in shrub-steppe uplands. The part of the fire that occurred adjacent to the Columbia is

considered high probability for the presence of potentially significant and previously unrecorded archaeological sites. The riparian area around the WB-10 Pond is not considered high probability as this pond is the result of increased ground water infiltration due to irrigation. The shrub-steppe uplands are also not considered high probability as this area did not afford the requisite resources for permanent settlement.

The Ethnographic/Contact Period (1805-1943) extends from the time of first Euroamerican contact to when Native Americans were excluded from settlement and/or use of the area. This period reflects both a continuity of earlier, pre-Contact lifeways and subsequent changes to Euroamerican building styles and incorporation of Euroamerican materials. During this period, Native groups ceded lands and were, for the most part, moved onto reservations. At the present time, the Federally-recognized Confederated Tribes of the Umatilla Indian Reservation, Yakama Indian Nation, Confederated Tribes of the Colville Indian Reservation, Nez Perce Tribe and the non Federally-recognized Wanapum have expressed interest in this area (U.S. Department of Energy 1997:3.4-3.35).

Euroamerican Resettlement on the Hanford Site (1805-1943): The Historic Period began with the passage of the Lewis and Clark expedition (1805-1806) near the area. Subsequent to this came the passage of missionaries, mining, ranching, establishment of trading posts, river travel and community development (U.S. Department of Energy 1997:4.6-4.21). With the possibility of grazing and limited homestead use, the area within the Overlook Fire appears to have been bypassed by historic development in favor of other locations with better access to water.

Hanford Development (1943-1990). The history associated with the Hanford Site and its nuclear development is included in *History of the Hanford Site 1943-1990* (Harvey n.d.) and *History of the Plutonium Production Facilities at the Hanford Site Historic District, 1943-1990. Manhattan Project 1943-1946, Cold War Era 1947-1990.* (U.S. Department of Energy 2002).

Since the Overlook Fire occurred on lands that were acquired as a buffer for the Hanford Site, no development occurred from 1943-1950. Beginning in 1950, Cold War tensions resulted in military presence at Hanford. In 1950, the first 16 anti-aircraft artillery batteries were established to encircle and protect Hanford's nuclear reactors. The typical layout of a battery covered about 20 acres and had up to 20 associated buildings and structures. Beginning in 1954, the U.S. Army began supplementing the anti-aircraft artillery guns with NIKE surface to air missiles and, by late 1957-early 1958, had phased-out the artillery sites within the fire area (Harvey 2002:2-93 – 2-96). The battery sites were later razed at some unspecified date after their deactivation.

B. Methodology and Results

The USFWS Cultural Resources Team conducted a record search of maps and site forms for the area encompassed by the Overlook Fire on July 23, 2007. An analysis of the potential effects of the fire on cultural resources was also conducted. It was determined that fire suppression activities such as the excavation of 20.7 miles of fire line may have disturbed or displaced elements of both previously recorded and unrecorded cultural resources. The operation of fire fighting equipment beyond fire lines and roads also has the potential to affect sites. In addition, the fire may have exposed sites previously covered with vegetation, particularly along the Columbia River. These sites may be at greater risk of looting or vandalism. There is some potential that increased wind erosion may deflate sites previously protected by vegetation.

Prehistoric Sites

The record search and map analysis determined that there are at least four and potentially five prehistoric sites in or very near the Overlook Fire area. The five sites are:

1. 45FR264, a site containing projectile points and flakes
2. 45GR696, a low density lithic scatter
3. 45GR697, a low density lithic scatter
4. 45FR45, a site containing "camp rock", cobble tools, a stone knife and a shell bead
5. 45FR314, only information available is that this site is on or near White Bluffs. This may be an historic site.

There is an isolated find reported (45FR284) that consists of a smooth granite net weight.

In addition, there are three prehistoric sites near but outside the fire boundary that may have been impacted by the excavation of fire line and/or the operation of equipment. One prehistoric site appears to have been crossed by a fire line. Four prehistoric sites appear to have been burned over.

It is recommended that each of these sites be relocated and evaluated to determine if the fire or suppression activities had adverse effects on them. It is further recommended that the area of the fire that burned adjacent to the Columbia River be surveyed for the presence of previously unreported prehistoric sites. This area has the highest probability to contain such sites and they may be at risk of looting or vandalism from people accessing the area by boat. The fire may have made such sites more visible by removing vegetation.

Historic Sites

Since the Overlook Fire was located on the northeast side of the Columbia River, it did not affect sites related to the Hanford Historic District. However, the fire burned

on or very near two sites (45FR777 and 45FR779) associated with the anti-aircraft artillery positions that protected the nuclear reactors. Site 45FR777 is a Nike missile launch facility and 45FR779 is the control center for the Nike "Battery B" facility. Due to the removal of above-ground features and bulldozing of most foundations, these sites primarily consist of access roads, small mounds of concrete rubble, concrete pads, areas paved with asphalt, metallic debris and scattered cans that appear to date to the 1950-1960 period. The integrity of the sites has been compromised by structure removal. Impacts to the remaining structures and features at these sites by the Overlook Fire have not been determined. It is recommended that these sites be revisited and any effects evaluated.

The Overlook Fire also burned over four documented historic site areas (45FR522, 45FR529, 45FR903, and 45FR902) that are associated with water cisterns. These sites typically consist of shallow depressions surrounded by wood and/or wire fencing and associated trash/can scatters. Some of these materials may have been affected by the fire. Monitoring and evaluation of the fire's effects on these sites is recommended.

Three additional historic sites (45FR514, 45FR778, and 45FR376) may also have been affected by the fire or suppression activities. These sites are historic debris concentrations that are not associated with any extant structure or facility and contain cans, fencing, cable, fabric, and glass bottles and fragments.

A section of the historic General Palmer's road that ran from the White Bluffs Road to Wallula appears to have been burned over near the southern boundary of the fire. It is recommended that the road be inspected to determine what, if any effects the fire had on the road.

An undocumented, early-20th Century "old railroad grade" (no historic information available, only shown on the Hanford NE USGS quad map) is crossed by a fire line in the northeast part of the burned area. Given the lack of information about the grade, no additional recommendations have been determined at this time.

Additional Risks

There are no known major prehistoric villagea or known significant historic sites within the Overlook Fire area. Based on an examination of maps of the area burned there is the potential that fire suppression actions have exposed previously unreported cultural resources.

The primary threat to this area could be trespassing associated with the collection of cultural materials exposed by destruction and removal of the burned area's vegetation. Additional ground inspections are recommended to pinpoint and document the locations and appearance of (or, lack thereof) both documented and previously unrecorded historic sites and artifacts.

IV. RECOMMENDATIONS

A. Emergency Stabilization – Fire Suppression Repair

It is recommended that fire lines and other areas where suppression activities occurred be surveyed for the presence of previously unreported sites and to determine if the known sites mapped near fire lines were actually affected. If any such sites were affected, it is recommended that these sites be evaluated for eligibility to the National Register of Historic Places. If it is determined that any site(s) is eligible, then stabilization and/or mitigation measures should be developed in consultation with the Washington State Historic Preservation Office and appropriate tribes.

B. Emergency Stabilization

The following recommendations supported by specifications are offered to protect cultural resources impacted by the Overlook Fire:

#1 Law enforcement monitoring of cultural resources exposed by fire. Looting and vandalism are known to occur within the HRNM. Reduced ground cover as the result of fire effects expose cultural resources locations to increased risk from looting. Such risks can be reduced by increasing law enforcement patrols above pre-fire levels at selected sites and enforcement of area closures.

#2 Determine whether known historic properties are at risk of further degradation. Determine whether known historic properties may be further degraded within the area burned by the Overlook Fire in order to complete a site inspection record and develop a condition assessment for cultural resource compliance. This assessment must be conducted in order to comply with federal laws and regulations governing cultural resources.

C. Rehabilitation

No rehabilitation specifications specific to cultural resources are advanced at this time. However, field visits will be conducted subsequent to the submission of this plan and rehabilitation specifications submitted with the Overlook fire rehabilitation plan.

D. Management Recommendations – Non-Specification Related

If ground-disturbing activities or treatments are proposed for other resources under emergency stabilization, Section 106 clearance, including appropriate tribal consultation, should be included in that specification.

V. CONSULTATIONS

WA-SHPO – Archaeologist Alex Bourdeau will initiate contact with the Washington State Historic Preservation Office via telephone and email on August 6,

2007 that Section 106 NHPA procedures will be followed for any treatments that may affect cultural resources.

Pacific Northwest National Laboratory – Archaeologist Alex Bourdeau initiated contact on August 1, 2007 with Darby Stapp, Project Manager, Cultural Resources Project Manager, Richland, Washington.

Confederated Tribes of the Umatilla Indian Reservation - Archaeologist Alex Bourdeau initiated contact on August 3, 2007.

Yakama Indian Nation – Archaeologist Alex Bourdeau initiated contact on August 3, 2007.

Confederated Tribes of the Colville Indian Reservation – Archaeologist Alex Bourdeau will initiate contact on August 6, 2007.

Nez Perce Tribe – Archaeologist Alex Bourdeau will initiate contact on August 6, 2007.

Wanapum Tribe – Archaeologist Alex Bourdeau will initiate contact on August 6, 2007.

VI. REFERENCES

David Harvey.

N.D. History of the Hanford Site 1943-1990. Pacific Northwest National Laboratory.

D.W. Harvey.

2002 Military Operations. In History of the Plutonium Production Facilities at the Hanford Site Historic District, 1943-1990. Manhattan Project 1943-1946, Cold War Era 1947-1990, Chapter 9. Hanford Cultural and Historic Resources Program.

United States Department of Energy.

1997 National Register of Historic Places Multiple Property Documentation Form – Historic, Archaeological and Traditional Cultural Properties of the Hanford Site, Washington. February 1997.

United States Department of Energy.

2002 History of the Plutonium Production Facilities at the Hanford Site Historic District, 1943-1990. Manhattan Project 1943-1946, Cold War Era 1947-1990. Hanford Cultural and Historic Resources Program.

Alex Bourdeau, U.S. Fish and Wildlife Service, Cultural Resources Division, Region 1, Sherwood, OR (503) 625-4377

**BURNED AREA EMERGENCY STABILIZATION PLAN
OVERLOOK FIRE
VEGETATION AND SOILS RESOURCE DAMAGE ASSESSMENT REPORT**

I. OBJECTIVES

- Evaluate and assess the impacts of fire and fire suppression to vegetation resources and identify other natural resource values at risk associated with vegetation losses.
- Identify and locate threatened and endangered plant species impacted by the fire and/or fire suppression actions.
- Determine emergency stabilization and monitoring needs supported by specifications to aid in vegetation recovery and soil stabilization.
- Evaluate the potential for encroachment of invasive species into native plant communities within the burned area.
- Provide management recommendations to assist in vegetation recovery, watershed stabilization, site productivity and species habitat protection and rehabilitation.

II. ISSUES

- Protection and enhancement of other resource values including site productivity, wildlife habitat, vegetation resources, cultural resources and watershed stability.
- Determine impacts of fire to eleven plant species that are federal candidates for endangered status and/or state listed threatened, endangered and sensitive and/or their habitat.
- Develop management strategies that provide for the stabilization, natural regeneration and recovery of impacted areas.
- Immediate stabilization of denuded soils (i.e. vegetation has been removed) that may impact or redirect ecological function.
- Stabilization of watershed and riparian areas around wetland ponds and canal areas and along the Columbia River shore line.
- Monitoring of the planting/seeding effectiveness of emergency stabilization efforts.

- Monitoring of impacted lands for the early detection and control of invasive and noxious weed species.

III. OBSERVATIONS

A. Background Information

This report identifies and addresses known and potential impacts to vegetation resources within the Overlook Fire area, located on the Wahluke Unit of the Hanford Reach National Monument. The burned area consists of approximately 21,233 acres of contiguous area, 21,083 of which were within the boundaries of the Hanford Reach National Monument (Monument), and 150 of which were east of the Monument on private lands. The vegetation resources can be described as Columbia Basin shrub-steppe plant communities, many of which are considered high-quality or sensitive vegetation. Additionally, riparian zones both along the Columbia River and along irrigation return areas were impacted by the fire and fire suppression effort. Riparian zones surrounding the irrigation return wasteway and WB -10 (White Bluffs) ponds are artificial or highly altered “community types” including lakeshores, riparian areas, and wetlands that have been converted from shrub-steppe habitat due to accumulated runoff from irrigated agriculture. Plant communities in these wetlands are typically dominated by non-native species such as tamarisk and Russian olive, but also support significant stands of native willows, cattails, black cottonwood, roses and tule. Although artificial or highly altered, these areas can provide valuable wildlife habitat, especially for amphibians, birds and bats in an otherwise arid landscape. These vegetation resources provide forage and cover for a variety of wildlife species, aesthetic values, watershed stability, and biologically diverse plant associations. Additional riparian zones along the Columbia River were impacted by the fire. This riparian vegetation type includes the river shoreline, river bank and margins of the Columbia River and includes mixed native willow stands, isolated native black cottonwood trees, and stands of introduced species such as mulberry, black locust, catalpa, and poplar. These trees, although many are non-native, serve as a functional component of the riparian zone. For example, trees provide nesting habitat, perch sites and cover for many species of mammals and birds, and provide important components of habitat (i.e. shade) for aquatic invertebrates and juvenile fish. Findings and recommendations contained within this assessment are based upon field reconnaissance of the burned area, interviews with local resource specialists, local land managers, and review of relevant documents and literature.

This report will detail the known damage to the vegetation and soil resources, will discuss re-vegetation processes and future monitoring criteria, and will outline management considerations for recovery of vegetation resources.

B. Reconnaissance Methodology

Ground reconnaissance was conducted on July 13, 15, 16, 23 and 24, 2007.

Photographs were taken and are in the photo documentation section of this plan. Within upland portions of the fire area (19,743 acres of upland shrub-steppe habitat), the fire burned in a mosaic pattern on approximately 10 % of the fire area, which experienced a 50-80% vegetation mortality and loss of standing biomass (cover). Vegetation resources were significantly reduced over the remainder of the fire area. The fire consumed 90% of the standing biomass of shrubs, grasses, forbs or killed remaining shrubs through heat scorch over approximately 90% of the fire area. Blowing dust and ash was observed in areas where all vegetation had been burned and the soils are no longer stabilized by the vegetation (please see photo documentation – Appendix V). Substantial portions of the burned landscape were previously mapped with stabilized “dune trains” that will now likely be reactivated by seasonal winds.

The Monument contains many endemic plant communities and species that have been lost or significantly reduced throughout all or a significant portion of their range. Sensitive plant communities have been defined as those that are foundation plant communities, representing historic conditions within the Columbia Basin eco-region and have been identified as either state ranked, globally rare, or ecologically significant within western shrub-steppe environments. The Overlook fire damaged/destroyed 8,447 acres of plant communities identified as sensitive and ecologically significant, these represent intact plant communities representing historical vegetation conditions and may be irreplaceable or irrevocably damaged (see Sensitive Plant Communities map, Appendix III). Stabilization of these areas is critical to protect and prevent further degradation to these areas.

Within riparian portions of the fire area (1,340 acres of Riparian habitat) the fire was less intense due to standing water and available fuel moisture. These areas experienced a 50% vegetation mortality and 40-60% loss of cover. The overstory of Russian olive trees may continue to experience additional mortality over small portions of the fire area; however, much of the canopy cover remains intact, while the understory plant cover has been reduced by 60-70%.

Literature and GIS data available at the Monument headquarters relating to vegetation resources in the area was consulted for baseline data relating to pre-fire conditions on the burned area.

C. Findings

1. Soils:

Soils within the fire area consist of slackwater fines from Pleistocene floods, sandy clay, sandy loam, and previously stabilized eolian dune systems. The Pasco Basin, and the entire region, is underlain by Miocene-aged basalt that is thousands of feet thick. While the basalt is exposed along the margins of the basin along uplifted anticlines, outcrops in the study area occur only near the crest of the Saddle Mountain anticline, which forms the northern edge of the basin. At lower elevations, such as within the burned

area, the basalt is deeply cloaked beneath ancient sediments deposited by lakes and rivers that flowed into the basin between 8.5 and 3.4 million years ago (Ringold Formation, Late Miocene to Pliocene) and then by loads of sediment deposited during cataclysmic floods that occurred over a period of more than 1.5 million years (Hanford Formation, Pleistocene; Bjornstad and others 2001).

The Ringold Formation is comprised mostly of sand, silt and clay in its upper layers, some of which are cemented by calcium carbonate (Lindsey 1996). At its maximum level, Ringold sediments filled the basin to at least approximately 275 meters elevation.

Remnant uplands at this elevation are the Overlook, NIKE and Simmons benches, which are located within the burned area. Between these three benches and Saddle Mountain, the Ringold was carved into a drainage basin by an ancestral river as it flowed west to join the Paleo-Columbia River (Fecht and others, 2004). The lowest, incised channel(s) of this ancestral river was filled with sand-dominated sediments (Fecht and others, 2004).

Subsequently, between 3.4 and 2.0 million years ago a major drop in the base level occurred, which caused regional downcutting (Baker and others 1991). As a result, the Columbia River migrated eastward and began incising the Ringold Formation to create the White Bluffs (Baker and others 1991). Along the White Bluffs, the incised, sediment-filled Paleo-river channel was exposed at three sites: north of Saddle Mountain Lake, above Locke Island, and south of the Wiehl ranch (Fecht and others, 2004). The sand-dominated sediment in these exposures has less integrity than the surrounding White Bluffs matrix, and it is currently the primary source of material for active dune sets in the study area that occur east of the Columbia River within or near the area burned by the Overlook fire. Before the fire the sandy substrate was typically stabilized to some extent by vegetation, except locally along dune ridges and in blowout dunes. The effectiveness of vegetation to stabilize sandy sites likely fluctuates over time in response to precipitation patterns, fire, physical disturbance, herbivory, and other changes in species dominance.

The Overlook fire has removed approximately 80-90% of all vegetative cover within the upland areas of the fire area, exposing sandy soils to wind erosion. High winds are prevalent within this area and wind speeds of 20 MPH plus are common. During field investigations it was noted that wind whirls were common in the area, and that dust clouds were visible. The soils underlying the Overlook fire area are composed primarily of sands (10,764 acres), and loamy sand (6,513 acres) and sandy loam (1,551 acres). This high proportion (89%) of sandy soil within the fire area is at risk of erosion due to high winds (see soils map).

High wind warnings are commonplace within the Monument and dust storms often suspend work within the Hanford Nuclear Site. State Highway 24 is north of the fire area, Mt. Vista road is east of the Overlook fire, and reduced visibility during high wind events is a concern for Monument managers. Emergency stabilization actions are required to reduce soil erosion, protect site productivity and protect life and property in

and around the fire zone.

2. Vegetation:

The Overlook fire burned approximately 21,083 acres of federal lands south of Highway 24 on the eastern portion of the Wahluke Unit of the Monument. The Monument area was identified as unique and deserving of full protection by Presidential proclamation in 2000. One of the unique features of the Monument that contributed to its establishment is the diversity and vast size of native plant communities. The area has been surveyed by The Nature Conservancy of Washington and the Washington Natural Heritage Program. These surveys have identified a total of 17 terrestrial, native plant community types (or elements) that occurred as 48 separate element occurrences on the Monument. These elements are unique in the state for their character and plant associations. Additionally, 112 populations/occurrences of 28 rare plant taxa were located across the Hanford Site (TNC 1999).

Primary plant communities impacted by the fire included the following plant associations:

Antelope Bitterbrush-Wyoming Big Sagebrush/ Needle and Thread Grass: Big sagebrush is the dominant shrub, although bitterbrush (*Purshia tridentata*) commonly occurs at varying levels. Thickspike wheatgrass (*Elymus lanceolatus*) may occur in the understory. Cover of shrubs is generally relatively light, with a mosaic of openings in shrub canopy. In most sites, the highest cover of needle and thread grass (*Hesperostipa comata*) occurs where the shrub cover has been eliminated or suppressed by fire, such as south of Highway 24 in the north east portion of the Overlook fire.

Antelope Bitterbrush/Sandberg's bluegrass-Cheatgrass: Wyoming big sagebrush (*Artemisia tridentata*) is frequently present and sometimes co-dominant. This cover type sometimes occurs in interdunes with sorted fine-textured substrate, often with significant cover from Gray and green rabbit brush (*Ericameria nauseosus*, *Chrysothamnus viscidiflorus*) and snow buckwheat (*Eriogonum niveum*), and with some cover from Needle and thread grass and Indian Rice grass (*Hesperostipa comata*, *Achnatherum hymenoides*). Some areas with this cover type have a high cover of microbiotic crust, which is facilitated by north and neutral aspects, deposition of loess and slightly higher elevations. *Purshia tridentata* currently persists best in areas that don't burn regularly, probably due to low fuel loads or more protected positions in the landscape relative to ignition sources. Where *Eriogonum niveum* co-occurs, some open sand is indicated. (Easterly, R. and D. Salstrom 2004.)

Big Sagebrush/Sandberg's bluegrass-Cheatgrass: This community is primarily composed of Big sagebrush with an understory dominated by Sandberg's bluegrass (*Poa secunda*) mixed with cheatgrass (*Bromus tectorum*). While they often commingle, *P. secunda* and *B. tectorum* are frequently ecologically separated on a fine scale

(Easterly, R. and D. Salstrom 2004.), with Sandberg's bluegrass dominant over cheat grass in the slightly depressed intershrub areas and other areas with specific microclimates with slightly higher moisture, for example, in specific micro-topographic areas.

Spiny Hopsage- Wyoming Big Sagebrush/Sandberg's bluegrass: This community type is characterized by spiny hopsage (*Grayia spinosa*), Wyoming big sagebrush, Sandberg's bluegrass, and low forb diversity. The plant community type is apparently generally confined to locations with soils that are finer-textured than is typical for needle-and-thread associations.

Riparian: Wetlands created by Irrigation Run-off : This riparian community type includes lakeshores, riparian areas, and wetlands on the North Slope that have been converted from (or expanded onto) shrub-steppe habitat due to accumulated run-off from irrigated agriculture. The largest examples are just south and five miles south of Highway 24 on the eastern end of the Monument, including the WB (White Bluffs)-10 ponds. Communities in these wetlands are typically dominated by non-native species such as tamarisk and Russian olive, but also support native willows, cattails, black cottonwood, rose and tule. Although artificial or highly altered, these areas can provide valuable wildlife habitat, especially for amphibians, birds and bats in an otherwise arid landscape.

Riparian: Columbia River Shoreline: This riparian vegetation type includes the river shoreline, river bank and margins of the Columbia River. This type includes mixed native willow stands, isolated native black cottonwood trees, and stands of introduced species such as mulberry, black locust, catalpa, and poplar. These trees, although many are non-native, serve as a functional component of the riparian zone. For example, trees provide nesting habitat, perch sites and cover for many species of mammals and birds, and provide important components of habitat (i.e., shade) for aquatic invertebrates and juvenile fish.

Species diversity within each of the major community types has been altered in some areas due to the activities of neo-European people that entered the region beginning 200 years ago. In more recent history, alien plants were introduced and established a foot-hold in the shrub-steppe communities with the advent of livestock grazing in the mid-1800's and through agricultural cultivation and urbanization later in the century. More recently, this area has been extensively impacted by grazing activities including those administered by the Washington Department of Fish and Wildlife during the 1970's and 80's.

Vegetation within this area has also been altered through the establishment of cheatgrass within sage communities (see Areas of Cheatgrass Presence map- Appendix III) and the resulting shortening of the natural fire return interval. Historically, fire return intervals were between 50-100 years in the shrub-steppe region (Wisdom et. al. 2000). Fires burned in a complex mosaic pattern across the landscape leaving many healthy remnant stands of bunchgrass and sagebrush. These patterns allowed for the survival of healthy sagebrush communities and habitat for wildlife species.

However, with the current vegetation structure, cheatgrass provides ladder and bridge fuels for fire to quickly spread into and throughout big sagebrush communities, creating larger, more frequent fires that deplete the shrub component of the shrub-steppe habitat. In addition, cheatgrass matures and dries out early in the year, creating bridge fuel for much of the spring and summer. This often results in fires that occur earlier than historically and before many native grass species have entered summer dormancy, and may make them more vulnerable to mortality from the fires.

Riparian stands of vegetation experienced less severe fire impacts due to the high fuel moisture values because of the immediate and constant availability of water to the plant species in these areas. The spread of fire was also reduced because of areas of standing water in and around the ponds and along the river shoreline. Some of these areas had longer residence times because of the large fuel structures created by dense shrubs and trees. However, the fire behavior during these longer residence times was more of a smoldering burn characteristic of wet fuels rather than a hot or extreme fire behavior. Along the river shoreline many large trees that burned have fallen down, limiting the structure of the riparian zone along the river within the burned area. Within WB-10 pond, a previous fire from 2005 had impacted the riparian areas. Since 2005, many of the Russian olive trees had been treated with herbicide to facilitate the recovery of native species and to increase diversity of riparian plants within the fire area. These treatments have created dead material which was present to burn within the current fire footprint. This repeated burning has created a cumulative loss of trees and habitat structure within this riparian area.

3. Rare Plants

Emergency consultation was held with the U.S. Fish and Wildlife Service (USFWS) Ecological Services Office, Wenatchee, Washington on July 26, 2007 for threatened and endangered (T&E) species known to occur within the Overlook Fire area in Franklin and Grant, Counties, Washington. Species lists were obtained using the following web based address: <http://www.fws.gov/easternwashington/county%20species%20lists.htm>. A current list of species considered by the USFWS as Endangered, Threatened or as Species of Concern for the counties in which the fire occurred and GIS data layers of known rare plants for the Monument were consulted. Plant species listed by the USFWS that occur within either Franklin or Grant County and/or taxa considered Endangered Threatened or Sensitive in Washington (WNHP 2007) with known occurrences within the burned area are listed below; species known to occur within the

area burned by the Overlook Fire are in bold in the list.

<u>SPECIES</u>	<u>LISTING STATUS</u>
Ute Ladies'-tresses (<i>Spiranthes diluvialis</i>)	T/SE
Northern wormwood (<i>Artemisia campestris</i> ssp. <i>borealis</i> var. <i>wormskioldii</i>)	C/SE
White-bluffs bladderpod (<i>Physaria tuplashensis</i>)	C/ST
Gray Cryptantha (<i>Cryptantha leucophaea</i>)	FSC/SS
Hoover's desert-parsley (<i>Lomatium tuberosum</i>)	FSC/SS
Wanapum crazyweed (<i>Oxytropis campestris</i> var. <i>wanapum</i>)	FSC/SE
Great Basin Gilia (<i>Gilia leptomeria</i>)	ST
Dwarf evening primrose (<i>Camissonia pygmaea</i>)	SS
Desert dodder (<i>Cuscuta denticulata</i>)	ST
Snake River cryptantha (<i>Cryptantha spiculifera</i>)	SS
Piper's daisy (<i>Erigeron piperianus</i>)	SS

KEY TO LISTING STATUS:

E	FEDERAL ENDANGERED
T	FEDERAL THREATENED
C	FEDERAL CANDIDATE
FSC	FEDERAL SPECIES OF CONCERN
SC	STATE CANDIDATE
SE	STATE ENDANGERED
ST	STATE THREATENED
SS	STATE SENSITIVE

Through post fire reconnaissance and consultation with local experts, it was determined that **Ute Ladies'-tresses** and **Northern wormwood** were not affected by the fire because they have no habitat within or adjacent to the fire area, inventories prior to the fire determined their absence, and/or the fire is outside of the species range. Further, the habitat requirements of Ute Ladies'-tresses and Northern wormwood are restricted to natural wetland springs or cobble dominated riparian areas along the Columbia River; neither of these habitat types burned during the Overlook fire due to habitat not present or because of low fuel levels and proximity to water.

The **White bluffs bladderpod** is restricted to a specific association with caliche soils along the White Bluffs and was totally encompassed and burned over by the footprint of the fire. Given that fuels are sparse in much of the areas where this plant species exists and the likelihood that the plants had already dropped their seeds, negative impacts of the burn may be minor (P. Dunwiddie, personal communication). However, the elimination of surrounding vegetation, the potential for invasion by non-native species,

combined with erosion due to wind and precipitation over the winter months may result in larger impacts to this species than are currently anticipated. Further, fire rehabilitation plans may call for use of herbicides, reseeding efforts or other management actions that may influence the population of this species. This large, catastrophic fire is an unusual event that raises concern for this rare plant species. Survey to document the change in population due to the fire should be conducted as a high priority in 2008.

Gray cryptantha occurs on sandy substrate near the Columbia River within the Columbia Basin physiographic province. Associated species include pale evening-primrose (*Oenothera pallida*), needle-and-thread grass (*Stipa comata*), bitterbrush (*Purshia tridentata*), big sagebrush (*Artemisia tridentata*), Sandberg's bluegrass (*Poa secunda*), snow buckwheat (*Eriogonum niveum*), sulfur penstemon (*Penstemon attenuatus*), crouching milk-vetch (*Astragalus succumbens*), hoary chaenactis (*Chaenactis douglasii*), and cheat grass (*Bromus tectorum*). The taxon is basically restricted to areas where there is still some movement of sand, and would appear to be dependent on the strong winds of the region and the availability of open sand. Rare plant surveys within the fire area prior to the fire documented several locations of this rare species. Due to the nature of the sandy soils and relatively sparse vegetation in the habitat of this species, direct impact from the fire may be minor. However, the elimination of surrounding vegetation and the potential for invasion by non-native species, combined with erosion due to wind and precipitation over the winter months, may create larger impacts to this species than currently anticipated. Further, fire rehabilitation plans may call for use of herbicides, reseeding efforts or other management actions that may influence the population of this species. This large, catastrophic fire is an unusual event that raises concern for this rare plant species. Revisiting the known sites where this plant occurs over the next several growing seasons to document response of this plant to the fire should be a high priority for conservation of this species.

Hoover's desert parsley occurs only on loose talus habitats associated with basalt outcroppings and sparse vegetation, habitat not within the burned area. The known occurrences are located in Grant County west of the fire area, so it is not likely that this species was affected by this fire.

Wanapum crazyweed is known only from one location in Washington in an area some distance from the burned area, and therefore was not affected by this fire.

Great Basin gilia is found in very open habitats on gravelly bluffs, in sandy swales and on caliche from 470 to 1140 feet (143-347 m). This species occurs in semiarid regions in dry, gravelly or sandy, fine reddish to blackish basalt soils, or fine non-basalt gravel with caliche fragments. The substrate is sometimes hard-packed. The primary factor of the habitat for this species is the extreme dryness and lack of competition from other species. Because of the nature of the habitat for this plant, the fuels to carry fire in

these areas were light and the fire likely burned in a patchy manner within its habitat. Thus, negative impacts of the burn may be minor. However, the elimination of surrounding vegetation and the potential for invasion by non-native species, combined with erosion due to wind and/or precipitation over the winter months, may create larger impacts to this species than currently anticipated. Further, fire rehabilitation plans may call for use of herbicides, reseeding efforts or other management actions that may influence the population of this species. Because this species is an annual plant, yearly variation in population size is expected. However, a large, catastrophic fire such as the Overlook fire is an unusual event that raises concern for this rare plant species. Annual surveys for the next several years should be conducted in appropriate habitat to evaluate impacts from the fire on this rare plant.

Dwarf evening primrose (*Camissonia pygmaea*) is found on unstable soil or gravel in steep talus, dry washes, banks and roadcuts. The taxon occurs in habitats that are maintained in an open condition by erosion and the generally harsh environment. Because of the unstable nature of the habitat, and the annual habit of the taxon, it is probable that the number, size and location of the populations vary from year to year. There are few known sites of the species in WA, many of which are small in size. Negative impacts of the burn on this species are expected but unknown. The plants are out and identifiable from June through August, so the fire burned during the appropriate season to impact this plant this growing season and next growing season because the plant may not have reached the mature seeding stage at the time of the fire. Further impacts could result from the elimination of surrounding vegetation combined with the potential for invasion by non-native species. Erosion due to wind and/or precipitation over the winter months may also create larger impacts to this species than currently anticipated. Further, fire rehabilitation plans may call for use of herbicides, reseeding efforts or other management actions that may influence the population of this species. Because this species is an annual plant, yearly variation is expected. However, a large, catastrophic fire such as the Overlook fire is an unusual event that raises concern for this rare plant species. Annual surveys for the next several years should be conducted in appropriate habitat to evaluate impacts from the fire on this rare plant.

Desert dodder (*Cuscuta denticulata*) is parasitic on a variety of native desert shrubs throughout its range, and it occurs on various shrubs (*Artemisia* and *Chrysothamnus*) within desert areas. The elevation of the occurrence in Washington is 880 feet. Associated species at the currently known extant site include Wyoming big sagebrush, Sandberg's bluegrass, Indian ricegrass, and various native forbs with some cheatgrass. The burned site in Franklin County is currently the only known location of the species in Washington. Because this plant must exist on native shrub species it is likely that the Overlook fire severely impacted this species, as nearly all of the existing shrub cover within the fire footprint was eliminated by the fire. Sagebrush is not fire tolerant and will likely not recover in this area without active management. It may take 30 years or more to establish sagebrush plants that could support desert dodder. The known documented occurrence of this species should be revisited to assess the status of this rare species.

Snake River cryptantha (*Cryptantha spiculifera*) occurs on dry, open, flat or sloping areas in stable or stony soils, generally where overall cover of vegetation is relatively low. The plant is a perennial and it probably does not tolerate direct competition with other herbs nor is not able to endure the shade of shrubs or trees. The fire burned in a patchy manner through the areas where this species exists due to the low level of vegetation in the habitat where this plant occurs. However, because the species is sensitive to competition from other species, invasion of non-native species into the area disturbed by the fire is a concern. Erosion due to the elimination of vegetation due to the fire may also impact this species. Further, fire rehabilitation plans may call for use of herbicides, reseeding efforts or other management actions that may influence the population of this species. Known occurrences should be revisited and changes due to the fire noted and status of this rare plant should be evaluated.

Piper's daisy (*Erigeron piperianus*) is most common in undisturbed areas of the sagebrush steppe. This daisy occurs in dry, open places, often with sagebrush. It grows on level ground to moderate slopes of all aspects at elevations ranging from 400 to 2250 feet. The soil is typically well drained, and is generally somewhat alkaline. It occurs most commonly in the big sagebrush/bluebunch wheatgrass plant community type. The species response to periodic fires is not known. Recent information on Piper's daisy response to fire was gathered following the 24 Command fire of 2000. Post-wildfire monitoring from 2000 to 2004 on the Arid Lands Ecology Reserve within the Hanford Reach National Monument suggested that the abundance of Piper's daisy decreased following a large wildfire but gradually recovered over several (3-4 years) to pre-fire levels (TNC 2005). This information, however, was generated in an area that is relatively undisturbed and was able to regenerate post-fire with little other disturbance. The area of the Overlook fire is within a public access area and may be at risk of other disturbances in addition to the wildfire that could affect the ability of Piper's daisy to recover post-fire. Additional information to support or refute the information that was gathered following the 24 Command Fire would be helpful in assessing the impact of wildfire on this species.

In addition to the species listed above, there is potential for other species considered to be rare in Washington to occur in the area burned in the Overlook Fire. This includes species not known to occur in the state when the rare plant inventories were conducted, such as the ephemeral annuals *Loeflingia squarrosa* var. *squarrosa* and *Calyptidium roseum*. While evident rare plant habitat, such as caliche along the White Bluffs, was exhaustively surveyed, other more extensive habitat was sampled out of necessity because of the large amount of acreage covered during the inventory.

4. Vegetation/Structural Impacts

Vegetation resources were directly impacted by the Overlook Fire and by suppression tactics utilized to control the fire. Documented impacts to vegetation resulted from:

- a) Construction of 40 acres (based on 16 foot width) of dozer line and disc-line on previously undisturbed sites.
- b) Impacts to native microbiotic crust, shrub and grass species during line construction, suppression and mop-up activities
- c) Reduction of fuels and vegetation ahead of the fire-front (backfire operations).
- d) Vegetation losses due to fire intensity. Most sagebrush and grassland communities were completely consumed and/or scorched. Some additional loss is expected within the remaining shrub communities. Loss of riparian structure and understory shrubs in and around wetland ponds and along the Columbia River.
- e) Loss of the organic litter layer on approximately 90% percent of the fire area.
- f) Potential for invasion by aggressive non-native species throughout the disturbed site.
- g) Damage to structural improvements, (e.g. boundary fence) by suppression actions. Fences were cut or damaged.

Generally speaking, most sagebrush and bunchgrass communities experienced greater than 80-90% vegetation loss of above ground cover. On approximately 90% of the fire area complete consumption of vegetation resources was observed. Most shrub, grass, and forb species and organic material on the soil surface was consumed indicating extreme fire intensity.

A mosaic burn pattern within the shrub-steppe vegetation was observed and mapped on approximately 10% of the fire area. However, in these areas some loss of shrubs is still predicted to occur due to mortality from heat produced by the fire and seasonally dry weather conditions.

The riparian areas experienced a complete mosaic type burn with varying intensities. Occasional flare ups were recorded into the tree canopy, but generally moderate intensity burning in the understory, and some smoldering and low intensity burning in areas with standing water. Some emergent vegetation was only partially burned, incompletely burned or merely scorched. The estimated vegetation mortality in riparian was 50-60% with the majority of this occurring in the understory, while the tree canopy remained relatively unburned.

Most of the forb species were consumed. Although the fire burned at varying intensities across the landscape, in most cases the residency time of the fire was short enough so as not to damage the soil, existing root systems, or reduce native seed banks in the known habitats of these plants. Burying of native seeds through wind deposition of soils

or the remobilization of soil and seed bank to downwind dune settings now threatens the natural regeneration of native species in large portions of the sandy soil types. Negative impacts resulting from vegetation losses include a significant reduction in wildlife habitat, forage for wildlife species, visual quality degradation, potential for increased non-native species invasion, bare or windblown soils, and reduced species diversity. The loss of wildlife habitat and potential impacts to Threatened and Endangered Species are discussed further within the Wildlife Assessment.

Ground disturbing impacts to Monument property resulted from the creation of fire breaks using bull dozers and disks, and engines driving off road during suppression efforts. A complete inventory was conducted of disked lines and dozerlines on the fire area and emergency stabilization needs assessed (see Operations assessment).

Additional losses surveyed during field reviews were fire impacts on boundary fences. Boundary fences between the Monument and private lands were negatively impacted. Stretch posts and wire were damaged by the fire and will require repair. Boundary signs were also damaged by fire. (See Operations Assessment).

B. Vegetation Recovery

Revegetation of the fire area through natural processes will take between 7-30 years to visually represent pre-fire conditions. However, due to the presence of non-native plants and noxious weeds, the site is at risk of becoming dominated by non-native annuals, such as cheatgrass, Russian thistle and kochia, and aggressive perennial species such as yellow starthistle, rush skeletonweed, perennial pepperweed, Russian knapweed, diffuse knapweed, puncture vine and salt cedar. Without active restoration, it is unlikely that the site will recover to its pre-fire characteristics. Some impacted plant communities will take decades to re-establish back to pre-fire levels and some may be permanently altered. For example, most research indicates that fire eliminates spiny hopsage altogether, and sagebrush and bitterbrush for at least several years. Because big sagebrush does not sprout after fire and bitterbrush rarely sprouts in our area, recovery can be very prolonged on many sites. Of particular concern are the re-establishment of critical sagebrush communities for agency listed T&E wildlife habitat and the protection of the ecological integrity of the shrub-steppe community.

During the course of the fire, backfires were set (see Suppression Impacts map- Appendix III) to slow or stop the advancing fire front. In initiating this type of suppression action, native shrub-steppe habitat was lost thereby creating potential short and long-term impacts to T&E plant and wildlife species.

Other direct impacts to vegetation include the loss of shrub lands previously occupied by dense vegetation which are now open and traversable. The fire area is within an area open and accessible to the Public for recreation and this use could have negative impacts to wildlife, microbiotic crusts, government property, vegetation recovery, and cultural resources. Impacts to natural regeneration process and the protection of cultural

resources will be jeopardized if general public use within the fire area is not carefully controlled and monitored for the duration of the rehabilitation actions.

1. Noxious Weed Establishment

Invasive alien plant species pose one of the most serious threats to the native biodiversity, wildlife habitat, and scenic values which the Hanford Reach National Monument was declared to protect, and for which the entire Hanford Site is well known (Soll et al. 1999). At Hanford, and elsewhere in western North America, invasive and noxious alien plant species compete against and reduce habitat available for rare plant taxa and native plant species in general. Weeds alter ecosystem structure and function, disrupt food chains and other ecosystem characteristics vital to wildlife (including rare and endangered species), and can dramatically alter key ecosystem processes such as hydrology, productivity, nutrient cycling, and fire regime.

Conditions created by wildfire favor the spread of many noxious weed species (Evans, J.R., J.J. Nugent, and J.K. Meisel, 2003). The fire presents a large-scale disturbance and created new open sites vulnerable to weed invasion. This creates a fertile bed for the rapid colonization and spread of non-native species, especially coupled with the added nutrients from the ash. Thus, invasive species and noxious weeds which compete with the recovery native vegetation are likely become established and/or spread within the burned area.

Control of weed species known on the Monument was prioritized in the Weed Inventory and Management Plan (2003) based on the following criteria: aggressiveness, level/size of infestation, degree of ecological threat or impact, value of habitat surrounding weed infestations, and effectiveness of available control technologies. Priority 1 species that pose the greatest threat and require immediate control. Priority 2 species do not spread quite as rapidly as Priority 1 species, but are still of great concern. Priority 3 species are all other invasive species that are perceived as slightly less likely to threaten Monument resources but are still of concern.

During post-fire reconnaissance and field assessment, wildlife biologists recorded sightings of any non-native or invasive species. In addition, known infestations of invasive species of concern that are located within and near the burned area and their priority for control are listed in the following table. Several of these species are located within the fire area, and others are very near to the fire area (see Invasive Weeds map-Appendix III).

Species	Priority for control
Diffuse knapweed (<i>Centaurea diffusa</i>)	1
Yellow starthistle (<i>Centaurea solstitialis</i>)	1
Rush skeletonweed (<i>Chondrilla juncea</i>)	1
Scotch thistle (<i>Onopordium acanthium</i>)	1

Saltcedar (<i>Tamarix ramosissimus</i> , <i>T. parviflora</i>)	1
Puncturevine (<i>Tribulus terrestris</i>)	1
Russian knapweed (<i>Acroptilon repens</i>)	2
Whitetop (<i>Cardaria draba</i>)	2
Canada thistle (<i>Centaurea solstitialis</i>)	2
Russian olive (<i>Eleagnus angustifolia</i>)	2
Bull thistle (<i>Cirsium vulgare</i>)	3
Field bindweed (<i>Convolvulus arvensis</i>)	3
Kochia (<i>Kochia scoparia</i>)	3
Perennial pepperweed (<i>Lepidium latifolium</i>)	3
Purple loosestrife (<i>Lythrum salicaria</i>)	3
Common reed (<i>Phragmites australis</i>)	3
Swainsonpea (<i>Sphaerophysa salsula</i>)	3

All of these non-native plants and noxious weeds spread vigorously and pose significant threats in the burned area. It is therefore imperative to treat known populations prior to seed-set in order to reduce the expansion potentials of these populations into the burned area; immediate treatment is highly recommended.

Inventories for targeted invasive plant species throughout the Monument have been conducted on only 30,000 acres (>12000 ha) of the 195,000 acre Monument. These inventories were focused on areas where noxious weeds had been previously reported, on special habitats (e.g., natural springs) where certain target species are expected to occur, and in disturbed lands and dispersal corridors. Thus, not all of the Monument lands have been surveyed for noxious weeds and some key areas likely to harbor priority invasive species have NOT yet been inventoried. For example, riparian and aquatic habitat associated with irrigation wasteways and artificial impoundments within the burned area were only partially surveyed, and invasive species there are undoubtedly substantially underreported in the current Monument database. Thus, the burned area is likely to have undocumented occurrences of noxious weeds, and immediate, thorough surveys of the area are important to prevent their unchecked expansion.

The U.S. Fish and Wildlife Service uses an Integrated Pest Management (IPM) approach to treat targeted invasive plant species on the Hanford Reach National Monument. As part of this approach the Service has been working to create biological control (BioControl) reservoir and insectary sites across the Monument (see BioControl Reservoir and Insectary Sites map- Appendix III). Many of these sites were located within the Overlook Fire burn area, including 2 *Diorhabda elongata deserticola* (Fukang strain) sites (in 2 areas; for Saltcedar), 20 *Eustenopus villosus* sites (in 2 areas; for Yellow starthistle), 4 *Galerucella californiensis/G. pusilla* sites (in 3 areas; for Purple

loosestrife), 19 *Larinus planus* sites (in 9 areas; for Canada thistle), 3 *Larinus minutus* sites (in 1 area; for Diffuse knapweed), and 1 *Coleophora klimeschiella* site (for Russian thistle). One of the *Diorhabda* sites, all of the *Eustenopus* sites, 3 of the *Galerucella* sites, and 4 of the *Larinus planus* sites were completely destroyed in the fire. The target weeds will likely return, but the BioControls were likely completely extirpated. The remaining sites were impacted to varying degrees, which will have an unknown impact on the BioControls. In addition, *Puccinia chondrillina*, a rust fungus of Rush skeletonweed, and *Eriophyes chondrillae*, a bud gall-inducing mite of Rush skeletonweed, could be found on this plant species throughout the burn area. While the source of these infestations is not known, they were likely helping to keep the Rush skeletonweed in check on the Wahluke. The fire's impact to these BioControls is unknown but was likely significant as nearly all of the above-ground plant material that these two species rely on for reproduction and over-wintering was consumed in the fire. The weeds themselves will likely return during the next growing season.

Manual, mechanical, biological, cultural (e.g., prescribed fire, competitive plantings), and chemical treatment methods should be used within the fire area to achieve prioritized weed control objectives. Invasive species managers should draw upon the full range of appropriate control technologies to develop integrated treatment plans for target species at selected priority sites. Treatment methodologies should be based upon the best information available from weed management literature and professional experience, tailored to the characteristics of the particular species and site. In addition the BioControl reservoir and insectary sites should be replaced as soon as possible.

Upon the discovery of new noxious weed populations, accurate population information should be collected with Global Positioning Systems (GPS) to determine infestation size, original source and potential control methods. Control efforts should be implemented in accordance with the guidelines and protocols outlined by the Invasive Species Management Plan (Evans, J.R., J.J. Nugent, and J.K. Meisel, 2003).

2. Revegetation

Concern has been expressed over the loss of vegetation cover on the sandy soils of the Overlook fire area. Wind blown sand may present a hazard to residents to the east of the burn and to drivers along state highway 24 and Mt. Vista county road. Natural re-vegetation of areas with reactivated sand dunes will be slow and it will take many years to stabilize portions of these systems. Stabilization and re-vegetation of large portions of those areas is needed to ensure ecological function and to protect public safety along the road ways. Revegetation in the area should be conducted in order to protect soils in the area and to reduce the amount of change due to erosion and degradation of habitat.

Wind erosion and downwind dune formation is highly likely in this area. Additionally, because the site is at high risk from non-native species and noxious weeds, re-vegetation must be completed to protect the plant community and ecology of the site. As stated above, it is unlikely that the fire area will recover without some intervention and active restoration effort.

IV. RECOMMENDATIONS

A. Fire Suppression Rehabilitation:

Suppression account -Dozer/Disc line Rehabilitation- Drill-seed all disturbed areas resulting from suppression actions with native seed species to protect the ecological integrity of the area. Seeding will be postponed until fall of 2007 or until such time as adequate moisture provides a firm seedbed for stabilization actions.

B. Emergency Stabilization : (specification related)

The following recommendations are offered to assist in the timely recovery of the Overlook Fire:

3 Non-Native Invasive Species Control: Integrated Pest Management- Identify and treat non-native invasive species within the Overlook fire area, and control infestations in areas adjacent to the Overlook Fire area utilizing integrated pest management techniques. Re-establish biological control agents and sites within the fire area.

#-4 Ecological Stabilization: Native Grass Seeding- Apply native seed mix in burned area to stabilize ecological integrity of native shrub steppe community, prevent invasion by noxious weeds and non-native species, stabilize soils and reduce erosion that threatens public safety and site degradation. When possible and appropriate based on terrain and soils, drill-seeding is preferred, based upon preliminary results from the McLane and Weather Station fire stabilization/rehabilitation monitoring.

C. Rehabilitation (non-specification related treatments)

- Submit long-term rehabilitation plan as required to stabilize soils, control non-native invasive species and protect ecological integrity of the site.

D. Management Recommendations (non-specification related)

- Coordinate emergency stabilization needs with the Department of Energy and The Washington Department of Transportation to ensure public safety is protected along county roads and state Highway 24.
- Increase law enforcement patrols through the fire area until vegetation is re-established.

V. Consultations:

Debra Salstrom, SEE Botanical, Bellingham, Washington

Richard Easterly, SEE Botanical, Bellingham, Washington

Peter Dunwiddie, The Nature Conservancy of Washington, Seattle, Washington

Janelle Downs, Pacific Northwest National Laboratory, Richland, Washington

Michael Sackschewsky, Pacific Northwest National Laboratory, Richland, Washington

Greg Van Stralen, FWS, Wenatchee, Washington

VI. References:

Easterly, R. and D. Salstrom. 2004. Current vegetation map of Saddle Mountain, Wahluke and Ringold Units, Hanford Reach National Monument. SEE botanical consulting, Report to the U.S. Fish and Wildlife Service.

Evans, J. R., J.J. Nugent, and J. K. Meisel. 2003. Invasive Plant Species Inventory and Management Plan for the Hanford Reach National Monument. Report to U.S. Fish and Wildlife Service, The Nature Conservancy of Washington, Seattle, Washington.

The Nature Conservancy of Washington. 2005. Recovery and Rehabilitation of Vegetation on the Fitzner-Eberhardt Arid Lands Ecology Reserve, Hanford Reach National Monument, Following the 24 Command Fire. Final Report: 2001 – 2004.

The Nature Conservancy of Washington. 1999. Biodiversity Inventory and Analysis of the Hanford Site. Final Report. 1994-1999.

The Nature Conservancy of Washington. 1995. Annual Report. Biodiversity Inventory and Analysis of the Hanford Site.

Washington State Department of Natural Resources, 2000. Field Guide to Washington's Rare Plants.

Fire Effects Information System (FEIS)- National Interagency Fire Center Web Site

Proclamation 7319 of June 9, 2000. Establishment of the Hanford Reach National Monument.

National Wildlife Refuge System Improvement Act of 1997.

USFWS. Fire Management Handbook. Emergency Fire Rehabilitation Standards.

Joel G. Peterson. 1995. Ecological Implications of Sagebrush Manipulation.

C.A. Brandt et al. 1999. Plant Reestablishment After Soil Disturbance: Effects on Soil, Treatment, and Time.

Steven O. Link et al. 1990. Response of a Shrub-Steppe Ecosystem to Fire: Soil Water and Vegetational Change.

Wishom, M. L. et al. 2000. Source Habitats for Terrestrial Vertebrates of Focus in the Interior Columbia Basin :broad-scale trends and management implications. Gen. Tech. Rep. PNW-GTR-485. Portland, OR. U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 3 vol. (Quigley, T.M. Tech. Ed.; Interior Columbia Basin Ecosystem Management Project: scientific assessment).

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**BURNED AREA EMERGENCY STABILIZATION PLAN
OVERLOOK FIRE
WILDLIFE RESOURCE DAMAGE ASSESSMENT**

I. OBJECTIVES

- Assess effects of fire and suppression actions to Threatened, Endangered, Proposed and other significant state and federal agency listed species and their habitat, including birds, mammals, amphibians, reptiles, fish and insects.
- Initiate Emergency Section 7 Consultation as required by the Endangered Species Act.
- Assess effects of fire and suppression action to habitat improvements.
- Assess effects of proposed emergency stabilization actions to listed species and habitat.

II. ISSUES

- 15 agency (state and/or federal) listed wildlife species occur within the fire area, most of which are dependent on the shrub-steppe plant community.
- Potential effects to these species from the fire, suppression actions and potential post fire effects to shrub-steppe obligate species.
- Potential effects to these species from proposed emergency stabilization actions.

III. OBSERVATIONS

A. Background

The purpose of this Burn Area Emergency Stabilization (BAER) Wildlife Assessment is to document the effects of the fire, suppression actions, proposed emergency stabilization work, and potential post fire erosion, to all federally and state listed, agency sensitive and culturally significant mammals, birds, amphibians, reptiles, fish, invertebrates, and their habitats which may occur within or downstream from the fire area. This assessment also includes documentation on Emergency Section 7 Consultation, as required by the Endangered Species Act, with U. S. Fish and Wildlife Service. The species list is included in Appendix IV of this report. The species list for the fire area was developed by Heidi Newsome, Wildlife Biologist, U. S. Fish and Wildlife Service (FWS), Hanford Reach National Monument/Saddle Mountain NWR, in consultation with other agency and private biologists and experts. Species occurrence discussed in this assessment is based on formal surveys and habitat inventories conducted prior to the Overlook Fire, and post fire reconnaissance. Documents, inventory data, sighting records, vegetation maps and other species specific information referenced in this report are on file at the Monument office.

The Hanford Reach National Monument is located in the Pacific Flyway. Habitats within the fire area serve as nesting and resting areas for many species of migratory birds. The Hanford Reach National Monument includes habitat for many wildlife species, including 40 mammals, 246 birds, 4 amphibians, 9 reptiles, 49 butterfly taxa, 318 species of moths, and 52 taxa of aquatic macro invertebrates. Species diversity on the Hanford Reach National Monument can be attributed to the size, diversity and relatively undisturbed condition of the native shrub-steppe habitat.

B. Reconnaissance Methodology

Information used in this assessment is based on a review of relevant literature, agency management planning documents, agency wildlife sighting and habitat inventory data, communication with FWS, personal communication with agency biologists (listed at end of report), and reconnaissance of the fire area on July 13, 15, 16, 23, and 24, 2007. Habitat information and mapping for the various species is based on agency records and post fire reconnaissance. Reconnaissance and analysis included a review of other fires in the area to assess effects to species and vegetative recovery.

C. Findings

To better understand the species and habitat information discussed in this wildlife assessment, it is important to review the Overlook Fire BAER Vegetation and Soil Resource Assessment. That report contains more detailed descriptions of pre-fire vegetation, post-fire vegetative recovery estimates, and effects to the watersheds.

The purpose of this assessment is to discuss the potential effects of the fire, suppression actions and proposed emergency stabilization activities to federally and state listed and sensitive species which occur within the fire area. Effects to general wildlife species are not discussed. This assessment is not intended to definitively answer the many questions of effects to specific species that are inevitably raised during an incident such as the Overlook Fire. The focus of this assessment is to determine the potential for immediate, emergency actions that may be necessary to prevent further effects to these species. Because the species discussed in this assessment have ranges or territories which extend beyond the fire area, it may be important to include information at a larger scale, across land ownership boundaries, for species which may require assessment for long term rehabilitation or restoration needs.

BIOLOGICAL EVALUATION

Direct effects as described in this report refer to mortality or disturbances that result in flushing, displacement, harassment or mortality of the animal. Indirect effects refer to modification of habitat and/or effects to prey species.

SHRUB-STEPPE DEPENDENT WILDLIFE SPECIES

The community of plants and animals found in this area represents one of the largest remaining examples of the shrub-steppe ecosystem that once covered the Columbia River Basin. Termed a biological treasure, the Monument contains rare, rich and diverse shrub steppe ecosystem flora and fauna that has been lost elsewhere due to habitat conversion, fragmentation and application of pesticides. The shrub-steppe ecosystem supports an unusually high diversity of native plant and animal species, including significant breeding populations of nearly all steppe and shrub-steppe dependent wildlife. This area serves a critical role in contributing to the local, regional, national and international ecological integrity of the shrub-steppe ecosystem.

While fire has played an integral role in the history of the shrub-steppe environment, the region's historical fire regime has been greatly altered by socio-political and economic factors. Coupled with the arrival of invasive species and noxious weeds, this has weakened the natural recovery processes of the shrub steppe ecosystem from disturbance events such as fire. Several areas considered sensitive shrub-steppe plant communities were located within the fire perimeter. These vegetation communities provide rare and unique habitat that is critical for meeting FWS regional, national and ecosystem goals and objectives. Managing for biological integrity in this area necessitates that actions be taken to mitigate the ecological effects increasing fire frequency and intensity, and invasion of exotic species.

The Overlook Fire resulted in significant negative effects to plant communities through removal of approximately 90 percent of the sagebrush, antelope bitterbrush and associated plant cover. Sagebrush is a food source and/or provides nesting, resting, thermal and escape cover for a wide variety of species. Other value for wildlife includes the thick canopy which protects understory vegetation that can be a valuable food source for wildlife. Wildlife species in the fire area that are dependent on the sagebrush shrub-steppe and have federal or state listing status include: Ferruginous hawk, loggerhead shrike, sage sparrow, Washington ground squirrel, pygmy rabbit, black tailed jack-rabbit, sagebrush lizard and striped whipsnake. The fire also impacted riparian areas within the fire area.

CUMULATIVE FIRE IMPACTS ON THE HANFORD REACH NATIONAL MONUMENT:

The following assessment of wildlife species of concern follows several other assessments based on large wildfires within the Monument area. Burned areas have not had time to regenerate to the point of supporting some species of wildlife that depend on mature sagebrush. The cumulative impact of many large fires over a short time frame has increased the impact to these species within the Monument area (please see section on Cumulative Impacts, this report page 9 and 10).

Wildlife Species of Concern:

Overlook Fire Species List

On July 26, 2007, current species lists for the Overlook Fire area were obtained from U. S. Fish and Wildlife, Ecological Services Field Office in Wenatchee Washington, using the following web based address:

<http://www.fws.gov/easternwashington/county%20species%20lists.htm>. The Hanford Reach National Monument was declared on June 9, 2000. At that time, President Clinton directed the FWS to manage the Hanford Reach National Monument to protect all of the species associated with the shrub-steppe ecosystem. Included in the Memorandum of Understanding between FWS and DOE for management of the Hanford Reach National Monument, the primary objective of the FWS is to ensure that the Monument is operated and managed for the protection and preservation of the native shrub-steppe habitat and its associated wildlife species. The federal agencies are also charged with managing for species of importance to the Native American Tribes. Therefore, the following species are included in this assessment. This list was developed by Heidi Newsome. For plant species of concern see Vegetation Assessment.

<u>SPECIES</u>	<u>LISTING STATUS</u>
Ferruginous hawk, <i>Buteo regalis</i>	FSC/ST
Loggerhead shrike, <i>Lanius ludovicianus</i>	FSC/SC
Sage sparrow, <i>Amphispiza belli</i>	FSC/SC
Sage thrasher, <i>Oreoscoptes montanus</i>	FSC/SC
Greater sage grouse, <i>Centrocercus urophasianus</i>	C/ST
Burrowing owl (<i>Athene cunicularia</i>)	FSC/SC
Long-billed curlew, <i>Numenius americanus</i>	FSC/SM
Bald eagle, <i>Haliaeetus leucocephalus</i>	FSC/ST
Washington ground squirrel, <i>Spermophilus washingtoni</i>	C/SC
Pygmy rabbit, <i>Brachylagus idahoensis</i>	E/SE
Black-tailed jackrabbit, <i>Lepus californicus</i>	SC
Long-eared myotis (<i>Myotis evotis</i>)	FSC
Sagebrush lizard, <i>Sceloporus graciosus</i>	FSC/SC
Striped whipsnake, <i>Masticophis taeniatus</i>	SC
Mule deer, <i>Odocoileus hemionus</i>	TI

The following listed species were identified as occurring, or having habitat within Franklin and/or Grant County. Through post fire reconnaissance and consultation with local experts, it was determined that these species were likely not affected by the fire because they have no habitat within or adjacent to the fire area, and/or inventories prior to the fire determined absence, or the fire is outside of the species range or season of use, or the species is migratory through the area affected by the fire. For plant species of concern see the Vegetation Assessment.

Upper Columbia River Spring Chinook Salmon, (<i>Onchorynchus tshawytscha</i>)	E/SC
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Middle Columbia River Steelhead, (<i>Onchorynchus mykiss</i>)	T/SC
Upper Columbia River Steelhead, (<i>Onchorynchus mykiss</i>)	T/SC
Bull trout (<i>Salvelinus confluentus</i>)	
- <i>Columbia River distinct population segment</i>	T/SC
California floater (<i>Anodonta californiensis</i>), mussel	FSC/SC
Giant Columbia spire snail (<i>Fluminicola columbiana</i>)	FSC/SC
Columbian sharp-tailed grouse (<i>Tympanuchus phasianellus columbianus</i>)	FSC/ST
Kincaid meadow vole (<i>Microtus pennsylvanicus kincaidi</i>)	FSC
Northern goshawk, (<i>Accipiter gentiles</i>)	FSC/SC
Pallid Townsend's big-eared bat, (<i>Corynorhinus townsendii pallescens</i>)	FSC/SC
Northern leopard frog (<i>Rana pipiens</i>)	FSC/SE
Pacific lamprey (<i>Lampetra tridentata</i>)	FSC
Redband trout (<i>Oncorhynchus mykiss</i>)	FSC
River lamprey (<i>Lampetra ayresii</i>)	FSC
Western brook lamprey (<i>Lampetra richardsoni</i>)	FSC
Columbia clubtail (<i>Gomphus lynnae</i>), dragonfly	FSC
Elk, (<i>Cervus elaphus</i>)	TI

KEY TO LISTING STATUS:

E	FEDERAL ENDANGERED
T	FEDERAL THREATENED
C	FEDERAL CANDIDATE
FSC	FEDERAL SPECIES OF CONCERN
SC	STATE CANDIDATE
SE	STATE ENDANGERED
ST	STATE THREATENED
SS	STATE SENSITIVE
SM	STATE MONITOR
TI	TRIBAL IMPORTANCE

FERRUGINOUS HAWK

Ferruginous hawks are a federal species of concern, a federal Migratory bird of Conservation Concern (USFWS 2002) and a state Threatened species. Ferruginous hawks are migratory raptors that occur on the Hanford site during the breeding season from early March through August. The incubation period is 28-33 days with fledging at 44-48 days from the date the egg is laid. In 2007, there were two active nests approximately four miles from the burned area across the Columbia River on Central Hanford. The fire area is well within the foraging area for these active nesting territories. Further, there is one known historical nest location within the fire area, and four additional historical nest sites within 3 miles of the fire area (See Wildlife Species of Concern Map Appendix III). It should be noted, however, that nesting raptors are not monitored every year on the Monument, and historic nest locations may be re-used in later years. Ferruginous hawks do demonstrate nest site fidelity, returning to the same

nesting territories in subsequent years. The fact that some territories within and adjacent to the fire area were not used during this season does not mean they would not be viable in future years. Many territories in Eastern Washington are unoccupied due to the current decline in the population of Ferruginous hawks in Washington. Available nesting territories are not currently thought to be limiting the population and, if the population rebounds, currently unoccupied areas may become occupied (Watson 2003). Ferruginous hawks are sensitive to human presence, and will abandon their nests if subject to human encroachment. Activities (especially noisy ones) near nesting sites should be limited during the breeding and fledging season.

Ferruginous hawks prey on a variety of mammals, birds, reptiles and insects, depending upon local area and prey abundance. These hawks may forage up to 15 km (approximately 9 miles) from their nest site; however, nest success may be greater in areas where abundant forage is in close proximity to the nest location. Areas where prey densities are high generally have greater successful nesting attempts. The average home range size of Ferruginous hawk in Washington state may be as large as 7,660 acres (31 sq. km = 11 sq. miles), based on hawks traveling considerable distances to forage (WDFW 1996).

FIRE IMPACTS: The entire 21,233 acres of the Overlook Fire can be considered Ferruginous hawk habitat. This loss is combined with cumulative losses due to repeated fires on the Monument area (please see section on Cumulative Impacts page 9 and 10 this report). Impacts to Ferruginous hawks from the Overlook Fire are indirect and include a reduction of habitat diversity that supports prey for Ferruginous hawks, reduction of habitat for foraging and nesting Ferruginous hawks, and reduced potential for this historic nesting area to be re-occupied in future years. The Washington Department of Fish and Wildlife considers the Ferruginous hawk a priority species for management and recognizes that they benefit from land-use practices that ensure an adequate prey base. WDFW recommends that Landowners/managers should protect shrub-steppe and grassland habitats that harbor significant populations of small mammals and other prey (Richardson et. al. 2004). Further, WDFW recommends reseedling of native plant species after chaining or burning to promote habitat stability and to benefit Ferruginous hawk prey populations (Richardson et al. 2004, Olendorff 1993). Therefore, stabilization and rehabilitation of the habitat lost in the Overlook fire in and around the historic nest location is essential, to support an abundance of prey species, and to develop critical foraging and nesting habitat for the Ferruginous hawk. Stabilization and rehabilitation of suitable habitat for nesting and foraging around these historic nest sites is likely critical for the recovery of this species in Washington state.

LOGGERHEAD SHRIKE

The Loggerhead shrike is a neo-tropical migrant species that breeds on the Monument. Loggerhead shrikes are a federal species of concern, listed as a Migratory bird of Conservation Concern (USFWS 2002), and are a state Candidate for listing as a Threatened species. There are documented sightings of shrike in the fire area during the breeding season (See Avian Habitat and Sensitive Wildlife Maps). Further, it is likely that there were additional breeding territories in the fire area based on habitat prior

to the fire and the fact that this area has not been systematically surveyed for shrikes. Nine shrikes were seen during post fire reconnaissance (see photo documentation).

Loggerhead shrikes are common on the Hanford site from early March until the end of August. After August numbers are reduced but individuals have been sited through early November. Loggerhead shrikes require mature sagebrush, or other shrubs, for breeding and foraging habitat. Shrikes are most abundant in habitats of relatively high horizontal and vertical structural diversity (Poole 1992). This species builds its nest within shrubs, and requires some sort of shrub or other habitat feature when foraging for impaling its prey. The species is well known for its unusual and complex behavior of impaling prey on sharp objects in conspicuous places or wedging prey in narrow V-shaped forks (Yosef 1996). The primary prey items of this species are insects (e.g., beetles, grasshoppers), although small mammals, small birds, and lizards are also taken as prey (Yosef 1996). Loggerhead shrikes are highly territorial, and they exhibit a high level of nest site/territory fidelity. Poole (1992) found that shrikes defended territories averaging 34.4 acres (± 4.9 ac) on the Hanford Site in Washington. Also on the Hanford Site, of 113 territories studied, 96% were reoccupied the following season (Poole 1992). Shrikes remain in breeding territories as fledglings for 3-4 weeks after leaving the nest. This post fledging period is the time of highest mortality for shrikes, when young birds are weak fliers and are vulnerable to predation (Poole 1992). The Overlook fire burned during this critical time period.

The Loggerhead shrike is one of the few North American passerines whose populations have declined continent wide in recent decades (Yosef 1996), and in Washington Breeding Bird Survey data for the Columbia River Basin shows a significant decline in the shrike population over the last 26 years (Vander Haegen 2004). Burning and wildfires may create the greatest risk to local shrike populations because the damage is immediate and regeneration to pre-burn condition may take up to 30 years (Harniss and Murray 1973).

FIRE IMPACTS: The 21,233 acres of shrub-steppe habitat that was burned in the Overlook fire can be considered habitat for Loggerhead shrike, 10,015 acres of that area can be considered high quality breeding habitat (see Vegetation map – Sage cover Appendix III). This loss is combined with cumulative losses due to repeated fires on the Monument area (please see section on Cumulative Impacts page 9 and 10 this report). Impacts from the Overlook fire to the shrikes are both direct and indirect and include greater mortality to fledgling young in the fire area due to loss of hiding cover, loss of prey base, loss of habitat for nesting and foraging, and loss of structural diversity of habitat required for shrike use of the area. Because shrikes exhibit fidelity to nesting territories, individuals that attempt to return to former territories in subsequent breeding seasons will find them void of nesting cover and structure. Additionally, displacement of individual breeding pairs into other areas may increase inter- and intraspecific competition for nesting territories. If suitable habitat areas were already occupied by breeding pairs, displaced pairs may not be able to locate territories, or will be forced to utilize marginal habitat types. Breeding success would likely decline for pairs that have been displaced by fire impacts to their breeding habitat. Nine individual Loggerhead

shrikes were observed during post-fire reconnaissance.

The Washington Department of Fish and Wildlife considers the shrike a priority species for management and provides the following management recommendations for loggerhead shrike habitat: retain shrub-steppe communities, especially big sagebrush and mixed shrub communities, avoid wildfires and activities that may increase invasion by exotic vegetation, avoid management activities that increase cheatgrass invasion or increase risk of wildfire (Vander Haegen 2004, Leu and Manuwal 1996). Stabilization and rehabilitation of the habitat within the fire area is critical for Monument management of this declining species.

SAGE SPARROW

Sage sparrows are a federal Migratory bird of conservation concern (USFWS 2002), and a state Candidate for listing as a threatened species. Sage sparrows are a migratory sparrow present in the Columbia Basin during the breeding season from early February until the end of September. Sage sparrows prefer semi-open habitat with evenly spaced shrubs 1-2 meters high (Martin and Carlson 1998). This species is associated with sagebrush throughout its range. Sage sparrows forage on the ground for seeds and invertebrates. On the HRNM/SMNWR, sage sparrows are abundant in areas that retain big sagebrush communities. The Hanford Site, along with the Yakima Training Center to the west, supports the largest contiguous habitat patches in Washington for this state Candidate species. Exceptional habitats with apparent high densities of Sage Sparrows are found in big sagebrush stands along the base of the Saddle Mountains, throughout sagebrush habitats on the Columbia River plains, and within Central Hanford. Sage sparrows are confirmed breeders on the site, and they frequently raise more than one brood per season. They are territorial and exhibit site fidelity to nesting territories. Flocks of juveniles are frequently observed along roadsides from late May throughout the beginning of August.

FIRE IMPACTS: The 21,233 acres of shrub-steppe habitat that was burned in the Overlook fire can be considered habitat for sage sparrow, 10,015 acres of that area can be considered high quality breeding habitat (see Vegetation map – Sage cover Appendix III). This loss is combined with cumulative losses due to repeated fires on the Monument area (please see section on Cumulative Impacts page 9 and 10 this report). Adult sage sparrows had probably initiated their second or third nesting effort; these nests were probably destroyed by the fire. Although sage sparrows are mobile animals, their individual behavioral site fidelity to their nesting territories may have increased their susceptibility to direct loss during the fire. Large flocks of juvenile sage sparrows are generally observed during this time period. These recently fledged birds may have been displaced due to the fire. The big sagebrush vegetation within the burn area experienced mortality of 90 percent of the sagebrush plants. Therefore, virtually the entire available sage sparrow habitat in the fire area was lost as a result of the fire. Due to the loss of shrub cover, surviving adult birds with established territories likely returned to a highly altered habitat condition. These birds were most likely displaced due to the fire. Because sage sparrows exhibit fidelity to nesting territories, individuals that

attempt to return to former territories in subsequent breeding seasons will find them void of nesting cover and structure. Additionally, displacement of individual breeding pairs into other areas may increase inter- and intraspecific competition for nesting territories. If suitable habitat areas were already occupied by breeding pairs, displaced pairs may not be able to locate territories, or will be forced to utilize marginal habitat types. Breeding success would likely decline for pairs that have been displaced by impacts to their breeding habitat from the fire.

The increasing frequency and intensity of range fires in Great Basin pose significant threat to native grasses and shrubs. Historically, fires were infrequent, and perennial grasses and shrubs were not adversely affected. With increased fire frequency, native plants are killed and seed reservoirs of grasses and shrubs are depleted and replaced with exotic annuals, such as cheatgrass (*Bromus tectorum*). Sage Sparrows abandon former habitats once invaded by cheatgrass (Martin and Carlson 1998). Thus, replacement of native vegetation by cheatgrass in areas disturbed by the fire will decrease the available habitat for sage sparrows. Because sage sparrows require open areas and bare ground for foraging, changes in vegetation structure and loss of sagebrush due to the fire will impact foraging by sage sparrows. Stabilization and rehabilitation of this area to prevent the spread of cheat-grass and to replace lost shrub habitat is essential to maintain this area for sage-sparrows.

SAGE THRASHER

Sage thrashers are a neotropical migratory bird species present on the Hanford Reach National Monument in low numbers from early April through September. A Washington State Candidate species, the sage thrasher is found on the Monument primarily in patches of big sagebrush and three-tip sagebrush. The sage thrasher is a species that is highly dependent on healthy shrub-steppe communities comprised of tall, dense sagebrush (*Artemisia* spp.). Sage thrashers are closely associated with sagebrush and are considered obligates of sagebrush communities (Vander Hagen 2003).

In order to maintain sage thrasher populations, shrub-steppe communities should be left in reasonably undisturbed condition and fragmentation should be minimized. Management activities that increase cheatgrass invasion or increase risk of wildfire also must be avoided (Vander Hagen 2003). Burning may lead to serious negative impacts to local sage thrasher populations because the damage is immediate and regeneration to pre-burn condition may take up to 30 years (Harniss and Murray 1973).

FIRE IMPACTS: Sage thrashers are mobile animals and would have been able to move out of the fire area. Dense sage areas on the Wahluke Unit of the Monument provide sage thrasher habitat. The Overlook fire burned through the eastern portion of the Wahluke unit, and the majority of the mature sagebrush was lost due to the fire. A total of 10,015 acres of sage brush habitat within the burned area experienced a mortality of 80 to 90 percent of the sagebrush plants. This loss is combined with cumulative losses due to repeated fires on the Monument area (please see section on

Cumulative Impacts page 9 and 10 this report). The elimination of sagebrush within the fire area will have long term impacts for sage thrashers. All available habitat within the burned area (mature sage brush) was impacted by the fire. Long term effects will include displacement of sage thrashers from the burn area. It is anticipated that this species will not return until the sagebrush recovers to maturity and provides the necessary habitat structure to support sage thrashers. It is unknown if potential re-colonizing populations exist nearby.

GREATER SAGE-GROUSE

Greater sage-grouse are listed as a state Threatened (Washington) and the Columbia Basin distinct population segment is a candidate for federal listing as threatened . Two small, disjunct remnant populations of sage grouse occur in Washington State. One population is in Douglas County approximately 75 miles north of Hanford, and the second is on the Army's Yakima Training Center (YTC) in Yakima and Kittitas Counties just northwest of the Hanford Site. The Douglas County population is estimated at roughly 600 birds and the YTC population at roughly 200 birds. As recently as 1999 the YTC population appears to have begun to expand into that portion of the Monument included in the ALE Unit. Several sage grouse sightings were made in 1999 and 2000 in the vicinity of Rattlesnake Springs and Benson Ranch. However, no recent sightings have been recorded on the Wahluke unit of the Monument.

Greater sage-grouse nesting habitat in southeastern Washington is primarily sagebrush-steppe vegetation that is of relatively high quality (dominated by native species). Sagebrush intermixed with tall bunch grasses provides cover required for successful nesting. Brood rearing habitat includes the shrubs and tall grasses for escape cover, but also must include a mix of native forbs that provide both insects and high protein vegetation. Sagebrush is an essential element for sage grouse during the late fall, winter and early spring, when the leaves of sagebrush make up as much as 99% of the birds' diet.

An interagency working group was established in 1998 to assist with the recovery of the sage grouse in Washington. Several agencies (U.S. Army, U.S. Fish and Wildlife Service, the Washington Department of Fish and Wildlife, the U.S. Department of Energy, and the Yakama Nation) are working to preserve and restore sage grouse in eastern Washington State. It is noteworthy that the Hanford Site property (Monument area) was identified as one of the few large land areas having contiguous and high quality habitat suitable for sage grouse recovery and expansion.

FIRE IMPACTS: Loss of habitat (nesting habitat, winter and summer shelter habitat, escape cover losses and food resources lost). Recovery of sage grouse habitat in this area will probably take many years. In addition, the forbs and invertebrates which are the preferred food for this species were effectively eliminated throughout most of the fire area. Regionally, the loss of 21,233 acres of sagebrush habitat represents a significant decrease of suitable habitat for this species. This recent fire, when combined with several other large fires on the Monument area over the past seven years, has

impacted over 100,000 acres of potential grouse habitat on the Monument. The cumulative impact from these fires on the habitat condition for sage grouse cannot be overstated. This cumulative habitat loss may delay or prohibit recovery of the western sage grouse in the State of Washington.

Due to the significant amount of habitat lost, and because any remaining sagebrush does not occur in the large blocks apparently needed for survival, it is expected that this area will not support sage grouse for 30 or more years. The arid nature of the site may further delay recovery because germination and growth of shrub species depends upon amount and timing of available moisture.

BURROWING OWL

Burrowing owls are a federal species of concern, a Migratory bird of Conservation Concern (USFWS 2002), and a state candidate species, and a state priority species. Although, there are no known currently active burrows within the fire area, there are 11 historic burrows and several locations of Burrowing owl within and adjacent to the fire area (see Heritage Locations map- Appendix III). Prior to the fire, this area was considered potential habitat for burrowing owls, and although the fire area had not yet been systematically surveyed for burrowing owls, the Monument biology staff had a planned call survey route through the area.

Burrowing owls are small ground-dwelling species associated with dry, open, short grass, or desert and are often linked with burrowing mammals. Foraging areas are typically short grass dominated habitats; food items include predominately invertebrates and small mammals, and occasionally small birds and reptiles. Within the Columbia Basin, Western burrowing owls are primarily migratory and are present from February through early August, although a few individuals over-winter. The Western burrowing owl is thought to be declining throughout central Washington and much of its range in North America. It is also apparently declining at the Hanford Site. Once thought relatively common, burrowing owls are now rarely observed. The regional decline of ground squirrels, which provide nesting sites for these owls, is possibly linked with the apparent decline in owl populations. The potential decline in population is not unique to the Monument and may be characteristic of the species population trend throughout eastern Washington. Loss and degradation of habitat throughout the Columbia Basin from a variety of factors, including wildfire, has likely contributed to the decline of this species.

FIRE IMPACTS: Impacts to Burrowing owls from the Overlook Fire are indirect and include; impacts to invertebrate and small mammal prey populations, a reduction of habitat diversity that supports prey for Burrowing owls, and reduction of habitat for foraging Burrowing owls. The elimination of shrubs effectively reduces almost all natural perch locations for Burrowing owls. Shrubs are also important to Burrowing owls as thermal cover, adults and juvenile owls seek thermal cover in the shade of shrubs during mid-day periods. Further, elimination of shrub cover may expose small mammals to higher predation rates and consequently may reduce the local abundance

of small mammals. Burrowing owls are also prey for other raptor species. Reduced plant biomass, and loss of cover could result in a higher predation rate on individual burrowing owls within the burn area. Loss of a total of 13,732 acres of a diversity of shrub species from the landscape will impact burrowing owls. This loss is combined with cumulative losses due to repeated fires on the Monument area (please see section on Cumulative Impacts page 9 and 10 this report). Clearly, stabilization of the grassland and shrubland habitat that supports burrowing owls will make this area more viable as Burrowing owl habitat in the future. Without stabilization and rehabilitation, it is unlikely that Burrowing owls would use this area in the future.

LONG-BILLED CURLEW

The long-billed curlew is a large shorebird species that breeds in the sage-steppe and grassland environments of the Basin Regions of North America. The long-billed curlew is categorized as “highly imperiled” in the U.S. Shorebird Conservation Plan due in part to historic and current population declines, and is a federal Species of Concern and a state monitor species in Washington. It is also a priority species for the Refuge Complex and Monument area. The greatest density of breeding Long-billed Curlew is in the northern Great and Columbia basins. However, much of remaining U.S. nesting habitat is highly disturbed, as over-grazing and burning has rendered grassland habitat vulnerable to invasion and subsequent dominance by non-native plant species. The long-billed curlew is an obligate of grasslands and open shrub areas, but will also use open areas in riparian/wetland habitats and agricultural fields while feeding. It feeds primarily on insects and arachnids, and occasionally on baby birds and rodents. Long-billed curlews are known to nest within the fire area. They select sparse, mixed stands of bluegrass and cheatgrass, or shorter stature bunchgrasses with a low percentage of shrub cover for nesting. Curlews typically arrive in March and nest at low density throughout the Columbia basin region.

FIRE IMPACTS: Breeding long-billed curlew generally have migrated south during June. No long-billed curlews were observed during post fire reconnaissance. Curlew were likely not in the area at the time of this fire. However, indirect impacts from the fire to long-billed curlew habitat were noted. Because this species nests in grasses, loss of shrub cover is not a critical impact for their breeding habitat. Because grasses will return as early seral species in subsequent years, and in areas where brush was removed, potential breeding habitat may be increased. However, insect prey species were decreased by the fire. Prey abundance may be impacted into the next breeding season. Because of the loss of diversity of plant types and vegetation structure, the abundance of prey and species diversity, may change due to the fire. This change may influence the ability of Long-billed Curlew to successfully nest within the fire area.

BALD EAGLE

Bald eagles breed throughout most of the United States and Canada, with the highest concentrations occurring along the marine shorelines of Alaska and Canada. They winter throughout most of their breeding range, primarily south of southern Alaska and Canada. In Washington, bald eagles nest primarily west of the Cascade Mountains,

with scattered breeding areas along major rivers in the eastern part of the state. Wintering populations are found throughout the Puget Sound region, the San Juan Islands, Hood Canal, the Olympic Peninsula, and the upper and lower Columbia River and its tributaries. Major wintering concentrations are often located along rivers with salmon runs. The bald eagle is a State Threatened species in Washington. However, it's status may be reviewed and changed due to the recent federal decision to remove the Bald Eagle from federal listing as a Threatened species due to it's overall rangewide recovery. Eagles are vulnerable to loss of nesting and winter roost habitat and are sensitive to human disturbance, primarily from development and timber harvest along shorelines. Eagles use the Hanford Reach primarily during the winter months and are present from October through March.

FIRE IMPACTS: The loss riparian habitat within the fire area (1,340 acres) and, in particular the loss of large trees along the Columbia River riparian zone that burned during the Overlook fire, will impact wintering Bald Eagles along the Hanford Reach. Wintering eagles select day perches according to their proximity to food sources (Steenhof et al. 1980). Perch trees tend to be the tallest available, and eagles will consistently use their preferred branches. A variety of tree species, both alive and dead, are used for perching (Stalmaster 1976). Bald eagles may roost communally in winter, with three or more eagles perching consecutive nights in the same trees. Communal roosting probably enhances food-finding in nearby foraging areas (Knight and Knight 1984). The Overlook fire burned several large trees along the Columbia River shoreline that have been used as perch or roost sites by Bald Eagles. Many of these trees were felled following the fire and are no longer available for wintering eagle use. This may impact eagle foraging and energetics during the winter months. Restoration of the riparian area trees along the Columbia River shoreline will be important for wintering Bald Eagles.

WASHINGTON GROUND SQUIRREL

This area is also potential habitat for the Washington Ground Squirrel, a federal and state candidate for listing as a Threatened species. Approximately 8,613 acres within the fire area could be considered potential habitat for Washington ground squirrel based on analysis of vegetation and soils (J. Meisel unpublished data 2005). The Washington ground squirrel is a brownish-gray squirrel with conspicuous white spots on the dorsum. This species occurs only in Washington east of the Columbia River. It prefers sandy soils in dry, open, sagebrush and grassland habitats. This species hibernates 7-8 months per year from June/July through January/February. These squirrels eat succulent vegetation and bulbs in early spring and seeds in the early summer. Burrows are usually about ≤ 3 inches in diameter and entrances are often hidden under bushes or rocks (Yensen and Sherman 2003). There are no known burrows within the fire area; however this area has not been thoroughly surveyed to date. Regionally, the loss of 8,613 acres of potential habitat represents a significant decrease of suitable habitat for this species. This loss is combined with cumulative losses due to repeated fires on the Monument area (please see section on Cumulative Impacts page 9 and 10 this report). This habitat loss may delay or prohibit recovery of the Washington ground squirrel in the

State of Washington.

FIRE IMAPCTS: Any Washington ground squirrels within the fire area would have been hibernating during the fire. However, depending upon heat and fire intensity, animals may have suffered mortality within their burrows. The removal of shrub cover will impact the habitat for Washington ground squirrels which require shrubs for hiding cover as protection from predation. Further, the potential conversion of native bunch grass areas to annual grasses (cheat grass) will impact the habitat for Washington ground squirrels. Habitat degradation of rangelands and shrub-steppe areas is recognized as a major cause of decline in this species (Yensen and Sherman 2003). Stabilization and rehabilitation of the area is important to maintain the potential for the area to eventually support Washington ground squirrels.

COLUMBIA BASIN PYGMY RABBIT

This species is extremely rare in Washington, occurring only in the Great Basin portion of the Lower Columbia Basin and was emergency listed as a Federally endangered species in November of 2001. The pygmy rabbit is limited to habitat types which contain tall dense sagebrush and specific soils with limited content of sand for constructing its burrows. Field observations of the pygmy rabbit indicate heavy reliance on sagebrush, primarily on the seed heads and vegetative leaders. Pygmy rabbit diet is comprised of 99% sagebrush in winter and 51% in summer.

FIRE IMPACTS: Prior to the fire, this area of the Wahluke Unit supported approximately 7,500 acres of potential habitat for Columbia basin pygmy rabbit (see Impacted Potential Pygmy Rabbit Recovery Habitat map- Appendix III), based on a GIS analysis of soils and vegetation (J. Meisel, M.S. thesis, 2006). The stabilization of sagebrush cover in this area is critical to developing potential habitat and reintroduction areas for pygmy rabbit. This area may be important for the eventual recovery of pygmy rabbit in Washington. Regionally, the loss of 7,500 acres of potential habitat represents a significant decrease of suitable habitat for this species. This loss is combined with cumulative losses due to repeated fires on the Monument area (please see section on Cumulative Impacts page 9 and 10 this report). This habitat loss may delay or prohibit recovery of the pygmy rabbit in the State of Washington.

BLACK-TAILED JACK RABBIT

The entire 21,233 acres of the Overlook fire can be considered black-tailed jackrabbit habitat. The black-tailed jackrabbit was once abundant throughout the Columbia Basin. Recent precipitous declines in populations of these hares have raised concerns regarding their distribution and status throughout the region. This species is closely associated with the sagebrush steppe ecosystem. Black-tailed jackrabbits rely on sagebrush structure for breeding sites and hiding cover, and require sage-brush vegetation as forage during winter months. Black-tailed jackrabbits breed from late February to mid-July, with gestation lasting 41 to 47 days (Flinders and Chapman 2003). They can have two to six litters per year, with local populations likely tending towards the low end of this scale (Flinders and Chapman 2003). Hares, unlike rabbits,

do not use burrows. They place their young in shallow depressions in the soil called forms. Jackrabbits are generally solitary and primarily nocturnal. They are vulnerable to predators including, coyotes, bobcats, foxes, hawks, owls, and snakes. Loss of habitat due to agricultural and human development has impacted jackrabbit populations. The fragmentation and isolation of populations residing within remnant habitat areas has probably increased their vulnerability to stochastic events (e.g. severe weather, disease, fire, etc.) and has limited the re-colonization of areas that could potentially support jackrabbit populations.

FIRE IMPACTS: Black-tailed jackrabbits are known to be relatively fast moving animals. Because these animals are highly mobile, it is anticipated that they would have been able to move out of the way of the fire. However, recently birthed young were likely consumed in the fire as they would not have been able to flee. Black-tailed jackrabbits are primarily nocturnal and six rabbits were observed during fire suppression operations. The loss of sagebrush structure and cover reduces the amount of hiding cover for this species, and will increase the vulnerability of jackrabbits to predation. Additionally, the loss of a significant continuous stands of sage exacerbates this effect, because smaller patches do not provide escape cover. If jackrabbits are chased out of the remaining small patches of cover, they will be forced into the open burned over areas and be easily captured and consumed. Impacts to the local jackrabbit population will also affect those animals that prey on jackrabbits, as jackrabbit numbers decrease there will be less forage for other animals that prey upon jackrabbits. The habitat lost due to the Overlook fire when combined with cumulative losses due to repeated fires on the Monument area (please see section on Cumulative Impacts page 9 and 10 this report) represents a large impact to black-tailed jackrabbits and may impact their continued persistence within the Monument area. Stabilization and rehabilitation is critical to maintaining viable habitat on the Monumnet for this species.

LONG-EARED MYOTIS

This bat species is actually found in a wide range of habitats from arid grasslands to moist coastal forests. This species is a generalist in its eating habits, it feeds heavily on small moths but also eats flies, beetles, and other insects. During the day, Long-eared Myotis may roost under bark, in rock crevices and hollow trees. The females will form small maternity colonies and seem to prefer buildings during this time. It has been noted that occasionally a male will join the colony. But in general, little is known about the behavior and biology of this species. There is no information on hibernation sites for *M. evotis*. *Myotis evotis* appears to be widespread throughout the western states, but not abundant. Because of lack adequate information on both behavior and populations of this species, these bats are listed as a 'Species of Concern'.

FIRE IMPACTS: Due to the loss of riparian habitat and trees around the WB-10 ponds and along the Columbia River within the Overlook fire area, the habitat for bat species is likely impacted due to the decrease in availability of appropriate roost sites. Bats also prefer riparian areas for foraging and the fire likely impacted the foraging areas for bats.

SAGEBRUSH LIZARD

The Sagebrush lizard is a federal species of concern and a state candidate species for listing as a threatened species. Sagebrush lizards emerge from hibernation in April. Mating occurs in April and May, and females lay their eggs in June, burying them in loose soils at the base of a shrub. Hatching normally occurs in August (Storm and Leonard 1995). Recent research in Oregon suggests that the Sagebrush lizards are limited to habitats that have sandy soils. In Washington, all recently confirmed sites are associated with sand dunes or other sandy habitats (Hallock and McAllister 2005). A significant portion of the fire area qualifies as habitat for the sagebrush lizard, based on soils and vegetation types (see Maps of Soils and Sensitive Wildlife –Appendix III). The Washington Department of Fish and Wildlife recommends that any activities that alter these habitats, such as conversion to agriculture and/or activities that promote the invasion of cheat grass (*Bromus tectorum*), are likely detrimental to Sagebrush lizard populations (Hallock and McAllister 2005). Therefore, preventing encroachment by cheat grass post fire is important in maintaining the habitat for Sagebrush lizards within the fire area. Stabilization of the fire area with native grass species will be important for management of this species.

FIRE IMPACTS: The 19,743 acres of upland shrub-steppe habitat within the fire perimeter of the Overlook fire can be considered Sagebrush lizard habitat, with 17,277 acres of this area being considered high quality breeding habitat for Sagebrush lizard (based on Soils; see Soils map and wildlife species of concern map – Appendix III). This loss is combined with cumulative losses due to repeated fires on the Monument area (please see section on Cumulative Impacts page 9 and 10 this report). The lizard young were probably small hatchlings, and it is likely that within the fire area, young of the year were lost during the Overlook fire. Adult lizards may have also been lost in the fire because they seek shelter within shrubs. Shrubs have longer fire residency times and burn hotter than surrounding grasses, and therefore lizards likely experienced direct mortality. Those adult lizards that survived the burn are probably now exposed to predation as removal of the shrubs would remove any hiding cover. Increased predation by avian and other predators post-fire is expected, which will reduce the population of Sagebrush lizards in the fire area. Because little detail is known about the life history and habitat requirements of this species, protecting the lizard's habitat (based on the few known requirements) is important to managing for the population on the Monument. Preventing the invasion of cheat grass post-fire is also essential for maintaining the population of Sagebrush lizards within the fire area.

STRIPED WHIPSNAKE: Striped whipsnakes occur in the Columbia Basin of Central Washington up to 1,985 feet elevation. The Striped whipsnake is a long slender snake that is dark above with alternating light and dark stripes down the length of the body. Adults range in size from 90 to 180 cm total length. This species is rare throughout most of the Washington portion of its range. Striped whipsnakes have been documented in Washington only 26 times. In the last decade, only 3 observations have been reported. This species occurs in low elevation arid regions with scattered vegetation, and open rocky areas. Mating occurs in the spring with eggs being deposited in June, and

hatching in the late summer or early fall. This species has been documented to occur at the Hanford site. Little is known about the habitat requirements in Washington. The areas of Grant County where they occur have relatively undisturbed shrub-steppe habitat with a low cover of cheatgrass.

FIRE IMPACTS: The entire 21,233 acres of shrub-steppe habitat that burned during the Overlook fire can be considered Striped whipsnake habitat. This loss is combined with cumulative losses due to repeated fires on the Monument area (please see section on Cumulative Impacts page 9 and 10 this report). If present during the fire, Striped whipsnakes could have experienced mortality if unable to move quickly or find a burrow. Those that survived would experience temporary displacement. Eggs exposed to heat would have been rendered unviable. Suppression actions which included blading of soils to remove vegetation may have exposed nest sites to environmental conditions and predators and/or destroyed nest sites. Prey species are primarily lizards, but may include rodents, bats, frogs, birds, and other snakes. Habitat within the fire area for any of these species was greatly reduced. Therefore, prey species may be less available for the Striped whipsnake until the habitat recovers and is repopulated by the various prey species. Invasion of cheat grass into the fire area will reduce the likelihood that this area would recover into habitat that could support striped whipsnakes.

MULE DEER

Mule deer are a common resident ungulate of the Hanford Monument area. The area of highest density is along the Columbia River. The deer population in the Hanford Monument area is relatively stable. In the Wahluke Unit, deer can be hunted during regular state seasons using shot gun /muzzleloader /or archery. Mule deer are primarily browsers and rely on riparian vegetation and bitterbrush for browse. The deer tend to find shade for thermal cover in and around the riparian areas that were burned in this fire.

FIRE IMPACTS: The entire 21,233 acres within the Overlook fire footprint are considered Mule deer habitat, with 13,40 acres of riparian habitat very important for Mule deer. Mule deer are highly mobile animals, and it is anticipated that they were able to move out of the affected area during the fire. Recently born fawns, however, may not have been able to move out of the way of the fire, although no mortality of deer fawns was documented during post fire reconnaissance. The greatest impact to mule deer within the burn area is loss of available forage. Regrowth of grasses in upland areas is not anticipated until fall rains begin, possibly in November. Mule deer may forage off of the burn area on private lands, however, because deer are more solitary than herding ungulates (e.g. elk) agricultural depredation is not usually an issue with deer. Additionally, deer may also experience some nutritional stress due to loss of forage due to the fire. Lactating does may be at the greatest risk of this type of stress because of the energy demands that lactation produces. Deer will be much more vulnerable during the coming fall hunting season due to lack of suitable hiding cover on the Monument, and additional hunting pressure in areas where the deer have moved off

of the Monument onto private land areas.

IV. RECOMMENDATIONS

A. Fire Suppression:

Determinations of effect: The fire, suppression actions and proposed emergency stabilization had no directly attributable affect to the federally listed species, however, indirect impacts to several federal candidate species and state listed species due to loss of habitat were documented in this resource damage assessment. Because impacts are indirect, there is no need for emergency Section 7 Consultation for the Overlook Fire stabilization and emergency rehabilitation. Stabilization and rehabilitation treatments will mitigate damages due to fire and benefit listed species. Supporting documentation is included in the environmental compliance section of this report.

B. Emergency Stabilization:

Recommendations with Specifications:

- #3 - Non-native invasive species control- Integrated Pest Management. Use 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. This specification is critical to prevent the degradation of wildlife habitat and to promote the recovery of viable habitat for sensitive species.
- #4 - Non-native Invasive species control, Native seeding. This specification is critical, as mentioned above in wildlife species assessments, to stabilize the ecological integrity and condition of the burned area and to create a trajectory of recovery that will eventually result in viable habitat conditions for all 15 of the listed species addressed above.

C. Management recommendations (Non-Specification Related):

- Permanent photo points and monitoring plots should be established in key wildlife habitat locations to monitor habitat recovery. This should be coordinated with the vegetation monitoring as recommended in the Overlook Fire BAER Vegetation Report.

V. Consultations

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VI. References:

Flinders, J.T. and J.A. Chapman. 2003. Black-tailed Jackrabbit. Pages 126-146 in
Feldhamer, G.A., B.C. Thompson and J.A. Chapman, editors. *Wild mammals of North
America: biology, management, and conservation*. Johns Hopkins University Press,
Baltimore, Maryland, USA.

Hallock, L.A. and K.R. McAllister. 2005. *Sagebrush Lizard*. Washington Herp Atlas.
<http://www.dnr.wa.gov/nhp/refdesk/herp/>

Hallock, L.A. and McAllister, K.R. 2005. *Striped Whipsnake*. Washington Herp Atlas.
<http://www.dnr.wa.gov/nhp/refdesk/herp/>

Harniss, R. O. and R. B. Murray. 1973. *30 years of vegetal change following burning of
sagebrush-grass range*. *J. Range Manage.* 26:322-325.

Knight, R. L, and S. K. Knight. 1984. Responses of wintering bald eagles to boating
activity. *Journal of Wildlife Management* 48:999-1004.

Leu, M. and D. A. Manuwal. 1996. *Habitat requirements, status, and management of the
loggerhead shrike of the Yakima Training Center*. Final Report, College of Forest
Resources, University of Washington, Seattle, Washington, USA.

Martin, J. W., and B. A. Carlson. 1998. *Sage Sparrow (Amphispiza belli)*. In *The Birds of
North America*, No. 326 (A. Poole and F. Gill, eds.). The Birds of North America, Inc.,
Philadelphia, PA.

Meisel, J. 2006. Development and Application of a Resource Selection Model for Pygmy
Rabbits. Masters Thesis, Oregon State University, Corvallis, Oregon. 65 pgs.

Nordstrom, Noelle. 2004. Burrowing owl (*Athene cunicularia*). In E. M. Larsen, J. M. Azerrad, and N. Nordstrom, editors. Management Recommendations for Washington's Priority Species, Volume IV: Birds [Online]. Available <http://wdfw.wa.gov/hab/phs/vol4/buow.pdf>

Olendorff, R. R. 1993. *Biology and management of ferruginous hawk (Buteo regalis): a review*. Occasional Papers Number 1. Raptor Research and Technical Assistance Center, U.S. Bureau of Land Management, Boise, Idaho, USA.

Poole, L. 1992. *Reproductive success and Nesting Habitat of Loggerhead shrikes in Shrub-steppe communities*. Masters Thesis. Oregon State University, Corvallis, Oregon. 69 pgs.

Richardson, S., M. Whalen, D. Demers, and R. Milner. 2004. Ferruginous hawk (*Buteo regalis*). In M. Larsen, J. M. Azerrad, and N. Nordstrom, editors. Management Recommendations for Washington's Priority Species, Volume IV: Birds [Online]. Available <http://wdfw.wa.gov/hab/phs/vol4/feruge.htm>

Stalmaster, M. V. 1976. Winter ecology and effects of human activity on bald eagles in the Nooksack River Valley, Washington. Thesis, Western Washington State University, Bellingham, Washington, USA.

Steenhof, K. S., S. Berlinger, and L. H. Fredrickson. 1980. Habitat use by wintering bald eagles in South Dakota. *Journal of Wildlife Management* 44:798-805.

Storm, R. M and W. P Leonard, Eds. 1995. *Reptiles of Washington and Oregon*. Seattle Audubon Society, Seattle, Washington.

The Nature Conservancy of Washington. 1999. *Biodiversity Inventory and Analysis of the Hanford Site*, Final Report 1995-1999.

U.S. Fish and Wildlife Service. 2002. *Birds of conservation concern 2002*. Division of Migratory Bird Management, Arlington, Virginia. 99 pp.

Vander Haegen, Matthew. 2004. Loggerhead Shrike (*Lanius ludovicianus*). In E. M. Larsen, J. M. Azerrad, and N. Nordstrom, editors. Management Recommendations for Washington's Priority Species, Volume IV: Birds [Online]. Available <http://wdfw.wa.gov/hab/phs/vol4/losh.pdf>

Vander Haegen, Matthew. 2003. Sage Thrasher (*Oreoscoptes montanus*). In E. M. Larsen, J. M. Azerrad, and N. Nordstrom, editors. Management Recommendations for Washington's Priority Species, Volume IV: Birds [Online]. Available http://wdfw.wa.gov/hab/phs/vol4/sage_thrasher.pdf

Vander Haegen, Matthew. 2003. Sage Sparrow (*Amphispiza belli*). In E. M. Larsen, J. M. Azerrad, and N. Nordstrom, editors. Management Recommendations for Washington's Priority Species, Volume IV: Birds [Online]. Available http://wdfw.wa.gov/hab/phs/vol4/sage_thrasher.pdf

Washington Department of Fish and Wildlife. 1996. *Washington state recovery plan for the Ferruginous hawk*. Olympia, WA 63 pgs

Washington Department of Fish and Wildlife. 2001. Priority Habitat and Species Management Recommendations Volume IV: Birds. Bald Eagle *Haliaeetus leucocephalus*.

Watson, J.W. 2003. *Scientists seek reasons for declining Ferruginous hawk population*. Fish and Wildlife Science; an on-line science magazine, Washington Department of Fish and Wildlife.

Yensen, E. and P.W. Sherman. 2003. *Ground Squirrels*. In *Wild Mammals of North America: Biology, Management and Conservation*. Feldhamer, G.A., B. C. Thompson and J. A. Chapman, Eds., Second Edition. The Johns Hopkins University Press, Baltimore, Maryland, USA.

Yosef, R. 1996. *Loggerhead Shrike (Lanius ludovicianus)*. In *The Birds of North America*, No. 231 (A. Poole and F. Gill, eds.). The Academy of Natural Sciences, Philadelphia, and The American Ornithologists' Union, Washington, D.C.

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BURNED AREA EMERGENCY STABILIZATION PLAN
Overlook Fire
OPERATIONS ASSESSMENT

I. OBJECTIVES

- Identify, inventory, and map fire suppression impacts on jurisdictions affected by the fire.
- Specify rehabilitation measures to mitigate fire suppression impacts.
- Ensure specification recommendations are consistent with agency objectives.

- Protect natural and cultural resource values during rehabilitation efforts.

II. ISSUES

- Potential impacts to critical natural and cultural resources from suppression actions.
- Extensive soil disturbance on highly erodible soils from fire suppression activities.
- Damage to fences and gates within fire perimeter associated with fire suppression actions.

III. OBSERVATIONS

A. Background

Please refer to fire history summary, included in Executive Summary.

B. Reconnaissance Methodology

On July 15 and 16 Mid-Columbia River National Wildlife Refuge Complex (MCRNWRC) staff began evaluating resource impacts caused by the suppression effort on lands and physical improvements with the Overlook fire area. However, the fire was still burning in some areas at that time so additional evaluation was conducted on July 23, 2007. Team members did reconnaissance from the ground and obtained information from suppression forces. Information was also gathered from interviews with Division Supervisors, and from engine crews assigned to the fire.

C. Findings

The Overlook fire burned approximately 21,083 acres on the Hanford Reach National Monument. Approximately 20.7 miles (40 acres based on 16 foot width) of dozer line and diskline was created to stop the fire. Some hand line was also used on steeper slopes along the fire southern boundary. Approximately 2.5

miles of 4-strand barbed wire fence, signs and one gate was impacted by suppression crews and backfiring operations along the HRNM boundary to prevent fire spread across state Highway 24 (see Photo documentation). Damage, directly attributed to backfiring also occurred to fences along the east boundary of the Monument. These fences are critical to prevent livestock (cattle, horses, and sheep) from trespassing onto Monument lands. Further, public access points on this unit of the Monument were impacted by fire suppression including access roads, gates and parking areas.

Rehabilitation of suppression line is necessary to protect habitats from noxious weed infestation, ORV intrusion on the landscape, and to minimize fragmentation of ecological areas. Monitoring of suppression lines is necessary to determine the need for future noxious weed mitigation needs. Dozer lines and disklines within the burned area on lands managed by FWS will be treated according to methods described in the Hanford Site Biological Resource Management Plan (HSBRMP, 1996). A cultural resource assessment has been initiated on all suppression lines within the fire (refer to Cultural Resources Assessment). Further field visits and assessments of cultural resource impacts due to suppression will be subsequent to this plan.

There are five types of suppression impacts to be considered:

- Dozer and diskline built on FWS which require restoration and revegetation. This will require adequate soil moisture to establish a firm seedbed prior to reseeding actions.
- Dozer and diskline built on FWS which require restoration and NO revegetation that will be maintained for fire break areas.
- Repair of the boundary fence, interior fence, a gate and public access points on the HRNM.
- Access roads to the fire area that were used for suppression actions are now impassible due do the amount of lose powdery soils resulting from the destruction of soil structure in the upper horizons. These roads will be rehabilitated as weather permits (accumulation of adequate moisture).
- Previous ecological rehabilitation plantings were impacted by the suppression actions and will need to be replaced.

IV. RECOMMENDATIONS

A. Fire Suppression- (non-specification related-charged to suppression account)

- **Dozer, diskline and Road Rehabilitation.** Rehabilitate dozerlines, disklines and other sites directly or indirectly impacted by fire suppression activities. Dozerline and diskline rehab should be done at a later date due to the degraded soil conditions at this time. This activity should take place in the late fall or early winter when soil moisture content is higher. Some areas will be rehabilitated and re-vegetated, and some areas will be rehabilitated and maintained as fire break.
- **Fence Repair.** Repair suppression damaged fence and signs around perimeter of the fire between HRNM boundary and other private lands. These fences were 4-strand barbed wire and will need to be replaced with new, similar materials. Fence along Highway 24 will be replaced with single strand wire to reduce the build up of tumbleweed along the fence and to reduce future fire hazards.
- **Replace Plantings.** Replace areas that had received ecological rehabilitation treatments prior to the Overlook fire. Approximately ½ acre of sagebrush plantings, and 1 acre of bitterbrush plantings were lost due to suppression, these areas will need to be replanted. Approximately 250 Wyoming big sagebrush (*Artemisia tridentata wyomingensis*) plants and 500 Antelope bitterbrush (*Purshia tridentata*) plants were lost due to suppression actions.

B. Management (non-specification related)

- Continue to review rehabilitation specifications with operators and other personnel associated with implementation of the BAER Plan to insure suppression rehabilitation specifications are clearly understood for protection of sensitive resources and land productivity. Ensure proper accounting procedures are followed in the repair of suppression related impacts through suppression accounts.
- Guarantee safety of personnel assigned to rehab operational assignments in the fire area.
- Monitor suppression related damage on dirt roads following fall and winter moisture events to see if additional rehab measures are necessary.

V. CONSULTATIONS

Greg Hughes, Project Leader FWS
 Heidi Newsome, Wildlife Biologist, FWS
 Alex Bourdeau, Archeologist, FWS

Mike Ritter, Deputy Project Leader, FWS
Kurt Thompson, Assistant Fire Management Officer, FWS
Lindsey Hayes, GIS Specialist, FWS
Jerry Keelin, Hanford Fire

VI. REFERENCES

USDI, 1995. BAER Field Team Leader Reference Book
DOE, 1996. Hanford Site Biological Resource Management Plan

Chris Schulte, Fire Management Officer –USFWS, (509) 371-1801 ext. 303

APPENDIX II - ENVIRONMENTAL COMPLIANCE

- **Environmental Compliance Considerations and Documentation**
- **NEPA Environmental Screening Checklist and Categorical Exclusion**



ENVIRONMENTAL COMPLIANCE CONSIDERATIONS, DOCUMENTATION, AND CONSULTATIONS

Overlook Fire Burned Area Emergency Stabilization Plan

FEDERAL, STATE, AND PRIVATE LANDS ENVIRONMENTAL COMPLIANCE RESPONSIBILITIES

All projects proposed in the Overlook Fire Burned Area Emergency Stabilization (ES) Plan that are prescribed, funded, or implemented by federal agencies on federal, state, or private lands are subject to compliance with the National Environmental Policy Act (NEPA) in accordance with the guidelines provided by Council on Environmental Quality (CEQ) Regulations (40 CFR 1500-1508); Department of the Interior (DOI) Manual, Part 516, U.S. Fish and Wildlife Service (FWS) NEPA Guidelines, Part 516 DM 6, Appendix 1; and Department of Energy (DOE) NEPA Regulations (10 CFR Part 1021). This Appendix documents the BAER Team considerations of NEPA compliance requirements for prescribed rehabilitation and monitoring actions described in this plan for all jurisdictions affected by the Overlook Fire burned area emergency stabilization.

B. RELATED PLANS AND CUMULATIVE IMPACTS ANALYSIS

Draft Hanford Reach National Monument Biological Resources Management Plan (DBRMP, FWS 1996), Final Hanford Comprehensive Land-Use Plan and Environmental Impact Statement (CLUP, DOE 1999), and Draft Hanford Reach National Monument Comprehensive Conservation Plan and Environmental Impact Statement (DCCP, FWS 2006): The BAER Team Environmental Protection Specialist reviewed the DBRMP, CLUP and DCCP and determined that actions proposed in the McLane Fire BAER Plan within the boundary of the Hanford Reach National Monument are consistent with the management objectives established in those land use plans. The CLUP EIS incorporates the DBRMP by reference, and both specifically address bulldozer lines and provides NEPA compliance for bulldozer line rehabilitation.

Cumulative Impact Analysis: Cumulative effects are the environmental impacts resulting from the incremental impacts of a proposed action when added to other past, present, and reasonably foreseeable future actions, both federal and non-federal. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time. The emergency protection and stabilization treatments for areas affected by the Overlook Fire, as proposed in the Overlook Fire ES Plan, do not result in an intensity of impact (i.e., major ground disturbance, etc.) that would cumulatively constitute a significant impact on the quality of the environment. No other actions are proposed or are

reasonably foreseeable that would contribute to or enhance impacts related to rehabilitation under this BAER plan. The treatments are consistent with the above jurisdictional management plans and associated environmental compliance documents and categorical exclusions listed below.

C. APPLICABLE AND RELEVANT CATEGORICAL EXCLUSIONS

U.S. Fish and Wildlife Service: The individual actions proposed in this plan for the Hanford Reach National Monument are categorically excluded from further environmental analysis as provided for in the DOI Manual Part 516 and FWS NEPA Guidelines, Part 516 DM 6, Appendix 1. All applicable and relevant Department and Agency categorical exclusions are listed below. Department exceptions—(516) DM 2.3—do not apply to any of the individual actions proposed. Categorical exclusion decisions are being made with consideration given to the results of required emergency consultations completed by the BAER Team and documented in Section E below.

Applicable Department of the Interior Categorical Exclusions

- 516 DM2 App. 2, 1.6 Non-destructive data collection, inventory (including field, aerial, and satellite surveying and mapping), study, research and monitoring activities.
- 516 DM 6 App. 4.4 A Operations, maintenance, and replacement of existing facilities (includes road maintenance).
- 516 DM 6 App. 4.4 L(5) Emergency road repairs under 23 U.S.C. 125.
- 516 DM 6 App. 7.4 C(3) Routine maintenance and repairs to non-historic structures, facilities, utilities, grounds and trails.
- 516 DM 6 App. 7.4 C(19) Landscaping and landscape maintenance in previously disturbed or developed areas.

Applicable U.S. Fish and Wildlife Service Categorical Exclusions

- 516 DM 6 App. 1.4B (1) Research, inventory, and information collection activities directly related to the conservation of fish and wildlife resources which involve negligible animal mortality of habitat destruction, no introduction of contaminants, or no introduction of organisms not indigenous to the affected ecosystem.
- 516 DM 6 App. 1.4B (3) i The installation of fences.
- 516 DM 6 App. 1.4B (3)iii The planting of seeds or seedlings and other minor revegetation actions.
- 516 DM 6 App. 1.4B (3)v The development of limited access for routine maintenance and management purposes.

516 DM 6 App. 1.4B (5) Fire management activities, including prevention and restoration measures, when conducted in accordance with Departmental and Service procedures.

516 DM 6 App. 1.4B (6). The reintroduction or supplementation (e.g. stocking) of native, formerly native, or established species into suitable habitat within their historic or established range, where no or negligible environmental disturbances are anticipated.

D. STATEMENT OF COMPLIANCE FOR THE OVERLOOK FIRE BURNED AREA EMERGENCY STABILIZATION PLAN

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

- 1) **National Historic Preservation Act (NHPA).** The BAER Team archeologists have initiated the necessary consultation with the Washington State Historic Preservation Office (SHPO) and the Yakama, Umatilla, Nez Perce, and Wanapum Tribes regarding treatments proposed in the Overlook Fire BAER Plan.
- 2) **Executive Order 11988 - Floodplain Management.** No treatments are proposed within the 100-year floodplain.
- 3) **Executive Order 11990 - Protection of Wetlands.** Treatments and actions proposed within wetland areas will “minimize the destruction, loss or degradation of wetlands, and preserve and enhance the natural and beneficial values of wetlands.”
- 4) **Executive Order 12372 - Intergovernmental Review.** Coordination and consultation is ongoing with affected tribes, federal, state and local agencies. A copy of the BAER Plan will be disseminated to all affected agencies.
- 5) **Executive Order 12892 - Federal Actions to Address Environmental Justice in Minority and Low-Income Populations.** All federal actions must address and identify, as appropriate, disproportionately high and adverse human health or low-income populations, and Indian tribes in the United States. The BAER Team Environmental Protection Specialist has determined that the actions proposed in this plan will result in no adverse

human health or environmental effects for minority or low-income populations and/or Native American tribal members.

- 6) **Endangered Species Act.** The BAER Team Wildlife Biologist and Vegetation Specialists have consulted with the FWS and Washington Department of Fish and Wildlife regarding actions proposed in this plan and its potential effects on federal and state listed species. Individual agencies are responsible for continued consultations during plan implementation.
- 7) **Secretarial Order 3127.** Although contaminated sites are known to occur on properties owned by the DOE at the Hanford Site, no treatments are proposed that would affect contaminated sites. There are no known contaminated sites on other jurisdictions affected by the Overlook Fire.
- 8) **Clean Water Act.** The BAER Team Environmental Protection Specialist has determined that treatments prescribed in the area burned by the Overlook Fire will have no impacts to water quality within wetland areas or other water bodies. The wetland areas within the fire perimeter consist of irrigation return flows; therefore the wetland is artificial in nature. The water flowing through the wetland does eventually return to the Columbia River; however, treatments proposed within the wetlands would have no impact to water returning to the river. Impacts would not differ significantly from routine water use practices for the area. In the long-term, treatments proposed in this plan would actually be expected to have a beneficial impact to water quality through stabilization of ash and soils and treatment of invasive species within the area burned by the Overlook Fire.
- 9) **Clean Air Act.** Federal Ambient Air Quality Primary and Secondary Standards are established by the U.S. Environmental Protection Agency (EPA, National Ambient Air Quality Standards) (Clean Air Act, 42 U.S.C. 7470, et seq., as amended). The BAER Team Environmental Protection Specialist has determined that treatments prescribed in the area burned by the Overlook Fire will have short-term minor impacts to air quality that would not differ significantly from routine land use practices for the area. In the long-term, treatments proposed in this plan would be expected to have a beneficial impact to air quality through stabilization of ash and soils within the area burned by the Overlook Fire.

E. CONSULTATIONS

NEPA Checklist: If any of the following exception applies, the ESR Plan cannot be Categorically Excluded and an Environmental Assessment (EA) is required.

(Yes) (No)

- (X) Adversely affect public health and/or safety.
- (X) Adversely affect historic or cultural resources, wilderness, wild and scenic rivers aquifers, prime farmlands, wetlands, floodplains, ecologically critical areas, or national natural landmarks.
- (X) Have highly controversial environmental effects.
- (X) Have highly uncertain environmental effects or involve unique or unknown environmental risks.
- (X) Establish a precedent resulting in significant environmental effects.
- (X) Relates to other actions with individually insignificant but cumulatively significant environmental effects.
- (X) Adversely effects properties listed or eligible for listing in the National Register of Historic Places
- (X) Adversely affect a species listed, or proposed to be listed, as "threatened" or "endangered."
- (X) Threaten to violate any laws or requirements imposed for the "protection of the environment," such as Executive Order 11988 (Floodplain Management) or Executive Order 11990 (Protection of Wetlands).

National Historic Preservation Act

Ground Disturbance:

- None
- Ground disturbance did occur and an archeologist survey, required under section 110 of the NHPA has been prepared. Findings have been documented in Appendix I- Cultural Resources Assessment.

A NHPA Clearance Form:

- Is required because the project may have affected a site that is eligible or on the National Register of Historic Places. The clearance form will be attached. The SHPO has been consulted under Section 106 (see Cultural Resource Assessment, Appendix I).
- Is not required because the ESR Plan has no potential to affect cultural resources (initial of Cultural Resource Specialist).

Other Requirements

(Yes) (No)

- () Does the ESR Plan have potential to affect any Native American uses? If so, consultation with affiliated tribes is needed.
- () Are any toxic chemicals, including pesticides or treated wood, proposed for use? If so, local agency integrated pest management specialists must be consulted.

I have reviewed the proposals in the Overlook Fire Burned Area Emergency Stabilization Plan in accordance with the criteria above and have determined that the proposed actions would not involve any significant environmental effects. Therefore, this plan is categorically excluded from further environmental (NEPA) review and documentation. ESR Team technical specialists have completed necessary coordination and consultation to insure compliance with the National Historic Preservation Act, Endangered Species Act, Clean Water Act, Clean Air Act, and other federal, state and local environment review requirements.

ES Team Environmental Protection Specialist Date

Gregory M. Hughes, Project Leader Date
Mid-Columbia River National Wildlife Refuge Complex,
Hanford Reach National Monument

APPENDIX III – MAPS 20 Pages of Maps (all are .pdf format and not included in Word document)

All maps are created in GIS using GPS location information and GIS layers. These Maps are .pdf documents, and will be printed and attached in the following order, or included electronically as a separate file containing all Maps, rather than converting all files to Word compatible format.

1. Overlook Fire Burned area Perimeter Map
2. Overlook Fire Suppression Impacts Map
3. Overlook Fire Perimeter Map with McLane Fire Perimeter and White Bluffs Fire Perimeter Map
4. Vegetation Mortality Map
5. Wind Erosion Risk Map
6. Upland and Riparian acres affected Map
7. Soils Map
8. Sensitive Plant Communities Map
9. Cheat grass / invasive species risk Map
10. Wyoming Big Sagebrush Dominant Pre-fire vegetation Map
11. Antelope Bitterbrush Dominant Pre-fire Vegetation Map
12. Spiny Hopsage Dominant Pre-fire Vegetation Map
13. Rare Plants Map
14. Invasive Species and Noxious Weeds Map
15. Biological Control Sites / Insectaries
16. Wildlife Species of Concern locations Map
17. Avian Habitat Map
18. Pygmy Rabbit Habitat Map
19. Sagebrush Lizard Habitat Map
20. Proposed treatment Map – Aerial Spraying
21. Proposed treatment Map – Seeding treatments

APPENDIX IV - PHOTO DOCUMENTATION

BURNED AREA EMERGENCY STABILIZATION PLAN OVERLOOK FIRE- HANFORD REACH NATIONAL MONUMENT

- Soil and Erosion Issues
- Vegetation Resources Issues
- Public Safety and Access Issues
- Wildlife Resource Issues
- Suppression impacts



APPENDIX V - SUPPORT DOCUMENTS

- Cost/Risk Analysis
- Native-Non-native worksheet
- Section 7 Species List
- Washington State Species List



Cost/Risk Analysis

Part 1. Treatment Cost

Treatments	Cost
Non-native invasive species control- Integrated Pest Management	456,450.00
Ecological Stabilization- Native Seeding	5,677,834.00
Law enforcement monitoring of cultural resources exposed by fire	37,722.00
Determine whether known historic properties may be at risk of further degradation	11,550.30
Total Cost	6,183,556.30

Part 2. Probability of Rehabilitation Treatments Successfully Meeting EFR Objectives

Treatments	Units	%
Non-native invasive species control- Integrated Pest Management	13,575 acres	75
Ecological Stabilization- Native Seeding	17,020 acres	75
Law enforcement monitoring of cultural resources exposed by fire	600 hours	100
Determine whether known historic properties may be at risk of further degradation	20 Sites	100

Risk of Resource Value Loss or Damage

Identify the risk (high, medium, low, none or not applicable (NA)) of unacceptable impacts or loss of resources.

No Action- Treatments Not Implemented (check one)

Resource Value	None	Low	Mid	High
Lives		X		
Residential & Commercial Property		X		
Wildlife populations and Listed Species				X
Sensitive Plant Communities and rare plants				X
Ecological Stability				X
Site Productivity				X
Weed Invasion				X
Cultural Resources			X	

Proposed Action - Treatments Successfully Implemented (check one)

Resource Value	None	Low	Mid	High
Lives	X			

Residential & Commercial Property		X		
Wildlife populations and Listed Species			X	
Sensitive Plant Communities and rare plants			X	
Ecological Stability		X		
Site Productivity		X		
Weed Invasion		X		
Cultural Resources		X		

Part 3. SUMMARY

The costs of the project and probability of success of the proposed treatments are compared with the risks to resource values if: 1) no action is taken, and 2) the proposed action is successfully implemented. Alternatives may be included in this analysis to assist in the selection of the treatments that will cost effectively achieve the EFR objectives. Answer the following questions to determine which proposed EFR treatments should be selected and implemented.

1. Are the risks to natural resources and private property **acceptable** as a result of the fire if the following actions are taken?

Proposed Action Yes | | No | | Rationale for answer:

Non-native invasive species control- Integrated Pest Management and Re-vegetation Invasive species control. The detection, control and monitoring of non-native invasive species in burned areas and the prevention of the expansion of known populations into newly disturbed areas will present no risk to cultural resources and will prevent the spread of nonnative invasive species to private property.

Ecological Stabilization- Native Seeding. Stabilization of erosion prone soil will prevent traffic hazard along Highway 240 and county roads. Stabilization of soils will prevent erosion, dust storms, from delivering soils to private lands areas and will prevent health hazards (breathing difficulties or allergy symptoms) for local residents. This process will also help maintain site productivity and buffer sensitive plant communities to invasion of non-native species.

Protective Fencing Replacement and Public Safety, Warning Signs. The repair of existing fence to direct the public use and access and to exclude livestock from burned area is necessary until native vegetation can be reestablished, and for protection of Monument resources. Grazing was prohibited on the Monument through Presidential proclamation. Fence and signs will direct the public and reduce trespass into sensitive areas. Further, this will benefit cultural resources as fence will reduce trespass and reduce looting.

Effectiveness Monitoring. Documentation of the success of treatments is important in order to justify the costs associated with large projects that require public funds. It would be irresponsible to expend public funds without documenting the effectiveness and value of the stabilization treatments.

No Action Yes No Rationale for answer:

No the risks to cultural resources and private property are not acceptable. Non-native invasive plants and unacceptable soil erosion could significantly impact the Monument's resources and will likely affect private property. Ecological function will be reduced and sensitive plant communities and wildlife will be impacted. Cultural resources will incur additional damage if fences are not repaired. The public trust will be violated because the long-term management of this area was entrusted to the Department of Interior. Permanent site degradation will reduce the areas ability to support priority public uses.

Alternative(s) Yes No Rationale for answer: NONE

2. Is the probability of success of the proposed action, alternatives or no action acceptable given their costs?

Proposed Action Yes No Rationale for answer:

The actions have been rated as having a high probability of success. Previous efforts to conduct similar post-fire stabilization on the Hanford Reach National Monument have been highly successful. The proposed treatments will not only protect public safety and private property by controlling erosion and weed spread, but will also protect site productivity, ecological function and cultural resources. Protection of sensitive shrub-steppe habitat and obligate wildlife species will not only benefit these resources but will improve their condition as re-growth occurs.

No Action Yes No Rationale for answer:

Failure to protect and stabilize this area would impact nationally significant resources and create a public safety hazard. Failure to stabilize highly mobile and erosion prone soils will cause wind borne dust storms to reduce visibility along major traffic routes and increase the health hazard due to breathing difficulties or allergies of local residents. Failure to prevent the spread of non-native plants will increase the long term costs of managing these lands, increase fire risks, reduce critical habitat for many wildlife species, and reduce potential management of listed species and reintroduction sites for listed species.

Alternative(s) Yes No Rationale for answer: None.

3. Which approach will most cost-effectively and successfully attain the EFR objectives and therefore is recommended for implementation from a Cost/Risk Analysis standpoint?

Proposed Action , Alternative(s) , or No Action

It is highly likely that the no action alternative would result in substantial damage to nationally significant cultural and biological resources of The Hanford Reach National Monument. The proposed actions have a high probability of protecting soil, vegetation, and wildlife resources currently at risk of degradation. The proposed action would achieve the emergency stabilization objectives established in DOI policy and therefore are recommended for implementation.

Comments: The Overlook fire was preceded by several other large wildfires within the Monument and in the surrounding area that have caused increasing impacts to natural resources, cultural resources, and ongoing management and public use operations. Losses of critical shrub-steppe habitat between 2000 and 2006 total 177,509 acres locally, with 90,613 acres lost within the Monument (not including the current acres burned within the Overlook fire). The increasing frequency and intensity of range fires throughout the Columbia and Great basins pose a critical threat to native grasses and shrubs and overall wildlife habitat in the shrub-steppe. Throughout shrub-steppe habitat in Washington, fire has continued to eliminate shrub-dominated sites at a rate faster than natural regeneration (or revegetation efforts) can restore. The regional negative impact of shrinking high quality habitat cannot be overstated.

Exhibit 6-1 NATIVE/NON-NATIVE PLANT WORKSHEET

This worksheet is required for all ESR Plans. These criteria will be evaluated by the interdisciplinary team preparing the ESR Plan. Each element requires a short narrative/rationale.

Proposed Native Plants in Seed Mixture

1. Are the native plants proposed for seeding adapted to the ecological sites in the burned area?

Yes No Rationale: Native seed is required to stabilize soils, protect site integrity, benefit wildlife species and protect human life and property on adjacent private lands. The native seed required for this project must come from Columbia Basin ecotypes to meet native seed policies of the U.S. Fish and Wildlife service and program objectives for the Hanford Reach National Monument. The Hanford Reach National Monument/Saddle Mountain National Wildlife Refuge lies in the Columbia Basin Ecoregion of Eastern Washington State. This ecoregion is in the "rain shadow" of the Cascade Mountains and is the hottest and driest part of the State. Rainfall values for the area average 6" annually. Temperatures often exceed 90° F during the summer, while winter temperatures hover near freezing. Windy, drying conditions are normal for the region. Soils are alluvial deposits from ice age lakes, and river channels. Soils tend to be sandy, with little organic material, and do not generally retain significant moisture. Due to these conditions, plant materials adapted to the site conditions are essential for restoration purposes. Plant materials derived from the local ecoregion will have a competitive advantage during establishment and have a higher probability of survival once established, than material that is not from the local ecoregion.

2. Is seed or seedlings of native plants available in sufficient quantity for the proposed project?

Yes No Rationale: The Overlook fire has created unusual and compelling circumstances whereby native seed that meets Service standards must be obtained immediately in order to meet project requirements for soil stabilization; current fires within the United States on other Interior lands has increased demand for this native seed and are daily depleting supplies of native seed that meet our project specifications; there is not a vast quantity of native seed grown annually that meet HRNM specifications therefore acquiring the seed immediately is essential; it is necessary to acquire seed that has the best chance of germinating to achieve stabilization goals and protect life and property. Currently sufficient quantities of seed exist on the market to meet the needs of this project.

3. Is the cost and/or quality of the native seed reasonable given the project size and approved field unit management and ESR Plan objectives?

Yes No Rationale: Plant materials that are Columbia Basin derived are slightly more expensive, however, given that the environmental conditions on the site are extremely harsh, seed from the local ecoregion will have a competitive advantage during establishment and have a higher probability of survival once established, than material that is not from the local ecoregion. This therefore increases the cost effectiveness of spending slightly more initially on seed and plant materials.

4. Will the native plants establish and survive given the environmental conditions and the current or future competition from other species in the seed mix or from exotic plants?

Yes No Rationale: Plant materials derived from the local ecoregion will have a competitive advantage during establishment and have a higher probability of survival once established, than material that is not from the local ecoregion.

5. Will the current or proposed land management (e.g., wildlife populations, recreation use, livestock, etc.) after the seeding establishment period maintain the seeded native plants in the seed mixture?

Yes No Rationale: Rehabilitation areas within the Overlook fire area are within an open public access area, however, current regulations for ORV use, horseback riding, mountain bike use and other forms of recreation are sufficient to protect the regenerating area. No grazing or livestock are present on the Hanford Reach National Monument. Wildlife in the area has been impacted by repeated fires in the area and current wildlife population levels do not indicate that impacts to regenerating plants from wildlife would be significant.

Use of native species for rehabilitation projects is required if all the answers to this portion of the worksheet are yes (assuming that the native plant species are available).

Proposed Non-native Plants in Seed Mixture

1. Is the use of non-native plants necessary to meet objectives, e.g., consistent with applicable approved field unit management plans ?

Yes No Rationale: Not applicable, there are no non-native plants or species proposed in our treatments.

2. Will non-native plants meet the objective(s) for which they are planted without unacceptably diminishing diversity and disrupting ecological processes (nutrient cycling, water infiltration, energy flow, etc.) in the plant community?

Yes No Rationale: Not applicable, there are no non-native plants or species proposed in our treatments.

3. Will non-native plants stay on the site they are seeded and not significantly displace or interbreed with native plants?

Yes No Rationale: Not applicable, there are no non-native plants or species proposed in our treatments.

A "no" response requires additional analysis in the environmental assessment or selection of an alternate species in the seed mixture.

PROPOSED SEED MIXTURE

Non-native Plants	Native Plants
	Indian Ricegrass (<i>Oryzopsis hymenoides</i>) (Nez Par)
	Sandberg's bluegrass (<i>Poa sandbergii</i> = <i>Poa secunda</i>) (Hanford)
	Thickspike Wheatgrass (<i>Elymus lanceolatus</i>) (Swindemar)
	Bottlebrush Squirreltail (<i>Elymus elymoides</i>)
	Sand dropseed (<i>Sporobolous cryptandrus</i>)
	Bluebunch Wheatgrass (<i>Pseudoroegneria spicata</i>)
	Prairie Juengrass (<i>Koeleria cristata</i>)
	Yarrow, (<i>Achillea millefolium</i>)

	Columbia Blue Flax (<i>Linum</i> sp.)
	Wyoming Big sagebrush (<i>Artemisia tridentata</i> var. <i>wyomingensis</i>)
	Great Basin Wild Ryegrass (<i>Elymus cinereus</i>)
	Winterfat (<i>Krascheninnikovia lanata</i>)
	Antelope bitterbrush (<i>Purshia tridentata</i>)

GRANT COUNTY
Updated 5/31/2007

LISTED

Endangered

Pygmy rabbit (*Brachylagus idahoensis*) – Columbia Basin distinct population segment

Threatened

Bald eagle (*Haliaeetus leucocephalus*)

Bull trout (*Salvelinus confluentus*) – Columbia River distinct population segment

Spiranthes diluvialis (Ute ladies' -tresses), plant

CANDIDATE

Greater sage grouse (*Centrocercus urophasianus*) – Columbia Basin distinct population segment

Washington ground squirrel (*Spermophilus washingtoni*)

Artemisia campestris ssp. *borealis* var. *wormskioldii* (Northern wormwood), plant

SPECIES OF CONCERN

Animals

Burrowing owl (*Athene cunicularia*)

California floater (*Anodonta californiensis*), mussel

Columbian sharp-tailed grouse (*Tympanuchus phasianellus columbianus*)

Ferruginous hawk (*Buteo regalis*)

Giant Columbia spire snail (*Fluminicola columbiana*)

Kincaid meadow vole (*Microtus pennsylvanicus kincaidi*)

Loggerhead shrike (*Lanius ludovicianus*)

Long-eared myotis (*Myotis evotis*)

Northern goshawk (*Accipiter gentilis*)

Northern leopard frog (*Rana pipiens*)

Pacific lamprey (*Lampetra tridentata*)

Pallid Townsend's big-eared bat (*Corynorhinus townsendii pallescens*)

Redband trout (*Oncorhynchus mykiss*)

River lamprey (*Lampetra ayresi*)

Sagebrush lizard (*Sceloporus graciosus*)

Western brook lamprey (*Lampetra richardsoni*)

Vascular Plants

Cryptantha leucophaea (Gray cryptantha)

Lomatium tuberosum (Hoover's desert-parsley)

Oxytropis campestris var. *wanapum* (Wanapum crazyweed)

FRANKLIN COUNTY
Updated 5/31/2007

LISTED

Endangered

Pygmy rabbit (*Brachylagus idahoensis*) – Columbia Basin distinct population segment

Threatened

Bald eagle (*Haliaeetus leucocephalus*)

Bull trout (*Salvelinus confluentus*) – Columbia River distinct population segment

Spiranthes diluvialis (Ute ladies' -tresses), plant

CANDIDATE

Washington ground squirrel (*Spermophilus washingtoni*)

Lesquerella tuplashensis (White Bluffs bladderpod), plant

SPECIES OF CONCERN

Animals

Burrowing owl (*Athene cunicularia*)

California floater (*Anodonta californiensis*), mussel

Columbia clubtail (*Gomphus lynnae*), dragonfly

Ferruginous hawk (*Buteo regalis*)

Giant Columbia spire snail (*Fluminicola columbiana*)

Loggerhead shrike (*Lanius ludovicianus*)

Long-eared myotis (*Myotis evotis*)

Pacific lamprey (*Lampetra tridentata*)

Pallid Townsend's big-eared bat (*Corynorhinus townsendii pallescens*)

Redband trout (*Oncorhynchus mykiss*)

River lamprey (*Lampetra ayresi*)

Sagebrush lizard (*Sceloporus graciosus*)

Western brook lamprey (*Lampetra richardsoni*)

Vascular Plants

Cryptantha leucophaea (Gray cryptantha)



Species of Concern

State Species of Concern

Include those species listed as State Endangered, State Threatened, State Sensitive, or State Candidate, as well as species listed or proposed for listing by the U.S. Fish and Wildlife Service or the National Marine Fisheries Service.

Search Species Lists

SORT RESULTS BY:

- Common Name
- Scientific Name
- Animal Type

[Search Listings](#)
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Species of Concern Lists

- [Endangered Species](#)
 - [Threatened Species](#)
 - [Sensitive Species](#)
 - [State Candidate Species](#)
-
- [Complete SOC List](#)
 - [Main SOC Page](#)

Status Codes:

FE: Federal Endangered
FT: Federal Threatened
FC: Federal Candidate
FCo: Federal Species of Concern
SE: State Endangered
ST: State Threatened
SC: State Candidate
SS: State Sensitive

Mapping Criteria Codes:

(listed in order of decreasing specificity)
 B: Breeding Location (Nest or Den)
 CR: Communal Roost
 RC,RLC,RSC: Regular (Large or Small) Concentration
 RI: Regular Individual
 IO: Individual Occurrence
(If a less specific criterion is listed, then the more specific criteria are implied as well)

Related Links

- [State Monitor Species](#)

Species of Concern in Washington State

Current through June 13, 2007

COMMON NAME	SCIENTIFIC NAME	ANIMAL TYPE	FEDERAL STATUS	STATE STATUS	MAPPING CRITERIA
WESTERN TOAD	<i>BUFO BOREAS</i>	Amphibian	FCo	SC	IO
NORTHERN LEOPARD FROG	<i>RANA PIPIENS</i>	Amphibian	FCo	SE	IO
OREGON SPOTTED FROG	<i>RANA PRETIOSA</i>	Amphibian	FC	SE	IO
COLUMBIA SPOTTED FROG	<i>RANA LUTEIVENTRIS</i>	Amphibian	none	SC	IO
CASCADE TORRENT SALAMANDER	<i>RHYACOTRITON CASCADAE</i>	Amphibian	none	SC	IO
DUNN'S SALAMANDER	<i>PLETHODON DUNNI</i>	Amphibian	none	SC	IO
LARCH MOUNTAIN SALAMANDER	<i>PLETHODON LARSELLI</i>	Amphibian	FCo	SS	IO
VAN DYKE'S SALAMANDER	<i>PLETHODON VANDYKEI</i>	Amphibian	FCo	SC	IO
ROCKY MOUNTAIN TAILED FROG	<i>ASCAPHUS MONTANUS</i>	Amphibian	none	SC	IO
COMMON LOON	<i>GAVIA IMMER</i>	Bird	none	SS	B
WESTERN GREBE	<i>AECHMOPHORUS OCCIDENTALIS</i>	Bird	none	SC	B
SHORT-TAILED ALBATROSS	<i>PHOEBASTRIA ALBATRUS</i>	Bird	FE	SC	IO
AMERICAN WHITE PELICAN	<i>PELECANUS ERYTHORHYNCHOS</i>	Bird	none	SE	B,RSC
BROWN PELICAN	<i>PELECANUS OCCIDENTALIS</i>	Bird	FE	SE	RSC
BRANDT'S CORMORANT	<i>PHALACROCORAX PENICILLATUS</i>	Bird	none	SC	B
GOLDEN EAGLE	<i>AQUILA CHRYSAETOS</i>	Bird	none	SC	B
BALD EAGLE	<i>HALIAEETUS LEUCOCEPHALUS</i>	Bird	FT	ST	B,RSC,CR
NORTHERN GOSHAWK	<i>ACCIPITER GENTILIS</i>	Bird	FCo	SC	B
FERRUGINOUS HAWK	<i>BUTEO REGALIS</i>	Bird	FCo	ST	B
MERLIN	<i>FALCO COLUMBARIUS</i>	Bird	none	SC	B
PEREGRINE FALCON	<i>FALCO PEREGRINUS</i>	Bird	FCo	SS	B,RI
AMERICAN PEREGRINE FALCON	<i>FALCO PEREGRINUS ANATUM</i>	Bird	FCo	SS	B,RI
ARCTIC PEREGRINE FALCON	<i>FALCO PEREGRINUS TUNDRIUS</i>	Bird	FCo	SS	RI
PEALE'S PEREGRINE FALCON	<i>FALCO PEREGRINUS PEALEI</i>	Bird	FCo	SS	B,RI
SHARP-TAILED GROUSE	<i>TYMPANUCHUS PHASIANELLUS</i>	Bird	FCo	ST	B,RSC
SAGE GROUSE	<i>CENTROCERCUS UROPHASIANUS</i>	Bird	FC	ST	B,RSC
SANDHILL CRANE	<i>GRUS CANADENSIS</i>	Bird	none	SE	B,RLC
SNOWY PLOVER	<i>CHARADRIUS ALEXANDRINUS</i>	Bird	FT	SE	B
UPLAND SANDPIPER	<i>BARTRAMIA LONGICAUDA</i>	Bird	none	SE	B,RI
COMMON MURRE	<i>URIA AALGE</i>	Bird	none	SC	B,RC
MARbled MURRELET	<i>BRACHYRAMPHUS MARMORATUS</i>	Bird	FT	ST	B
CASSIN'S AUKLET	<i>PTYCHORAMPHUS ALEUTICUS</i>	Bird	FCo	SC	B
TUFTED PUFFIN	<i>FRATERCULA CIRRHATA</i>	Bird	FCo	SC	RLC
YELLOW-BILLED CUCKOO	<i>COCCYZUS AMERICANUS</i>	Bird	FC	SC	B,RI
BURROWING OWL	<i>ATHENE CUNICULARIA</i>	Bird	FCo	SC	B
FLAMMULATED OWL	<i>OTUS FLAMMEOLUS</i>	Bird	none	SC	B,RI
SPOTTED OWL	<i>STRIX OCCIDENTALIS</i>	Bird	FT	SE	IO
VAUX'S SWIFT	<i>CHAETURA VAUXI</i>	Bird	none	SC	B,CR
LEWIS' WOODPECKER	<i>MELANERPES LEWIS</i>	Bird	none	SC	B
PILEATED WOODPECKER	<i>DRYOCOPUS PILEATUS</i>	Bird	none	SC	B
WHITE-HEADED WOODPECKER	<i>PICOIDES ALBOLARVATUS</i>	Bird	none	SC	B,RI
BLACK-BACKED WOODPECKER	<i>PICOIDES ARCTICUS</i>	Bird	none	SC	B,RI
PURPLE MARTIN	<i>PROGNE SUBIS</i>	Bird	none	SC	B
SLENDER-BILLED WHITE-BREADED NUTHATCH	<i>SITTA CAROLINENSIS ACULEATA</i>	Bird	FCo	SC	IO
LOGGERHEAD SHRIKE	<i>LANIUS LUDOVICIANUS</i>	Bird	FCo	SC	B
OREGON VESPER SPARROW	<i>POOECETES GRAMINEUS AFFINIS</i>	Bird	FCo	SC	B
SAGE SPARROW	<i>AMPHISPIZA BELLI</i>	Bird	none	SC	B

SAGE THRASHER	<i>OREOSCOPTES MONTANUS</i>	Bird	none	SC	B
STREAKED HORNED LARK	<i>EREMOPHILA ALPESTRIS STRIGATA</i>	Bird	FC	SE	B
ISLAND MARBLE	<i>EUCHLOE AUSONIDES INSULANUS</i>	Butterfly/Moth	FCo	SC	IO
MAKAH (QUEEN CHARLOTTE) COPPER	<i>LYCAENA MARIPOSA CHARLOTTENSIS</i>	Butterfly/Moth	FCo	SC	IO
PUGET BLUE	<i>PLEBEJUS ICARIOIDES BLACKMOREI</i>	Butterfly/Moth	none	SC	IO
VALLEY SILVERSPOT	<i>SPEYERIA ZERENE BREMNERII</i>	Butterfly/Moth	FCo	SC	IO
GREAT ARCTIC	<i>OENEIS NEVADENSIS GIGAS</i>	Butterfly/Moth	none	SC	IO
OREGON SILVERSPOT BUTTERFLY	<i>SPEYERIA ZERENE HIPPOLYTA</i>	Butterfly/Moth	FT	SE	IO
MARDON SKIPPER	<i>POLITES MARDON</i>	Butterfly/Moth	FC	SE	IO
SHEPARD'S PARNASSIAN	<i>PARNASSIUS CLODIUS SHEPARDI</i>	Butterfly/Moth	none	SC	IO
SILVER-BORDERED FRITILLARY	<i>BOLORIA SELENE ATROCOSTALIS</i>	Butterfly/Moth	none	SC	IO
JOHNSON'S HAIRSTREAK	<i>MITOURA JOHNSONI</i>	Butterfly/Moth	none	SC	IO
JUNIPER HAIRSTREAK	<i>MITOURA GRYNEA BARRYI</i>	Butterfly/Moth	none	SC	IO
CHINQUAPIN HAIRSTREAK	<i>HABRODAIS GRUNUS HERRI</i>	Butterfly/Moth	none	SC	IO
YUMA SKIPPER	<i>OCHLODES YUMA</i>	Butterfly/Moth	none	SC	IO
TAYLOR'S CHECKERSPOT	<i>EUPHYDRYAS EDITHA TAYLORI</i>	Butterfly/Moth	FC	SE	IO
SAND-VERBENA MOTH	<i>COPABLEPHARON FUSCUM</i>	Butterfly/Moth	none	SC	IO
RIVER LAMPREY	<i>LAMPETRA AYRESI</i>	Fish	FCo	SC	IO
PACIFIC HERRING (CHERRY POINT)	<i>CLUPEA PALLASI</i>	Fish	FC	SC	IO
PACIFIC HERRING (DISCOVERY BAY)	<i>CLUPEA PALLASI</i>	Fish	FC	SC	IO
CHUM SALMON (HOOD CANAL SU)	<i>ONCORHYNCHUS KETA</i>	Fish	FT	SC	none
CHUM SALMON (LOWER COLUMBIA)	<i>ONCORHYNCHUS KETA</i>	Fish	FT	SC	none
COHO SALMON (LOWER COLUMBIA/SW WA)	<i>ONCORHYNCHUS KISUTCH</i>	Fish	FC	none	none
SOCKEYE SALMON (SNAKE R.)	<i>ONCORHYNCHUS NERKA</i>	Fish	FE	SC	none
SOCKEYE SALMON (OZETTE LAKE)	<i>ONCORHYNCHUS NERKA</i>	Fish	FT	SC	none
CHINOOK SALMON (PUGET SOUND)	<i>ONCORHYNCHUS TSHAWYTSCHA</i>	Fish	FT	SC	none
CHINOOK SALMON (UPPER COLUMBIA SP)	<i>ONCORHYNCHUS TSHAWYTSCHA</i>	Fish	FE	SC	none
CHINOOK SALMON (LOWER COLUMBIA)	<i>ONCORHYNCHUS TSHAWYTSCHA</i>	Fish	FT	SC	none
CHINOOK SALMON (SNAKE R. SP/SU)	<i>ONCORHYNCHUS TSHAWYTSCHA</i>	Fish	FT	SC	none
CHINOOK SALMON (SNAKE R. FALL)	<i>ONCORHYNCHUS TSHAWYTSCHA</i>	Fish	FT	SC	none
STEELHEAD (SNAKE RIVER)	<i>ONCORHYNCHUS MYKISS</i>	Fish	FT	SC	none
STEELHEAD (MIDDLE COLUMBIA)	<i>ONCORHYNCHUS MYKISS</i>	Fish	FT	SC	none
STEELHEAD (UPPER COLUMBIA)	<i>ONCORHYNCHUS MYKISS</i>	Fish	FT	SC	none
STEELHEAD (PUGET SOUND)	<i>ONCORHYNCHUS MYKISS</i>	Fish	FT	.	none
STEELHEAD (LOWER COLUMBIA)	<i>ONCORHYNCHUS MYKISS</i>	Fish	FT	SC	none
BULL TROUT	<i>SALVELINUS CONFLUENTUS</i>	Fish	FT	SC	none
BULL TROUT (COLUMBIA BASIN)	<i>SALVELINUS CONFLUENTUS</i>	Fish	FT	SC	none
BULL TROUT (COASTAL/PUGET SOUND)	<i>SALVELINUS CONFLUENTUS</i>	Fish	FT	SC	none
EULACHON	<i>THALEICHTHYS PACIFICUS</i>	Fish	none	SC	RC
OLYMPIC MUDMINNOW	<i>NOVUMBRA HUBBSI</i>	Fish	none	SS	IO
PYGMY WHITEFISH	<i>PROSOPIUM COULTERI</i>	Fish	FCo	SS	IO
LAKE CHUB	<i>COUESIUS PLUMBEUS</i>	Fish	none	SC	IO
LEOPARD DACE	<i>RHINICHTHYS FALCATUS</i>	Fish	none	SC	IO
UMATILLA DACE	<i>RHINICHTHYS UMATILLA</i>	Fish	none	SC	IO
MOUNTAIN SUCKER	<i>CATOSTOMUS PLATYRHYNCHUS</i>	Fish	none	SC	IO
PACIFIC COD (S&C PUGET SOUND)	<i>GADUS MACROCEPHALUS</i>	Fish	FCo	SC	IO
PACIFIC HAKE (C. PUGET SOUND)	<i>MERLUCCIIUS PRODUCTUS</i>	Fish	FCo	SC	IO
WALLEYE POLLOCK (SO. PUGET SOUND)	<i>THERAGRA CHALCOGRAMMA</i>	Fish	FCo	SC	IO
BROWN ROCKFISH	<i>SEBASTES AURICULATUS</i>	Fish	FCo	SC	IO
COPPER ROCKFISH	<i>SEBASTES CAURINUS</i>	Fish	FCo	SC	IO

GREENSTRIPED ROCKFISH	<i>SEBASTES ELONGATUS</i>	Fish	none	SC	IO
WIDOW ROCKFISH	<i>SEBASTES ENTOMELAS</i>	Fish	none	SC	IO
YELLOWTAIL ROCKFISH	<i>SEBASTES FLAVIDUS</i>	Fish	none	SC	IO
QUILLBACK ROCKFISH	<i>SEBASTES MALIGER</i>	Fish	FCo	SC	IO
BLACK ROCKFISH	<i>SEBASTES MELANOPS</i>	Fish	none	SC	IO
CHINA ROCKFISH	<i>SEBASTES NEBULOSUS</i>	Fish	none	SC	IO
TIGER ROCKFISH	<i>SEBASTES NIGROCINCTUS</i>	Fish	none	SC	IO
BOCACCI ROCKFISH	<i>SEBASTES PAUCISPINIS</i>	Fish	none	SC	IO
CANARY ROCKFISH	<i>SEBASTES PINNIGER</i>	Fish	none	SC	IO
REDSTRIPE ROCKFISH	<i>SEBASTES PRORIGER</i>	Fish	none	SC	IO
YELLOWEYE ROCKFISH	<i>SEBASTES RUBERRIMUS</i>	Fish	none	SC	IO
MARGINED SCULPIN	<i>COTTUS MARGINATUS</i>	Fish	FCo	SS	IO
MERRIAM'S SHREW	<i>SOEX MERRIAMII</i>	Mammal	none	SC	IO
KEEN'S MYOTIS	<i>MYOTIS KEENII</i>	Mammal	none	SC	B,IO
TOWNSEND'S BIG-EARED BAT	<i>CORYNORHINUS TOWNSENDII</i>	Mammal	FCo	SC	B,CR
PACIFIC TOWNSEND'S BIG-EARED BAT	<i>CORYNORHINUS TOWNSENDII TOWNSENDII</i>	Mammal	FCo	SC	B,CR
PALLID TOWNSEND'S BIG-EARED BAT	<i>CORYNORHINUS TOWNSENDII PALLESCENS</i>	Mammal	FCo	SC	B,CR
PYGMY RABBIT	<i>BRACHYLAGUS IDAHOENSIS</i>	Mammal	FE	SE	IO
WHITE-TAILED JACKRABBIT	<i>LEPUS TOWNSENDII</i>	Mammal	none	SC	IO
BLACK-TAILED JACKRABBIT	<i>LEPUS CALIFORNICUS</i>	Mammal	none	SC	IO
WESTERN GRAY SQUIRREL	<i>SCIURUS GRISEUS</i>	Mammal	FCo	ST	IO
WASHINGTON GROUND SQUIRREL	<i>SPERMOPHILUS WASHINGTONI</i>	Mammal	FC	SC	IO
TOWNSEND'S GROUND SQUIRREL	<i>SPERMOPHILUS TOWNSENDII TOWNSENDII</i>	Mammal	none	SC	IO
MAZAMA (WESTERN) POCKET GOPHER	<i>THOMOMYS MAZAMA</i>	Mammal	FC	ST	IO
SHELTON POCKET GOPHER	<i>THOMOMYS MAZAMA COUCHI</i>	Mammal	FC	ST	IO
OREGON POCKET GOPHER	<i>THOMOMYS MAZAMA OREGONUS</i>	Mammal	none	ST	IO
CATHLAMET POCKET GOPHER	<i>THOMOMYS MAZAMA LOUIEI</i>	Mammal	FC	ST	IO
OLYMPIC POCKET GOPHER	<i>THOMOMYS MAZAMA MELANOPS</i>	Mammal	FC	ST	IO
YELM POCKET GOPHER	<i>THOMOMYS MAZAMA YELMENSIS</i>	Mammal	FC	ST	IO
GRAY-TAILED VOLE	<i>MICROTUS CANICAUDUS</i>	Mammal	none	SC	IO
GRAY WOLF	<i>CANIS LUPUS</i>	Mammal	FE	SE	IO
GRIZZLY BEAR	<i>URSUS ARCTOS</i>	Mammal	FT	SE	IO
FISHER	<i>MARTES PENNANTI</i>	Mammal	FC	SE	IO
WOLVERINE	<i>GULO GULO</i>	Mammal	FCo	SC	IO
SEA OTTER	<i>ENHYDRA LUTRIS</i>	Mammal	FCo	SE	B,RI,RSC
SEA OTTER	<i>ENHYDRA LUTRIS LUTRIS</i>	Mammal	none	SE	B,RI,RSC
LYNX	<i>LYNX CANADENSIS</i>	Mammal	FT	ST	IO
GRAY WHALE	<i>ESCHRICHTIUS ROBUSTUS</i>	Mammal	none	SS	IO
SEI WHALE	<i>BALAENOPTERA BOREALIS</i>	Mammal	FE	SE	IO
FIN WHALE	<i>BALAENOPTERA PHYSALUS</i>	Mammal	FE	SE	IO
BLUE WHALE	<i>BALAENOPTERA MUSCULUS</i>	Mammal	FE	SE	IO
HUMPBACK WHALE	<i>MEGAPTERA NOVAEANGLIAE</i>	Mammal	FE	SE	IO
BLACK RIGHT WHALE	<i>BALAENA GLACIALIS</i>	Mammal	FE	SE	IO
KILLER WHALE	<i>ORCINUS ORCA</i>	Mammal	FE	SE	IO
PACIFIC HARBOR PORPOISE	<i>PHOCOENA PHOCOENA</i>	Mammal	none	SC	RSC
SPERM WHALE	<i>PHYSETER MACROCEPHALUS</i>	Mammal	FE	SE	IO
COLUMBIAN WHITE-TAILED DEER	<i>ODOCOILEUS VIRGINIANUS LEUCURUS</i>	Mammal	FE	SE	IO
WOODLAND CARIBOU	<i>RANGIFER TARANDUS</i>	Mammal	FE	SE	IO
STELLER SEA LION	<i>EUMETOPIAS JUBATUS</i>	Mammal	FT	ST	RSC
PINTO ABALONE	<i>HALIOTIS KAMTSCHATKANA</i>	Mollusk	FCo	SC	IO
OLYMPIA OYSTER	<i>OSTREA LURIDA</i>	Mollusk	none	SC	IO
GIANT COLUMBIA RIVER LIMPET	<i>FISHEROLA NUTTALLI</i>	Mollusk	none	SC	IO
GREAT COLUMBIA SPIRE SNAIL	<i>FLUMINICOLA COLUMBIANA</i>	Mollusk	FCo	SC	IO
BLUE-GRAY TAILDROPPER	<i>PROPHYSAON COERULEUM</i>	Mollusk	none	SC	IO
COLUMBIA OREGONIAN	<i>CRYPTOMASTIX HENDERSONI</i>	Mollusk	none	SC	IO
POPLAR OREGONIAN	<i>CRYPTOMASTIX POPULI</i>	Mollusk	none	SC	IO

DALLES SIDEBAND	<i>MONADENIA FIDELIS MINOR</i>	Mollusk	none	SC	IO
NEWCOMB'S LITTORINE SNAIL	<i>ALGAMORDA SUBROTUNDATA</i>	Mollusk	FCo	SC	IO
CALIFORNIA FLOATER	<i>ANODONTA CALIFORNIENSIS</i>	Mollusk	FCo	SC	IO
COLUMBIA CLUBTAIL	<i>GOMPHUS LYNNAE</i>	Other Insect	FCo	SC	IO
COLUMBIA RIVER TIGER BEETLE	<i>CICINDELA COLUMBICA</i>	Other Insect	none	SC	IO
BOG IDOL LEAF BEETLE	<i>DONACIA IDOLA</i>	Other Insect	none	SC	IO
HATCH'S CLICK BEETLE	<i>EANUS HATCHI</i>	Other Insect	FCo	SC	IO
BELLER'S GROUND BEETLE	<i>AGONUM BELLERI</i>	Other Insect	FCo	SC	IO
MANN'S MOLLUSK-EATING GROUND BEETLE	<i>SCAPHINOTUS MANNII</i>	Other Insect	none	SC	IO
WESTERN POND TURTLE	<i>CLEMMYS MARMORATA</i>	Reptile	FCo	SE	IO
LEATHERBACK SEA TURTLE	<i>DERMOCHELYS CORIACEA</i>	Reptile	FE	SE	IO
GREEN SEA TURTLE	<i>CHELONIA MYDAS</i>	Reptile	FT	ST	IO
SAGEBRUSH LIZARD	<i>SCELOPORUS GRACIOSUS</i>	Reptile	FCo	SC	IO
LOGGERHEAD SEA TURTLE	<i>CARETTA CARETTA</i>	Reptile	FT	ST	IO
SHARPTAIL SNAKE	<i>CONTIA TENUIS</i>	Reptile	FCo	SC	IO
STRIPED WHIPSNAKE	<i>MASTICOPHIS TAENIATUS</i>	Reptile	none	SC	IO
CALIFORNIA MOUNTAIN KINGSNAKE	<i>LAMPROPELTIS ZONATA</i>	Reptile	none	SC	IO

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