

BURNED AREA EMERGENCY RESPONSE PLAN REVIEW AND APPROVAL

I. Project Leader approval that the Burned Area Emergency Response Plan meets approved land management plan management objectives.

Gregory M. Hughes, Project Leader, MID-COLUMBIA RIVER NWR COMPLEX

Date

II. Regional Fire Management Coordinator concurrence that the plan fits the technical definition for use of Emergency Stabilization funding.

Regional Fire Management Coordinator, Region 1

Date

III. Emergency Stabilization Funding Approval (check one box below):

Approved

Approved with Revision (see attached)

Disapproved

Regional Director, Region 1

Date

IV. Emergency Stabilization Funding Approval (check one box below):

Approved

Approved with Revision (see attached)

Disapproved

National Office

Date

BOBCAT FIRE
BURNED AREA EMERGENCY RESPONSE PLAN



UNIT: COLUMBIA NATIONAL WILDLIFE REFUGE

LOCATION: Othello, Adams County, Washington

DATE: October 1, 2007

PREPARED BY: FIRST STRIKE ENVIRONMENTAL CO. (FSE)

Submitted By: _____
Leo Sidebotham, Team Leader/FSE

Date: October 1, 2007

EXECUTIVE SUMMARY

Introduction

This Burned Area Emergency Response Plan has been prepared in accordance with Department of the Interior and U.S. Fish and Wildlife Service policy. This plan provides emergency stabilization recommendations for all lands burned within the Bobcat Fire perimeter and downstream impact areas including: public lands administered by the U.S. Fish and Wildlife Service and other jurisdictions if necessary. The primary objectives of the Bobcat Fire Burned Area Emergency Response 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 in accordance with approved land management plans and policies, and all relevant federal, state, and local laws and regulations.
- Minimize the establishment of non-native invasive species within the burned area.

Emergency Stabilization

This plan addresses the emergency stabilization and fire suppression impacts/ fire related damages to lands administered by the U.S. Fish and Wildlife Service on the Columbia National Wildlife Refuge (Refuge). Based upon field assessments conducted by Refuge staff from July 13, 14, 18, and August 1, 2007, an analysis was conducted to include: suppression impacts, archaeological and vegetation impacts, fire effects on known threatened and endangered (T&E) species and their habitats. U.S. Fish and Wildlife Service archeologists examined records of previously recorded cultural resources within the fire boundaries and initiated a cultural resource damage assessment. The wildlife biologist/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 GIS specialist gathered data layers and produced relevant maps. The wildlife biologist conducted an assessment of T&E species, and other species of management concern to the Refuge.

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

Fire Background

The Bobcat Fire, Number 13580-9141-DQJ0 was reported on July 13, 2007 at

approximately 1245 hours. There were two fires ignited in the immediate vicinity by a passing thunder cell and the associated lightning. By 1600 hours that day the two fires had burned together and became the Bobcat Fire. The other fire that merged with the Bobcat Fire was the Highway 26 Fire, fire number 13580-9141-DSZ5. The Highway 26 fire demonstrated extreme fire intensity on 90% of the burned area as it was pushed through the shrub-steppe community by gusting and fire generated convective winds. The original Bobcat Fire was actually stopped at around 10 acres before being consumed by the Highway 26 fire. The majority of this fire burned on private land but approximately 250 acres burned in Management Unit IV and approximately 264 acres burned in Management Unit III. Approximately 1,386 acres burned on private land, mainly on the east and west flanks of the fire for a total of 1,900 acres, per U.S. Fish and Wildlife Service Maps #1 and #4, Appendix III. Access on both the north and south ends of this fire proved to be difficult for suppression resources as the fire burned in some very rugged, cliffy, and rocky terrain.

Firefighters from Adams County and multiple Grant County fire districts responded to this incident. A private bulldozer was also used on the east flank of the fire. The majority of the engines were used on the north end of the fire for containment as well as the bodies of water (Hutchinson and Shiner Lake). Crab Creek held the fire in check on the west flank.

Adams County resources along with U.S. Fish and Wildlife Service resources initial attacked the Bobcat Fire, containing it at around 10 acres. Grant County resources initial attacked the Highway 26 fire, finding that containment efforts were proving to be difficult due to the rough terrain and the gusting erratic winds. Eventually the engines could go no further up the flanks so the bulldozer took over from there, putting blade line in up through the FWS property on the east flank of the fire. This method proved to be successful in stopping the flanking spread of the fire.

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

- Cultural and natural resource values impacted by the fire or fire suppression actions.
- ES requirements established by Federal law, policies, and relevant Department of the Interior resource management mandates.
- Rehabilitation requirements established by state laws, policies, and regulations. Implementation of treatments in a timely manner, prior to the first damaging winds and rains.
- Implementation of treatments in a timely manner, prior to the first damaging winds and rains.

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

The Bobcat Fire burned approximately 514 acres of the Columbia Refuge. Though the fire was contained on July 15, 2007 the field assessment was delayed until August 1, 2007 partly due to the road damage from fire suppression activities causing it to be inaccessible and partly due to an initial attempt to contract out a BAER/ESR plan which was not carried through. An extension for completion of the plan was requested.

Three factors stood out while traveling through the burned area. First, the soils are very fragile and were damaged after just a few fire vehicles passed over the same track, which required establishing new areas to drive on and increased damages. Second, many burned areas also will be difficult to rehabilitate because of slopes, talus, and rocky conditions. And third, this fire consumed or killed nearly every single shrub in its path, indicating extreme fire severity.

Ground disturbance along the fire edge was substantial given the fire location and the necessary fire suppression actions (i.e. bulldozing actions) that were employed to prevent the loss of additional acres. Approximately 2.5 miles of dozer line was employed during the fire suppression action on the east flank. 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. A total of 5 acres (based on 16-foot width) were impacted due to dozer line suppression during the Bobcat Fire.

The road and fence damage assessments are based on field observations and discussions with Randy Hill and Rick Poetter, U.S. Fish and Wildlife Service. Approximately 1.2 miles of gravel roads and 8 miles of ungraveled access roads were damaged from suppression activities. Off-road soil/vegetation damage was observed on approximately 3 miles of newly created tracks. In addition, a 0.5 acre staging area was damaged/denuded by fire-related vehicles. Fence damage is generally restricted to short sections where the fence was cut to allow fire suppression vehicles access.

The fire damage to vegetation can be summarized as follows:

- Approximately 95 to 98 percent (%) of the area within the fire limits was burned.
- Approximately 45 to 50% of the burned area is susceptible to wind erosion.
- Burn intensities for the area burned can be divided into: 5% low intensity, 25 to 40% moderate intensity, and 50 to 70% severe intensity.
- Approximately 95 to 100% of the vegetation was burned. Regeneration success for bunch grass is anticipated to be 40% and cheat grass is anticipated to be greater than 50%. Invasive species appear to be regenerating along the riparian areas.

A high mortality rate is expected of the remaining sagebrush within the Fire margin by heat scorch because of the plants' sensitivity to fire. Additionally noted is that sagebrush does not tolerate fire and only re-sprouts from seed. Shrubs that had persisted at the base of cliffs and rock outcrops were mostly consumed. Sandberg's bluegrass was widespread, but most areas were dominated by cheatgrass due to grazing history and past fires. (Hill 2007). Most sagebrush, bunchgrass, and cheatgrass communities experienced 95 to 100 percent vegetation loss of above-ground cover or vegetative resources within the Fire boundary.

Shrubs generally burned to the ground except where highly alkaline soils were dominated by saltgrass and greasewood in depressions close to Hutchinson and Shiner Lakes, and where isolated greasewood had little fuel understory. White ash indicating very hot and

complete combustion was the norm in areas in the northwest corner, and even areas where bluegrass dominated lithosols there was complete thorough burn. Other than cheatgrass, other invasive species noted except in the south area where Russian knapweed is widely scattered across the landscape. Introduction of alien species is a concern where so much exposed area is now open to complete invasion by noxious weeds and invasive plants.

Fire Severity	Percent Affected
Low	5%
Medium	25-45%
High	50-70%

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

- a) Potential for invasion by aggressive non-native species throughout the disturbed site.
- b) Impacts to native shrub, and grass species during suppression and mop-up activities.
- c) Vegetation losses and microbiotic crust loss 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.
- d) Loss of the organic litter layer on approximately 95 percent of the Fire area.

The role of microbiotic crusts (MBC) in shrub-steppe ecosystems is still incompletely understood (Evans and Lih 2005:106) and estimating the magnitude and extent of MBC damage from the Bobcat Fire is a complex task that is beyond the scope of BAER field survey and assessment. Therefore, this assessment can make no definitive conclusions about the area wide condition and location of the MBC and the emergency stabilization measures recommended reflect this finding.

Negative impacts resulting from vegetation losses include a reduction in wildlife habitat, forage for wildlife species, visual quality degradation, increased non-native species invasion, bare 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.

The Fire presents a large-scale disturbance and created new open sites vulnerable to weed invasion, creating 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 of native vegetation are likely become established and/or spread within the burned area.

Concern has been expressed over the loss of vegetation cover within the Bobcat Fire area.

Stabilization and re-vegetation of those areas is needed to ensure ecological function. Revegetation in the area should be conducted in order to protect soils in the area reducing the erosional affects that wind and water can generate.

Emergency stabilization includes application of pesticide spray to significantly reduce invasive weed spread and diminish threats in areas of concern from noxious weeds and non-native species. After the spray aerial and drill seeding of native plants mix to establish prolific native colonies and minimize invasive weed infestation into non-infested areas.

None of the wetland or riparian areas were impacted by the Fire. Due to the lowered intensity burn near the associated areas and the inherent fire retarding abilities of wetland vegetation, neither of these resources was harmed. However, the areas surrounding the wetland and riparian resources were impacted and emergency stabilization of the surrounding shrub-steppe habitat is recommended to avoid erosion damage.

The significant wildlife species under the jurisdiction of the Refuge that are known to occur or have the potential to occur in the fire area during at least portions of the year include:

- Bald eagle (*Haliaeetus leucocephalus*)
- Washington ground squirrel (*Spermophilus washingtoni*)
- Ferruginous hawk (*Buteo regalis*)
- Loggerhead shrike (*Lanius ludovicianus*)
- Striped whipsnake (*Masticophis taeniatus*)
- Black-tailed jackrabbit (*Lepus californicus*)
- Mule deer (*Odocoileus hemionus*)

Although the Bobcat Fire had no effect on bald eagles either directly or indirectly, this area is potential habitat for Washington ground squirrels, ferruginous hawk, loggerhead shrikes , striped whipsnake, black-tailed jackrabbit and of tribal importance to mule deer. The habitat of the above selected wildlife has been functionally damaged by the fire and the emergency stabilization measures recommended in the vegetation assessment is necessary for the recovery of these areas to pre-fire condition.

The U.S. Fish and Wildlife Service Cultural Resources Team (CRT) conducted a record search of maps and site forms on file at the CRT office for the area encompassed by the Bobcat Fire on August 13, 2007. A records search at the Washington State Department of Archaeology and Historic Preservation was also conducted on August 14, 2007. In addition, an analysis of the potential effects of the fire on cultural resources was conducted. It was determined that fire suppression activities such as the excavation of fire dozer line and the damage of the two-track road from vehicular traffic may have disturbed or displaced elements of unrecorded cultural resources.

Although several small scaled Section 106 compliance surveys have been completed for the Mid-Columbia NWR Complex, very few historic and prehistoric sites have been recorded within its boundaries. The sites that have been identified include open air sites with possible house pit depressions, rock shelters/features, and an abandoned homestead

site with only remnants of the concrete foundation.

A records search at the Washington SHPO did not identify any previously recorded historic sites within or adjacent to the Bobcat Fire area. Portions of the historic Caribou Trail are adjacent to the north portion of the loop road, and repairs will require Cultural Resource review before implementation. Conducting this condition assessment will fulfill federal laws and regulations governing cultural resources.

Emergency Stabilization Treatments

Based on the findings of the respective assessments, the following emergency stabilization treatments are recommended:

- Conduct cultural compliance prior to implementation of stabilization treatments.
- Stabilize soil to prevent loss or degradation of productivity by seeding to prevent establishment of invasive plants; and by using integrated pest management techniques to minimize the establishment of non-native invasive species within the burned area.

The major impediments to implementing the recommended ES measures include steep slopes and access to selected areas using existing roads.

COLUMBIA NATIONAL WILDLIFE REFUGE Management Requirements

Establishing legislation designated Columbia National Wildlife Refuge "... as a refuge and breeding ground for migratory birds and other wildlife..." the uniqueness and biological diversity of the Refuge is established by three elements of land management. First, this area was set aside from irrigated agricultural development during planning stages of the Columbia basin irrigation Project due to its strategic location along the Potholes Canal and Crab Creek. Second, it lies within a mostly rocky area that has maintained the shrug-steppe component in a relatively large block with State-managed and private lands. Third, unlike surrounding properties the Refuge lands have not been intentionally grazed for nearly 25 years, protecting bunchgrass and sagebrush stands from degradation. Within its mosaic of habitats, the Refuge supports a wealth of increasingly uncommon native plant and animal species. Because of the high diversity of native plant and animal species, the well developed microbiotic crusts and significant breeding populations of many steppe and shrub-steppe dependent species, the service has been tasked to preserve and protect these lands for future generations. Primary goals for the Refuge include:

- Provide habitat for migratory birds, especially ducks, geese, swans, and cranes, during the spring/fall staging and winter periods.

- Protect, restore and develop habitats for an otherwise support the recovery of federally-listed endangered and threatened species, and help prevent the listing of species of management concern.
- Protect and restore a diversity of native habitats for indigenous fish, wildlife, and plants within the Columbia Basin ecoregion.
- Provide high-quality opportunities for wildlife-dependent recreation and environmental education to enhance public appreciation, understanding, and enjoyment of fish, wildlife, habitats, and cultural resources.

The emergency stabilization measures recommended in this ES Plan are consistent with and help fulfill the local planning agency goals/objectives including the Columbia National Wildlife Refuge management requirements, Federal and State Threatened and Endangered Species regulations, and cultural resource restrictions:

- Noxious weed and invasive species control to protect the habitat of T&E vegetation and wildlife of the site.
- Ecological stabilization through planting of native species to prevent the re-establishment and spread of non-native invasive plants (Appendix I and V).
- Conduct cultural compliance prior to implementation of stabilization treatments.
- Monitor treatment effectiveness for site stabilization.

Application of herbicide and planting of native seeds (including aerial seeding) to restore areas before invasive species become established is well supported by recent research (Bakker & Wilson, 2004:1058-1064) (Huddleston & Young 2005:507-515) (Thompson & Rounding, 2006) (Seabloom & Harpole 2003).

Evans and Lih (2005) findings/conclusions support the recommended Bobcat Fire ES measures over natural recovery:

- Careful management and a long term commitment to integrated and adaptive approaches to invasive species management, fire management and restoration practices will be required to successfully manage the ALE Reserve and other shrub-steppe ecosystems in the coming years.
- Aggressive management activity to control cheatgrass and to enhance the recovery of natural structure and function of sagebrush shrubland stands will be critical to the long-term ecological integrity of these habitats.
- The problem of cheatgrass must be addressed in relation to native plant community health and fire management practices. There are no simple answers; no permanent solution to the problem of cheatgrass control is currently available and management is extremely challenging.
- The rates of grass seedling emergence and recruitment from aerial seeding efforts observed in the study are probably typical of broadcast seeding efforts in the arid West. (*This infers that aerial seeding is a typical broadcast seeding practice in similar areas of the Western U.S.*).

West. (*This infers that aerial seeding is a typical broadcast seeding practice in similar areas of the Western U.S.*).

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PART A - FIRE LOCATION AND BACKGROUND INFORMATION

Fire Name	BOBCAT
Fire Number	13580-9141-DQJ0
Agency Unit	U.S. Fish and Wildlife Service, Mid-Columbia River National Wildlife Refuge Complex
Region	USFWS Region 1
State	WA
County(s)	Adams
Ignition Date/Cause	7/13/07 - lightning
Zone	CWICC
Date Fully Contained	7/15/2007
Jurisdiction	Acres
COLUMBIA NATIONAL WILDLIFE REFUGE	514
Adams County Fire District 5 (private)	1,386
<i>other jurisdictions</i>	
Total Acres	1,900
Date Contained	7/15/2007

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

- *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 in accordance with approved land management plans and policies, and all relevant federal, state, and local laws and regulations.*
- *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	Leo Sidebotham (FSE)
Public Information	Paula Call (USFWS)
Operations	Gary Fegert, USFWS/Randy Hill (USFWS)
Environmental Compliance & Planning	Robert Krueger (FSE)
NEPA Advisor	
Hydrologist/Geologist	Craig Fanshier (FSE/Shaw)
Watershed Scientist	Wayne Coppel (FSE/Shaw)
Soil Scientist	Randy Hill (USFWS)/Todd Martin (FSE/Shaw)
Cultural Resources/Archeologist	Jorie Clark (USFWS)
Vegetation Specialist	Randy Hill, Heidi Newsome (USFWS)/Rebecca Meyers (FSE/Shaw)
Wildlife Biologist	Randy Hill, Howard Browers (USFWS)/Bruce Kvam (FSE/Shaw)
GIS Specialist	Lindsey Hayes, Kevin Goldie, Andrew Stinchfield (USFWS)
Documentation/Computer Specialist	Michele Krueger, Lori Lane, Lori Onate (FSE)/Wayne Coppel (FSE/Shaw)
Photographer	Randy Hill (USFWS)/ Craig Fanshier, Todd Martin (FSE/Shaw)

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
Rick Poetter	Refuge Manager, U.S. Fish and Wildlife Service
Chris Schulte	Fire Management Officer, Mid-Columbia River National Wildlife Refuge Complex
Mike Ritter	Deputy Project Leader, Mid-Columbia River National Wildlife Refuge Complex
Howard Browers	Biologist, U.S. Fish and Wildlife Service
Erika Britney	Senior Review, FSE/Shaw (Wildlife, Vegetation)
Debra Carey	Senior Review, FSE/Shaw (Hydrology, Geology)

PART F - INDIVIDUAL SPECIFICATIONS

TREATMENT/ACTIVITY NAME	Conduct cultural compliance		
NFPORS TREATMENT CATEGORY*	Heritage Resources	FISCAL YEAR(S) (list each year):	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: A records search at the Washington SHPO did not identify any previously recorded historic sites within or adjacent to the Bobcat fire area. Conduct cultural compliance prior to implementation of stabilization treatments</p> <p>B. Location/(Suitable) Sites: The study area for the cultural resource is the burn area (514 acres).</p> <p>C. Design/Construction Specifications:</p> <ol style="list-style-type: none"> 1. Conduct cultural compliance prior to implementation of stabilization treatments, 47-acres per day, per Spencer Lodge of USFWS. 2. Evaluate and document findings. 3. Conduct Tribal consultation. <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>
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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 and Project Manager 96-hours @ \$80/hour	7,680.00
Crew Chief 60 hours @ \$50/hour	3,000.00
Crew 60 hours @ \$28/hour	1,620.00
FWS Tribal consultation/interviews \$400/day for 2 days	800.00
TOTAL PERSONNEL SERVICE COST	13,100.00
➤ 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	
	COST /

A. ➤ TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item):		ITEM
4 X 4 Pickup @ .485/mile x 100 miles/day x 10 days x 1 FY's –Field visits		485.00
ATV Unit @ \$100/day x 10-days		1,000.00
2 each- Round Trip travel from Regional Cultural Resources Office in Sherwood Oregon : 490 Miles @ .485/mile		465.60
Per diem Lodging and meals, Richland Washington 10 days (lodging \$60/day and Meals & incidentals \$50/day)		1,100.00
TOTAL TRAVEL COST		3,050.60
➤ CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):		COST / ITEM
TOTAL CONTRACT COST		3,050.60

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	FA	Acres	31.40	514	16,150.60
TOTAL							16,150.60

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

SOURCE OF COST ESTIMATE

1.	Estimate obtained from 2-3 independent contractual sources.	
2.	Documented cost figures from similar project work obtained from local agency sources.	P
3.	Estimate supported by cost guides from independent sources or other federal agencies	
4.	Estimates based upon government wage rates and material cost.	
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, Columbia Refuge	514	\$16,150.60
	TOTAL COST	\$16,150.60

PART F - INDIVIDUAL SPECIFICATION

TREATMENT/ACTIVITY NAME	Non-native invasive species control-Integrated Pest Management	PART E SPECIFICATION #	2
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	Shrub-steppe	IMPACTED T&E SPECIES	Washington ground squirrel (Candidate), Ferruginous hawk (Species of concern)

* 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: The specification will stabilize soil to prevent loss or degradation of productivity by direct treatment of invasive plants by using integrated pest management techniques to minimize the establishment of non-native invasive species within the burned area. Control noxious weed infestations remaining within Bobcat Fire area prior to seed-set and maturation. Control new infestations in fall of 2007 and spring of 2008. Current weed species observed include Russian knapweed (<i>Centaurea diffusa</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 reseeding efforts.</p> <p>B. Location/(Suitable Site): Control all visible noxious weed populations along roads, trails and disturbed sites within the fire area. Control sites identified include dozer lines, disk lines, and known infestations of Russian knapweed, 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: 1. Control known populations of noxious weeds as identified in USFWS reviews (approximately 514- acres of cheatgrass) prior to seed set. 2. Recommended herbicides for Russian knapweed, Kochia, and Russian thistle, within upland shrub-steppe areas, are biological control agents. Recommended herbicide for cheatgrass control is Plateau© (imazapic). Application at low concentrations (3 – 6 oz/acre) during fall/early winter will minimize damage to native species. Adjuvants (e.g., surfactant, drift control agents, de-foaming agents) will be required for all weed treatments. 3. 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 4. Winds in the area to be sprayed should be less than 10 MPH (constant). 5. A buffer of 100 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 6. 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. 7. 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> <p>D. Purpose of Treatment Specifications: Protect the ecological integrity and site productivity of shrub-steppe plant communities and riparian areas within the Columbia NWR 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.</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 (2) x \$30/hour x 40 hours per treatment x 3 treatment periods x 1 year (Backpack spraying work)	7,200.00
Wildlife Biologist (GS-12) x \$39/hour x 40 hours per treatment x 3 treatment monitoring periods x 1 year – treatment monitoring	4,680.00
TOTAL PERSONNEL SERVICE COST	11,880.00
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	1,000.00
TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST	1,000.00

MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item):	COST / ITEM
Plateau, 21- gallons (6 oz/acre x 514 acres) @ \$277/gallon	6,648.00
MSO or MVO Surfactant – 48 gallons @ \$ 16.00/gallon	768.00
Biological Control Agents- Russian Thistle, diffuse knapweed	1,200.00
TOTAL MATERIALS AND SUPPLY COST	8,616.00
TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item):	COST / ITEM
4 X 4 Pickup @ .485/mile x 200 miles/day x 12 days x 1 fiscal year	1,164.00
TOTAL TRAVEL COST	1,164.00
CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):	COST / ITEM
Aerial Application of Herbicide-514 acres X \$30/acre	15,420.00
TOTAL CONTRACT COST	15,420.00

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	9/30/2008	S	Acres	\$74.10	514	38,080.00
						TOTAL	38,080.00

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

SOURCE OF COST ESTIMATE

1.	Estimate obtained from 2-3 independent contractual sources.	
2.	Documented cost figures from similar project work obtained from local agency sources.	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:

List Relevant Documentation and Cross-Reference Location within the Accomplishment Report. Vegetation and Soils Damage Assessment and Wildlife Damage Assessment, Appendix I and Maps, Appendix III.
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TOTAL COST BY JURSDICTION

JURSDICTION	UNITS TREATED	COST
US Fish and Wildlife Service, Mid-Columbia River Refuges Complex, Columbia NWR	514 acres	38,080.00
	TOTAL COST	\$38,080.00

PART F - INDIVIDUAL SPECIFICATION

TREATMENT/ACTIVITY NAME	Ecological Stabilization- Native Seeding	PART E SPECIFICATION #	3
NFPORS TREATMENT CATEGORY*	Invasive Species	FISCAL YEAR(S) (list each year):	2007, 2008
NFPORS TREATMENT TYPE *	Prevention/Seeding	WUI? Y / N	N
IMPACTED COMMUNITIES AT RISK	Shrub-steppe	IMPACTED T&E SPECIES	Washington ground squirrel (Candidate), Ferruginous hawk (Species of concern)

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

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

<p>Number and Describe Each Task:</p> <p>A. General Description: This treatment activity will stabilize soil to prevent loss or degradation of productivity using seeding to prevent establishment of invasive plants within the burned area. Apply native seed mix through drill seeding and ATV broadcast applications in the burned area to stabilize ecological integrity of native shrub steppe community, prevent invasion by noxious weeds and non-native species, and to limit erosion and stabilize soils.</p> <p>B. Location/(Suitable) Sites: The Bobcat Fire area is located in Marsh Units III and IV on the Columbia Refuge. Reseeding should take place across the portions of the fire area (200 acres drill seed and 314 acres aerial seeding, per specific seed mix) that were critical shrub-steppe habitat areas to stabilize soils, limit weed invasion, and promote ecological integrity. See Maps, Appendix III.</p> <p>Design/Construction Specifications:</p> <p>1. Purchase native seed mix: in appropriate amounts to stabilize soils and ecological function according to the following specifications for native seed mix.</p> <p><u>Grasses</u></p> <table> <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>Bottlebrush squirreltail (<i>Elymus elymoides</i>)</td> <td>1.5 lbs./ac PLS</td> </tr> <tr> <td>Bluebunch wheatgrass (<i>Pseudoroegneria spicata</i>)</td> <td>4 lbs./ac PLS</td> </tr> <tr> <td>Sand dropseed</td> <td></td> </tr> </table> <p><u>Shrubs</u></p> <table> <tr> <td>Wyoming Big Sagebrush (<i>Artemisia tridentata</i> ssp. <i>wyomingensis</i>)</td> <td>0.1 lbs/ac PLS</td> </tr> </table> <p>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 (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.</p> <p>3. Delivery: Deliver certified weed-free seed sold on pure live seed basis. Deliver to Columbia Refuge. 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.</p> <p>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.</p> <p>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.</p> <p>Drill Seeding- Approximately 200-acres of the Bobcat fire will be seeded with a rangeland drill on fine sandy loam and loam soils northeastern and southwest of the fire area. Drill seeding operations will be conducted at ½ the aerial application rate.</p> <p>D. Purpose of Treatment Specifications: To stabilize soil to prevent loss or degradation of productivity, and seeding to prevent establishment of invasive plants, and direct treatment of invasive plants.</p> <p>E. Treatment Effectiveness Monitoring Proposed: Monitor to determine effectiveness.</p>	Needle and thread grass (<i>Stipa comata</i>)	0.2 lbs/acre	Sandberg's bluegrass (<i>Poa sandbergii</i>) (Hanford)	2 lbs./ac. PLS	Bottlebrush squirreltail (<i>Elymus elymoides</i>)	1.5 lbs./ac PLS	Bluebunch wheatgrass (<i>Pseudoroegneria spicata</i>)	4 lbs./ac PLS	Sand dropseed		Wyoming Big Sagebrush (<i>Artemisia tridentata</i> ssp. <i>wyomingensis</i>)	0.1 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											
Bottlebrush squirreltail (<i>Elymus elymoides</i>)	1.5 lbs./ac PLS											
Bluebunch wheatgrass (<i>Pseudoroegneria spicata</i>)	4 lbs./ac PLS											
Sand dropseed												
Wyoming Big Sagebrush (<i>Artemisia tridentata</i> ssp. <i>wyomingensis</i>)	0.1 lbs/ac PLS											

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 (2) each (GS-12) @ \$39/hr X 140 Hours X 1 Fiscal year	10,920.00
Maintenance Personnel (2) x \$30/hour x 40-hours x 3.5 weeks (Drill seeding operations)	8,400.00
TOTAL PERSONNEL SERVICE COST	19,320.00
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
Rangeland drill seeders (2), Rental @ \$12/acre x 200- acres plus mobilization \$2,000.00	6,800.00
TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST	6,800.00
MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item):	COST / ITEM
Seed mix @ \$258.68/acre x 314 Aerial seed acres & x 200 drill seed acres at 1/2 PLS rate (~100-acres full rate)	107,093.50
Cultipack rings, bearings, grease, oil, fuel (drill seeding operations)	1,000.00
TOTAL MATERIALS AND SUPPLY COST	108,093.50
TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item):	COST / ITEM
4x4 Truck @ .485/mile x 100-miles/day x 14-days	679.00
TOTAL TRAVEL COST	679.00
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 314 acres plus mobilization cost \$2,000	13,304.00
Effectiveness monitoring. Contract, scientist @ \$50/hour X 3- weeks spring (150 hours) and 3 weeks fall (150 hours)	15,000.00
TOTAL CONTRACT COST	28,304.00

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	07/23/2008	S	Acres	\$317.50	514	163,196.50
						TOTAL	163,196.50

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:

List Relevant Documentation and Cross-Reference Location within the Accomplishment Report. Please refer to Vegetation and Wildlife Assessments, Appendix I and Maps, Appendix III.
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TOTAL COST BY JURSDICTION

JURISDICTION	UNITS TREATED	COST
US Fish and Wildlife Service, Mid-Columbia River Refuges Complex, Columbia NWR	514 acres	163,196.50
TOTAL COST		\$163,196.50

PART F - INDIVIDUAL SPECIFICATION

TREATMENT/ACTIVITY NAME	Emergency Stabilization Plan Development	PART E SPECIFICATION #	4
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	Sage Sparrow, Townsend's Ground Squirrel, Ferruginous Hawk, White-Tailed Jack Rabbit, Greater Sage Grouse

* 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 Bobcat Fire on the Columbia River Refuge.</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 Bobcat 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 ES 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>
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LABOR, MATERIALS AND OTHER COST:

PERSONNEL SERVICES: (Grade @ Cost/Hours X # Hours X # Fiscal Years = Cost/Item): Do not include contract personnel costs here (see contractor services below).	COST / ITEM
TOTAL PERSONNEL SERVICE COST	
EQUIPMENT PURCHASE, LEASE AND/OR RENT (Item @ Cost/Hour X # of Hours X #Fiscal Years = Cost/Item): Note: Purchases require written justification that demonstrates cost benefits over leasing or renting.	COST / ITEM
TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST	
MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item):	COST / ITEM
FWS Assistance and Reports	5,000.00
TOTAL MATERIALS AND SUPPLY COST	5,000.00
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
Contractor Price	27,400.00
TOTAL CONTRACT COST	27,400.00

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
FY07_	7/16/2007	10/15/2007	P	1		1	32,400.00
TOTAL							32,400.00

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

SOURCE OF COST ESTIMATE

1.	Estimate obtained from 2-3 independent contractual sources.	M
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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JURISDICTION	UNITS TREATED	COST
U.S. Fish and Wildlife Service, Mid-Columbia River Refuge Complex, Columbia National Wildlife Refuge	1	32,400.00
	TOTAL COST	\$32,400.00

TOTAL COST BY JURISDICTION

PART G - POST-EMERGENCY STABILIZATION REQUIREMENT (Bobcat fire)

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 service roads (grading, spraying, mowing) (\$ 2,000 - 1262)
2. Maintain fire breaks (\$1,200 -9131)
3. Maintain fences and signs (\$1,200 - 1262)
4. Continue annual invasive species monitoring and control (\$5,000 - 1261)
5. Re-visit and re-take photo monitoring points (GS-09 Wildlife biologist, 16 hours = \$328 - 1261)
6. Monitor native planting (GS-09 Wildlife Biologist, 20 hours = \$410 – 1261)
7. Provide education and interpretation of restoration area (GS-11 Outdoor recreation planner, 2 tours annually, 20 hours = \$510 – 1263)
8. Wildlife Resource monitoring/sensitive species surveys (GS-11 Wildlife Biologist, 80 hours = \$2,040 -1261)
9. Produce publications and reports and coordinate University research related to fire ecology (GS-12 Research biologist, 40 hours annually = \$1,200 -1261)
10. Cultural Resource protection, Law enforcement Officer (GS-9 LE officer, regular patrols once a quarter annually = 32 hours = \$816 - 1264)
11. Continue non-native tree removal, pile and burning (Fire management, fuels reduction, \$600 – 9131)
12. Monitor native grass seeding and natural recovery of forbs. (GS-09 Wildlife biologist, 20 hours = \$410 - 1261)

PART H - CONSULTATIONS

U.S. Fish and Wildlife Service ~ See Appendix I.

APPENDIX I - BURNED AREA ASSESSMENT REPORTS

BURNED AREA EMERGENCY STABILIZATION PLAN BOBCAT FIRE- COLUMBIA NATIONAL WILDLIFE REFUGE

RESOURCE ASSESSMENTS

- **CULTURAL RESOURCE DAMAGE ASSESSMENT**
- **VEGETATION AND SOILS RESOURCE DAMAGE ASSESSMENT**
- **WILDLIFE RESOURCE DAMAGE ASSESSMENT**
- **OPERATIONS RESOURCE ASSESSMENT**
- **WATERSHED AND SOIL DAMAGE ASSESSMENT**
- **WETLAND RIPARIAN RESOURCE ASSESSMENT**



**BURNED AREA EMERGENCY STABILIZATION PLAN
BOBCAT 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 Bobcat Fire, Number 13580-9141-DQJ0 was reported on July 13, 2007 at approximately 1245 hours. There were two fires ignited in the immediate vicinity by a passing thunder cell and the associated lightning. By 1600 hours that day the two fires had burned together and became the Bobcat Fire. The other fire that merged with the Bobcat Fire was the Highway 26 Fire, fire number 13580-9141-DSZ5. The Highway 26 Fire demonstrated extreme fire intensity on 90% of the burned area as it was pushed through the shrub-steppe community by gusting and fire generated convective winds. The original Bobcat Fire was actually stopped at around 10 acres before being consumed by the Highway 26 Fire. The majority of this fire burned on private land but approximately 250 acres burned in Management Unit IV and 362 acres burned in Management Unit III (total of 612 acres of USFWS-managed land). Approximately 1800 acres burned on private land, mainly on the east and west flanks of the fire for a total of 2,412 acres. Access on both the north and south ends of this fire proved to be difficult for suppression resources as the fire burned in some very rugged, cliffy, and rocky terrain. Suppression vehicle damage was extensive due to the constant vehicle traffic on fragile soils. The two-track access road at the south end became impassable even to FWD vehicles rather quickly. Additional roads were created

and broke through the soil which will require stabilization. Access for ESR will require repairing the original road with rock and gravel to handle equipment for the rehabilitation work to proceed. Additional passage outside the original two-track just widened the footprint, crushing sagebrush and exposing more fragile soils to erosion. This occurred on the access road well before reaching the fire perimeter and within several new locations outside the fire boundary. Vehicle tracks and soil disturbance within the burned areas were also extensive.

Ground disturbance along the fire edge was substantial given the fire location and the necessary fire suppression actions (i.e. bulldozing actions) that were employed to prevent the loss of additional acres. Approximately 2.5 miles of dozer line was employed during the fire suppression action on the east flank. 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. A total of 5 acres (based on 16-foot width) were impacted due to dozer line suppression during the Bobcat Fire.

Although several small scaled Section 106 compliance surveys have been completed for the Mid-Columbia NWR Complex, very few historic and prehistoric sites have been recorded within its boundaries. The sites that have been identified include open air sites with possible house pit depressions, rock shelters/features, and an abandoned homestead site with only remnants of the concrete foundation.

The earliest archaeological investigations in the general vicinity of the refuge were completed by Richard Daugherty in 1952 during the construction of the Potholes Reservoir, which is located 7 miles north of the northernmost perimeter of the Bobcat burn area. In 1956, Daugherty's investigations at Lind Coulee (located to the east of Potholes Reservoir) revealed an important archaeological site that demonstrated prehistoric occupation in the Columbia Basin. The Lind Coulee site is on the National Register of Historic Places and remains as one of the few early period sites to have been found and excavated in an upland setting. In closer proximity to the refuge, Irwin and Green (1973) conducted an archaeological survey along Lower Crab Creek for a Bureau of Reclamation water disposal route project under contract with the National Park Service. The survey focused on both sides of Lower Crab Creek, which meanders in and out of the refuge boundaries. Of the 21 archaeological sites they identified and recorded (mostly open air sites with possible house pit depressions and a few rock shelters), four sites appear to be within the boundaries of the refuge. They also noted that amateur looting activities had destroyed many of the potentially valuable sites in the area.

The prehistoric cultural chronology for the Mid-Columbia NWR Complex is based on information related to the nearby Hanford site, 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 have 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).

Although the Bobcat Fire occurred immediately south of Hutchinson and Shriner Lakes, these lakes (as well as all the lakes and ponds on the refuge) were created as a result of Columbia Basin Irrigation Project in the 1940s and are thus not considered to be high probability areas for the presence of unrecorded archaeological sites. 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 life ways 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).

The Historic Period began with the passage of the Lewis and Clark expedition (1805-1806) near the area. Subsequent to this was 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 Bobcat Fire appears to

have been bypassed by historic development in favor of other locations with better access to water.

The part of the Bobcat Fire that occurred in northern portion of the burn area where an undocumented historic trail is located is considered high probability for the presence of previously unrecorded archaeological sites and historic sites.

B. Methodology and Results

The U.S. Fish and Wildlife Service Cultural Resources Team (CRT) conducted a record search of maps and site forms on file at the CRT office for the area encompassed by the Bobcat Fire on August 13, 2007. A records search at the Washington State Department of Archaeology and Historic Preservation was also conducted on August 14, 2007. In addition, an analysis of the potential effects of the fire on cultural resources was conducted. It was determined that fire suppression activities such as the excavation of approximately 500 feet of fire dozer line and the damage of the two-track road from vehicular traffic may have disturbed or displaced elements of unrecorded cultural resources.

Prehistoric Sites

The record search and map analysis determined that there were no previously recorded prehistoric or historic sites in or adjacent to the Bobcat Fire area.

It is recommended that the portion of the fire that occurred on the refuge be surveyed for the presence of previously unreported prehistoric sites. The fire may have made such sites more visible by removing vegetation.

Historic Sites

A records search at the Washington SHPO did not identify any previously recorded historic sites within or adjacent to the Bobcat Fire area. However, an undocumented segment of a historic trail referred to as the Caribou Trail, is reported to be located in the northern portion of the burn area along a two-track road. The source of information that references the Caribou Trail (also known by other names i.e., the Okanogan Trail) thus far is a book entitled "*The Forgotten Trails*" by Ronald M. Anglin. The trail may have been impacted by the activities associated with fire suppression and vehicular traffic. It is recommended that the road be inspected to determine what, if any effects the fire and or activities associated with fire suppression had on the trail.

Since there is no formal site documentation of the historic Caribou Trail, it is recommended that the Caribou Trail be inventoried and evaluated to determine if the fire or suppression activities had adverse effects on them.

Additional Risks

There are no known significant prehistoric or historic sites within the Bobcat Fire area. However, the two-track road that was severely damaged from vehicular traffic during fire suppression actions is in close proximity to the undocumented historic trail. Thus, there is the potential that fire suppression actions have exposed previously unreported cultural resources.

Ground inspections are recommended to document the locations and appearance of (or, lack thereof) of previously unrecorded historic sites and artifacts.

IV. RECOMMENDATIONS

A. Emergency Stabilization – Fire Suppression Repair

It is recommended that fire lines and other areas where activities associated with fire suppression be surveyed for the presence of previously unreported sites. If any 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 Bobcat Fire:

- #1. Conduct cultural resources compliance prior to implementation of any emergency stabilization treatments

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 Bobcat 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 Jorie Clark initiated contact with the Washington State Historic Preservation Office via e-mail on August 16, 2007 that Section 106 NHPA procedures will be followed for any treatments that may affect cultural resources.

Confederated Tribes of the Umatilla Indian Reservation - Archaeologist Jorie Clark initiated contact on August 16, 2007.

Yakama Indian Nation – Archaeologist Jorie Clark initiated contact on August 16, 2007.

Confederated Tribes of the Colville Indian Reservation – Archaeologist Jorie Clark initiated contact on August 16, 2007.

Nez Perce Tribe – Archaeologist Jorie Clark initiated contact on August 16, 2007.

Wanapum Tribe – Archaeologist Jorie Clark initiated contact on August 16, 2007.

VI. REFERENCES

Daugherty, R.D.

1952 Archaeological investigations in O'Sullivan Reservoir, Grant County, WA. *American Antiquity* 17:374-383.

Greene, G.S. and Irwin, T.T.

1973 An Archaeological Survey of Lower Crab Creek. Unpublished manuscript. Laboratory of Anthropology, Washington State University, Pullman. Report on file at the Cultural Resource Team Office, U.S. Fish and Wildlife Service, Sherwood, OR.

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.

**BURNED AREA EMERGENCY STABILIZATION PLAN
BOBCAT FIRE
VEGETATION RESOURCE ASSESSMENT**

I. OBJECTIVES

- Evaluate and assess fire and suppression impacts to vegetation resources and identify values at risk associated with vegetation losses.
- Determine emergency stabilization and monitoring needs supported by specifications to aid in vegetation recovery and soil stabilization.
- Evaluate the potential for invasive species encroachment into native plant communities within the fire area.
- Provide management recommendations to assist in vegetation recovery, watershed stabilization, site productivity and species habitat protection.

II. ISSUES

- Protection and enhancement of other resource values including site productivity, wildlife habitat, vegetation resources, cultural resources and watershed stability.
- Management strategies which provide for the stabilization, natural regeneration and recovery of impacted areas.
- Immediate stabilization of denuded (i.e. vegetation has been removed) soils that may impact ecological function
- 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

This report identifies and addresses known and potential impacts to vegetation resources within the Bobcat Fire area on the Columbia National Wildlife Refuge (Refuge). The Fire started on July 13, 2007 and burned 1,900 acres of contiguous area of which 514 was on federal land. The vegetation resources are described as upland Columbia Basin shrub-steppe plant communities. Findings and recommendations contained within this assessment are based upon field reconnaissance of the Fire area, interviews with local resource specialists, local land managers, and review of relevant documents.

This vegetation assessment will refer to plants in communities and also in associations. A plant community is an assembly of different species of plants

growing together in a particular habitat and plant associations are a distinctive community of plants that have ecologically similar requirements.

Vegetation occurring prior to the Bobcat Fire consisted of the big sagebrush (*Artemisia tridentata*) community, elements of which include Sandberg's bluegrass (*Poa sandbergii*), bluebunch wheatgrass (*Pseudoroegneria spicata*), Idaho fescue (*Festuca idahoensis*), greasewood (*Sarcobatus vermiculatus*), saltgrass (*Distichlis stricta*), rabbitbrush (*Chrysothamnus spp.*), and yarrow (*Achillea millefolium*). The Bobcat Fire left very few mature or immature big sage brush plants for future seed regeneration. Predominant over the naïve species in some areas was cheatgrass, a non-native annual that contributed to the fire's rapid spread and high fire intensity through its dense growth habit.

Much of the vegetative resources that were extensively impacted on federal land by this Fire are considered high-quality or sensitive vegetation suitable for wildlife forage and when intact, offers quality soil stabilization. Findings and recommendations contained within this vegetation 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 and Results

Ground reconnaissance was conducted on July 14, and August 1, 2007 by U.S. Fish and Wildlife Service (USFWS) staff member Randy Hill and on September 6, 2007 by First Strike/Shaw Environmental BAER Team Members accompanied by Mr. Hill. Photographs were taken on July 14, August 1, and September 6 which are in the photo documentation section of this plan (Appendix IV).

Plant associations were inspected to determine losses, requirements for stabilization efforts, and recovery potentials. Observations were made of fire impacts to duff layers and live crown tissue on grass and shrub species. Direct fire impacts have been documented for all plant communities, based upon consultation with local staff, and after reviewing the burned areas within the Fire perimeter through visual assessment, photos, and map documentation.

C. Findings

1. Vegetation:

The big sagebrush/bluebunch wheatgrass association is characterized by four layers of vegetation: an overstory layer composed mostly of big sagebrush up to two meters tall, a tall understory layer of bluebunch wheatgrass, a short understory dominated by Sandberg's bluegrass, some remnant Idaho fescue and a layer of algae, liverworts, lichens, mosses, and bacteria on the soil surface (i.e., the

microbiotic crust). The microbiotic crust is a critical component of native grasslands and shrub-steppe communities. This diminutive biologic community stabilizes the soils and fills the interstitial space between bunchgrass clumps. Perennial forbs are a minor constituent of the tall understory layer, whereas most annual forbs occur in the short understory layer. Other shrubs that may be present include rabbitbrush and black greasewood. Additional plants include yarrow and Thurber's needlegrass (*Achnatherum thurberianum*).

Plant associations within the Bobcat Fire include big sagebrush/bluebunch wheatgrass/Sandler's bluegrass/cheatgrass, black greasewood/saltgrass and abandoned agricultural fields dominated by forbs and annual grass communities. Topography, aspect, and elevation dictate the variability of the vegetative communities within the Fire area as well as the soil textures and depths of rooting capability.

The Bobcat Fire burned approximately 1,900 acres, of which 514 acres were on Refuge lands.

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

Big sagebrush/Sandberg's bluegrass/Bluebunch wheatgrass: Sagebrush is the dominant shrub, although rabbit brush occurs at varying levels, as well as greasewood, in the low lying areas. Sandberg's bluegrass, mixed with bluebunch wheatgrass dominates the understory.

Big sagebrush/Sandberg's bluegrass/Bluebunch wheatgrass/Cheatgrass: Sagebrush is the dominant shrub, although rabbitbrush occurs at varying levels as well as greasewood in the low lying areas. Sandberg's Bluegrass mixed with bluebunch wheatgrass dominates the understory, interspersed with varying levels of cheatgrass. While they often commingle, Sandberg's Bluegrass and cheatgrass are frequently ecologically-separated on a fine scale (Easterly, R. and D. Salstrom 2004.), with Sandberg's bluegrass dominant over cheatgrass in the slightly-depressed intershrub areas and other areas with specific microclimates with slightly-higher moisture (e.g., in specific micro-topographic areas).

Black greasewood/salt grass: This plant community is composed of greasewood and salt grass and can be found in the low-lying areas that retain moisture; these areas are too moist for the big sage community.

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.

Vegetation within this area has also been altered through the establishment of cheatgrass within sage communities and the shortening of the natural fire return interval. Pre-neo Human contact, fire return intervals were between 50 and 100 years in the shrub-steppe region. Fires burned in a mosaic fashion across the landscape, leaving many healthy remnant stands of bunchgrass and sage. The mosaic fire patterns allowed for the survival of healthy sage communities and habitat for wildlife species. The shortened fire return interval has created impacts from repeated burning.

2. Rare Plants

After reviewing documentation from previous fires and interviews with FWS staff members it is clear that there is no concrete documentation of rare plant species within the boundaries of the Bobcat Fire. For this reason, the current USFWS species list for Adams County was consulted. A Species list was obtained using the following web-based address: <http://www.fws.gov/easternwashington/county%20species%20lists.htm>.

<u>SPECIES</u>	<u>LISTING STATUS</u>
Ute ladies' tresses (<i>Spiranthes diluvialis</i>)	T
Washington polemonium (<i>Polemonium pectinatum</i>)	FSC

KEY TO LISTING STATUS:

T FEDERAL THREATENED
 FSC FEDERAL SPECIES OF CONCERN

The above listed species were identified as occurring, or having habitat within Adams County. However, through post fire reconnaissance and consultation with local experts, it was determined that these species were 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.

3. Vegetation/Structural Impacts

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

- a) Potential for invasion by aggressive non-native species throughout the disturbed site.
- b) Impacts to native shrub and grass species during suppression and mop-up activities.

- c) 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.
- d) Loss of the organic litter layer on approximately 95 percent of the Fire area.

Fire effects varied and intensity ranging from medium to high. This Fire demonstrated extreme fire intensity on 95-100 percent of the shrub-steppe community because of gusting and fire generated convective winds. Increased residence time (i.e. the time that fuel particle remains flaming) was likely responsible for complete combustion of shrubs and the lack of shrub “skeletons” or stumps leaving only white ash to indicating very hot and complete burn specifically around the area south of Hutchinson and Shiner Lakes. A high mortality rate is expected of the remaining sagebrush within the Fire margin by heat scorch because of the plants sensitivity to fire. Additionally noted is that sagebrush does not tolerate fire and only re-sprouts from seed. Shrubs that had persisted at the base of cliffs and rock outcrops were mostly consumed. Sandberg’s bluegrass was widespread, but most areas were dominated by cheatgrass due to grazing history and past fires. (Hill 2007) (Please see Appendix IV, Photo Documentation.)

Most sagebrush, bunchgrass, and cheatgrass communities experienced 95 to 100 percent vegetation loss of above-ground cover or vegetative resources within the Fire boundary. The Bobcat Fire Shrub-Steppe community of the Bobcat Fire was fully intact and representative of a healthy ecosystem.

Shrub at the base of cliffs and rock outcrops were mostly consumed. Sandberg’s bluegrass was widespread, but many areas were dominated by cheatgrass due to grazing history and past fire. These areas burned hot and completely with 95 to 100 percent burn. Shrubs generally burned to the ground except where highly alkaline soils were dominated by salt grass and greasewood in depressions close to Hutchinson and Shiner Lakes, and where isolated greasewood had little fuel understory. White ash indicating very hot and complete combustion was the norm in areas in the northwest corner, and even areas where bluegrass and a biotic crust dominated lithosols there was complete thorough burn. Other than cheatgrass, other invasive species noted except in the south area where Russian knapweed is widely scattered across the landscape. Introduction of alien species is a concern where so much exposed area is now open to complete invasion by noxious weeds and invasive plants.

Fire Severity	Percent Affected
Low	5%
Medium	25-45%
High	50-70%

The role of microbiotic crusts (MBC) in shrub-steppe ecosystems is still incompletely understood (Evans and Lih 2005:106) and estimating the magnitude and extent of MBC damage from the Bobcat Fire is a complex task that is beyond the scope of BAER field survey and assessment. Therefore, this assessment can make no definitive conclusions about the areawide condition and location of the MBC and the emergency stabilization measures recommended reflect this finding.

Negative impacts resulting from vegetation losses include a reduction in wildlife habitat, forage for wildlife species, visual quality degradation, increased non-native species invasion, bare 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 Refuge property resulted from the engines driving off road during suppression efforts. A complete inventory was conducted of ground disturbance on the fire area and emergency stabilization needs assessed (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, aggressive annual/biennial species such as Russian thistle, and Russian knapweed. 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.

Plant	Expected Regeneration Percent
Sage	0-2 %
Bunchgrass	40%
Cheatgrass	>90%

Breakdown of Area	Percent Affected
Total percent burned	95-98%
Total area affected by wind erosion	45-50%
Total percent vegetation affected	95-100%

Breakdown of Major Plants	Percent Affected
Sage	95-100%
Bunchgrass	95-100%
Cheatgrass	95-100%

1. Noxious Weed Establishment

Invasive non-native plant species pose one of the most serious threats to the native biodiversity, wildlife habitat, and scenic values of the Refuge. At the Refuge, and elsewhere in western North America, invasive and noxious non-native 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, creating 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 of native vegetation are likely become established and/or spread within the burned area.

Control of weed species known on the Refuge 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.

Species	Priority for control
Downy Brome (<i>Bromus tectorum</i>)	1
Russian knapweed (<i>Centaurea diffusa</i>)	1
Rush skeletonweed (<i>Chondrilla juncea</i>)	1
Puncturevine (<i>Tribulus terrestris</i>)	1
Russian knapweed (<i>Acroptilon repens</i>)	2
Canada thistle (<i>Centaurea solstitialis</i>)	2
Kochia (<i>Kochia scoparia</i>)	3

Perennial pepperweed (<i>Lepidium latifolium</i>)	3
Common reed (<i>Phragmites australis</i>)	3

All of the above non-native plants and noxious weeds spread vigorously, and are a threat to the burned area. Each of these species is currently located along existing road systems and/or in areas within or near the Fire. It is imperative to treat known populations prior to seed-set to reduce the expansion potentials of these populations into the Fire area. Immediate treatment of these populations is recommended.

The Fire area presents a disturbance, and has created new open sites for weed invasion. Coupled with the added nutrients from the ash, a fertile bed for the rapid colonization and spread of non-native species has been created. Upon the discovery of new noxious weed populations, accurate population information should be collected through the use of Global Positioning Systems (GPS) to determine infestation size, original source, and potential control methods. Control efforts will be implemented in accordance with the Invasive Species Management Plan guidelines and protocols.

The area of the Fire may have further populations of noxious weeds that are currently un-documented. Immediate surveys of the area are important to document any previously unknown infestations.

The U.S. Fish and Wildlife Service uses an Integrated Pest Management (IPM) approach to treat targeted invasive plant species on the Refuge. Manual, mechanical, biological, cultural (e.g., prescribed fire and competitive plantings), and chemical treatment methods will be used within the Fire area to achieve prioritized weed control objectives. Invasive species managers will draw upon the full range of appropriate control technologies to develop integrated treatment plans for target species at selected priority sites. Treatment methodologies will be based upon the best information available from weed management literature and professional experience, tailored to the characteristics of the particular species and site.

2. Revegetation

Concern has been expressed over the loss of vegetation cover within the Bobcat Fire area. Stabilization and re-vegetation of those areas is needed to ensure ecological function. Revegetation in the area should be conducted in order to protect soils in the area reducing the erosional affects that wind and water can generate.

The former big sagebrush community is unlikely to develop quickly and sage in general does not re-sprout from roots, but must be reseeded. Sagebrush is not fire-tolerant and relies on wind-blown seeds from outside the burned area for re-

establishment. (Wikipedia) When questioned, U.S. Fish and Wildlife Service staff member, Randy Hill, noted that sagebrush seeds spread only 100 ft from origin. Natural seeding for the return of big sage is especially limited because 90 to 100 percent of the available plants have been impacted by the Bobcat Fire. It is advised that supplemental reseeding should be implemented at some point. Within the burn area 40 percent of the bunchgrass is predicted to re-sprout without further action. After investigation of the scorched root crown and digging up the root systems it is highly unlikely that the remaining 60 percent of the bunchgrass will regenerate specifically around the area south of Hutchinson and Shiner Lakes. With the high probability of cheatgrass invasion into these areas, an immediate treatment plan must be formed. In addition, other exotics such as Russian thistle and Russian knapweed are already establishing themselves.

Although cheatgrass has limited benefits as green browse for wintering Canada geese, it is not as valuable or biologically-diverse a community as that of the big sage community. Because cheatgrass has the ability to establish itself earlier in the season than native species (it germinates at low temperatures to take advantage of late fall or early spring moisture), it is very effective at becoming the predominant vegetation of a burned area. Native species have difficulty in re-establishing once cheatgrass is established. The resulting monoculture weakens the natural biotic diversity of the native community. An herbicide spray of Plateau[®] should be used to control the spread of cheatgrass.

To promote the maintenance and reestablishment of the native communities and prevent the establishment of undesirable exotics, a reseeding program of native shrubs and grasses is essential. Seeding should ideally occur in the fall (just before snowfall, if possible), taking advantage of cool season precipitation for early spring germination. Because there is cheatgrass seed available on both burned and upwind areas, fall restoration seeding is imperative to prevent cheatgrass spread. Only seed certified as weed-free would be purchased to further protect against the spread of undesirable exotic species.

Invasive broadleaf species (especially knapweeds) must be controlled, especially along tracks and roads used during the suppression effort. Where soil disturbance created openings in the cryptogam layer that normally holds the soil and protects the interspaces between plants, spot spraying of Escort[®], Telar[®], or 2,4-D and Banvel[®] is necessary to prevent the spread of these species in the burned area.

The rehabilitation plan for the Bobcat Fire should be in accordance with the Refuge's land use and management objectives: to preserve, restore, and enhance natural ecosystems, to preserve the natural diversity of fauna and flora, and to provide visitors with a recreational experience oriented toward wildlife. (USFWS 1997)

Application of herbicide and planting of native seeds (including aerial seeding) to restore areas before invasive species become established is well supported by

recent research (Bakker & Wilson, 2004:1058-1064) (Huddleston & Young 2005:507-515) (Thompson & Rounding, 2006) (Seabloom & Harpole 2003).

Evans and Lih (2005) findings/conclusions support the recommended Bobcat Fire ES measures over natural recovery:

--Careful management... and a long term commitment to integrated and adaptive approaches to invasive species management, fire management and restoration practices will be required to successfully manage the ALE Reserve and other shrub-steppe ecosystems in the coming years.

--Aggressive management activity to control cheatgrass and to enhance the recovery of natural structure and function of sagebrush shrubland stands will be critical to the long-term ecological integrity of these habitats.

--The problem of cheatgrass must be addressed in relation to native plant community health and fire management practices. There are no simple answers; no permanent solution to the problem of cheatgrass control is currently available and management is extremely challenging.

--The rates of grass seedling emergence and recruitment from aerial seeding efforts observed in the study are probably typical of broadcast seeding efforts in the arid West. (*This infers that aerial seeding is a typical broadcast seeding practice in similar areas of the Western U.S.*)

IV. RECOMMENDATIONS

A. Fire Suppression Stabilization:

Suppression account – Dozer/Disk line Rehabilitation: Drill-seed or hand seed all disturbed areas which resulted from suppression actions with native species to protect the ecological integrity of the area. Seeding and planting will be postponed until fall 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 Bobcat Fire:

Stabilize soil to prevent loss or degradation of productivity by seeding to prevent establishment of invasive plants; and by using integrated pest management techniques to minimize the establishment of non-native invasive species within the burned area.

- 1) *Non-Native Invasive Species Control: Pesticide Spray Followed With Native Plant seeding-* Apply pesticide spray to significantly reduce invasive weed spread and diminish threats in areas of concern from noxious weeds and non-

native species. Spray should not be applied during high wind storms. Follow the spray with aerial and drill seeding of native plants mix and in the fall or spring to establish prolific native colonies and minimize invasive weed infestation into non-infested areas. Seeding methods should follow weather patterns to determine times of appropriate seeding considering expected moisture and wind.

- 2) *Effectiveness Monitoring*: Monitor non-native invasive species growth and native plant seedlings in first year following treatment to determine success of revegetation efforts and to determine if additional treatments are required to protect and maintain the ecological integrity of the site.

C. Management Recommendations (non-specification related)

- 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)

- *Monitoring: Invasive Plant Species-* Develop monitoring protocols and conduct field inventories on disturbed sites including but not limited to dozer lines, hand lines, safety zones, and initiate control measures on invasive species infestations that threaten native plant community recovery as discovered.

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**BURNED AREA EMERGENCY STABILIZATION PLAN
BOBCAT FIRE
WILDLIFE RESOURCE ASSESSMENT**

I. OBJECTIVES

- Assess effects of the Bobcat Fire and suppression actions to 1) Federal species with special status [species listed as endangered, threatened, proposed, candidates or species of concern under the Endangered Species Act (ESA)]; 2) State species of concern [(species listed as endangered, threatened, sensitive or candidates by the Washington Department of Fish and Wildlife (WDFW)]; and 3) species of Tribal Importance. This assessment covers birds, mammals, amphibians, reptiles, fish, insects and their habitat.
- Initiate Emergency Section 7 Consultation with the US Fish and Wildlife Service (USFWS) and NOAA's National Marine Fisheries Service (NMFS) if required by the ESA.
- Assess effects of fire and suppression action to habitat improvements.
- Assess effects of proposed emergency stabilization actions to listed species and habitat.

II. ISSUES

- 7 agency-listed (State and/or Federal) wildlife species occur within or near the fire area.
- Potential effects to these species from the fire, suppression actions and potential post-fire effects.
- Potential effects to these species from proposed emergency stabilization actions.

III. OBSERVATIONS

A. Background

The purpose of this Burn Area Emergency Stabilization (ES) Wildlife Assessment is to document the effects of the fire, suppression actions, proposed emergency stabilization work, and potential post-fire erosion, to all Federally-listed, State-listed, agency-sensitive, and culturally-important species and their habitats which may be affected by the fire. This assessment also includes documentation of Emergency Section 7 Consultation, if required by the ESA, with USFWS and NMFS. The species list for the fire area was developed by Randy Hill and Howard Browsers, Wildlife Biologists, USFWS, Mid-Columbia National Wildlife Refuge Complex. Species occurrence discussed in this assessment is based on formal surveys and habitat inventories conducted prior to the Bobcat 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

Complex office.

The Columbia National Wildlife Refuge (Refuge) is located in the Pacific Flyway. Habitats within the fire area serve as resting, feeding, and nesting areas for many migratory bird species in addition to many resident species of wildlife and invertebrates.

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 USFWS, personal communication with agency biologists (listed at end of report), and reconnaissance of the fire area on August 1 and September 5, 2007. Habitat information and mapping for the various species is based on agency records and post-fire reconnaissance. Reconnaissance and analysis included 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 Bobcat Fire ES Vegetation and Soils Resource Assessments. These reports contain more detailed descriptions of pre-fire vegetation, post-fire vegetative recovery estimates, and effects to the watersheds. Representative photos taken of burned areas during post-fire reconnaissance are located in the appendix.

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 wildlife species without special Federal or State status 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 Bobcat 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, the assessment includes information at a larger scale, across land ownership boundaries for species which may require assessment for long-term rehabilitation and restoration (USFWS 2000).

BIOLOGICAL EVALUATION

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

The community of plants and animals found in this area represents one of the remaining examples of the shrub-steppe ecosystems that once covered the Columbia River Basin (USFWS 2000). The Refuge contains rare, rich and diverse shrub-steppe ecosystem flora and fauna that have been lost elsewhere due to habitat conversion, fragmentation and application of pesticides. This area serves a critical role in contributing to the local, regional, national and international ecological integrity of the shrub-steppe ecosystem (USFWS 2000).

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 from socio-political and economic factors (USFWS 2000). Coupled with the arrival of invasive species and noxious weeds, these mechanisms have slowed or prevented the natural recovery processes of the shrub-steppe ecosystem from disturbance events such as fire. Managing for biological integrity in this area necessitates that actions be taken to mitigate the ecological effects of increasing fire frequency and intensity, and invasion of exotic species (USFWS 2000).

The Bobcat Fire completely consumed above-ground vegetation on approximately 95% of upland areas. Notably, the fire destroyed approximately 514 acres of big sagebrush shrub and steppe habitat. Sagebrush is a food source and/or provides nesting, resting, thermal, and escape cover for a wide variety of species. Sagebrush also provides a thick canopy which protects understory vegetation which in turn can be a valuable food source for wildlife. Wildlife species in the area of the Bobcat Fire that are dependent on shrub-steppe and have Federal or State listing status include: Washington ground squirrel, ferruginous hawk, loggerhead shrike, black-tailed jackrabbit, and striped whipsnake.

Wildlife Species of Concern:

Bobcat Fire Species List

On August 8, 2007, a current species list for Adams County, which encompasses the Bobcat Fire, was obtained from the U.S. Fish and Wildlife Service's Upper Columbia River Fish and Wildlife Office, Spokane at the following web address: <http://www.fws.gov/easternwashington/documents/Grant%20Cty%208-8-07.pdf>.

Federal agencies are also charged with managing for species of importance to the Native American Tribes. From this broad inventory, a list of species more specific to the Bobcat Fire area and adjacent lands was obtained through consultation on September 5, 2007 with Randy Hill and Howard Browers of the USFWS.

The following species list summarizes all wildlife species under the jurisdiction of the Refuge that are known to occur or have the potential to occur in the fire area during at least portions of the year. For plant species of concern that may occur in Adams County, see the Vegetation Assessment.

<u>SPECIES</u>	<u>LISTING STATUS</u>
Bald eagle (<i>Haliaeetus leucocephalus</i>)	FM/ST

Washington ground squirrel (<i>Spermophilus washingtoni</i>)	C/SC
Ferruginous hawk (<i>Buteo regalis</i>)	FSC/ST
Loggerhead shrike (<i>Lanius ludovicianus</i>)	FSC/SC
Striped whipsnake (<i>Masticophis taeniatus</i>)	SC
Black-tailed jackrabbit (<i>Lepus californicus</i>)	SC
Mule deer (<i>Odocoileus hemionus</i>)	TI

The following listed species were identified as occurring, or having habitat within Adams County. Through post-fire reconnaissance and consultation with local experts, it was determined that these species were 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, and/or the fire is outside of the species range or season of use.

Pygmy rabbit (<i>Brachylagus idahoensis</i>) Columbia Basin distinct population segment	E/SE
Burrowing owl (<i>Athene cunicularia</i>)	FSC/SC
Northern leopard frog (<i>Rana pipiens</i>)	FSC/SE
Long-eared myotis, (<i>Myotis evotis</i>)	FSC
Pallid Townsend's big-eared bat (<i>Corynorhinus townsendii pallenscens</i>)	FSC
Sagebrush lizard (<i>Scleropus graciosus</i>)	FSC/SC

KEY TO LISTING STATUS:

FLE	FEDERAL LISTED ENDANGERED
FLT	FEDERAL LISTED THREATENED
FC	FEDERAL CANDIDATE
FSC	FEDERAL SPECIES OF CONCERN
FM	FEDERAL MONITOR
SC	STATE CANDIDATE
SE	STATE ENDANGERED
ST	STATE THREATENED
SS	STATE SENSITIVE
TI	TRIBAL IMPORTANCE

Bald Eagle

As of August 8, 2007, the bald eagle was officially removed for the endangered species list and is now a Federal monitor species. Bald eagles will continue to be monitored and protected under the Bald and Golden Eagle Protection Act. The State considers bald eagle a threatened species. Bald eagles do not nest anywhere on The Refuge or the local vicinity. Bald eagles do inhabit The Refuge from fall through spring, becoming very common during the winter months. Hutchinson and Shiner Lakes and associated riparian zones provide over wintering habitat for waterfowl, which also winter on The Refuge. Large concentrations of

waterfowl wintering on The Refuge provide a predictable forage base for wintering eagles.

Fire Impacts

The Bobcat Fire had no effect on bald eagles either directly or indirectly. Cover and foraging habitat along Hutchinson and Shiner lakes were not eliminated by the fire, so suitable waterfowl wintering areas still exist. Therefore, potential forage for bald eagle was not eliminated by the fire.

Washington Ground Squirrel

The Washington ground squirrel is a Federal and State candidate for listing. This area is potential habitat for Washington ground squirrels, however, it is not known if this habitat was occupied. 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 (USFWS 2007). It prefers sandy soils in dry, open, sagebrush and grassland habitats. This species hibernates 7 to 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. The removal of shrub cover due to the fire represents a significant decrease of suitable habitat for this species. This habitat loss may delay or prohibit recovery of the Washington ground squirrel in Washington (USFWS 2007).

Fire Impacts

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 (cheatgrass, *Bromus tectorum*) will impact the habitat for Washington ground squirrels (USFWS 2007). Habitat degradation of rangelands and shrub-steppe areas is recognized as a major cause of decline in this species (Yensen and Sherman 2003). Stabilization of the area is important to maintain the potential for the area to eventually support Washington ground squirrels.

Ferruginous Hawk

Ferruginous hawks are a Federal species of concern, a Federal Migratory bird of Conservation Concern (USFWS 2002) and a State-threatened species. There are no known ferruginous hawk nests within the Bobcat Fire burn area. The closest nest is located approximately 3 miles north of the Bobcat Fire. The burn area, however, is within the foraging area for active nesting territories.

Ferruginous hawks are migratory raptors that occur on The Refuge during the breeding season from early March through August (USFWS 2000). The incubation period is 28 to 33 days with fledging at 44 to 48 days from the date the egg is laid. 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 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 514 acres of the Bobcat Fire can be considered ferruginous hawk habitat. Impacts to ferruginous hawks from the Bobcat Fire and suppression activity are indirect and include a reduction of habitat diversity that supports prey for ferruginous hawks and decrease of habitat for foraging. The WDFW considers the ferruginous hawk a Priority Species for management and recognizes that the species benefits 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, to promote habitat stability and to benefit ferruginous hawk prey populations, WDFW recommends reseeding of native plant species after chaining or burning (Richardson et al. 2004, Olendorff 1993). Therefore, stabilization of foraging habitat lost in the Bobcat Fire is essential. Stable foraging habitat within nesting territories that supports an abundance of prey species for the ferruginous hawk is likely critical for the recovery of this species in Washington

Loggerhead Shrike

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. The Loggerhead shrike is a neo-tropical migrant species that breeds on the Refuge. There are documented sightings of shrike in the fire area during the breeding season. Furthermore, based on habitat prior to the fire and given that this area has not been systematically surveyed for shrikes, it is likely that there were additional breeding territories in the fire area.

Loggerhead shrikes are common on the Refuge from early March until the end of August (USFWS 2000). 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 and 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 and 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. Studies to the south on the Hanford Reach National Monument (Poole 1992) found that shrikes defended territories averaging 34.4 acres (± 4.9 ac). Also on the Hanford Site, of 113 territories studied, 96 percent were reoccupied the following season (Poole 1992). Shrikes remain in breeding territories as fledglings for 3 to 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 Bobcat 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 Washington Breeding Bird Survey data for the Columbia River Basin show 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

Impacts from the Bobcat Fire to shrikes are both direct and indirect and include loss of 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. The 514 acres of shrub-steppe habitat that was burned in the Bobcat Fire can be considered habitat for loggerhead shrike. Adults that were present during the fire, however, are mobile enough to escape harm from the fire and suppression measures. Unburned big sagebrush is adjacent to burned areas, so flushed adults could have found cover in these areas. If weak-flying fledglings were present, they may have been consumed by the fire. 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 adjacent big sagebrush may increase inter- and intraspecific competition for nesting territories. If suitable habitat areas are 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.

Habitat lost in the Bobcat Fire is combined with cumulative losses due to repeated fires on the Refuge.

WDFW 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 of the habitat within the fire area is critical for Refuge management of this declining species.

Striped Whipsnake

The striped whipsnake is a State candidate species. 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 its range in Washington. Striped whipsnakes have been documented in Washington only 26 times. In the last decade, only 3 observations have been reported (USFWS 2007). This species occurs in low-elevation (less than 1,985 feet) arid regions with scattered vegetation and open rocky areas (USFWS 2007). They require shrubs for cover and rock crevices or rodent burrows for egg laying and hibernation (Nordstrom and Whalen 1997). Rodent burrows in sagebrush or near tallus slopes, canyons or ravines are considered optimal striped whipsnake habitat (Nordstrom and Whalen 1997). Prey species are primarily lizards, but may include rodents, bats, frogs, birds, and other snakes. Mating occurs in the spring, and eggs are laid in June, and hatched in the late summer or early fall. Areas of Adams County where they are known to occur have relatively undisturbed shrub-steppe habitat with a low cover of cheatgrass. (Washington Department of Natural Resources at web page: <http://www.dnr.wa.gov/nhp/refdesk/herp/speciesmain.html>)

Fire Impacts

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 may have exposed nest sites to hazardous conditions and predators and/or destroyed nest sites. Given the rarity of the species, indirect impacts related to habitat loss and decreased prey abundance are more likely. The entire 514 acres of shrub-steppe habitat that burned during the Bobcat Fire is potential striped whipsnake habitat. Rodent burrows, canyons, and tallus slopes, which serve important functions in the life history of whipsnakes, are present within the burn area. Habitat for prey within the fire area was greatly reduced. Therefore, prey species may be less available for the striped whipsnake until habitat recovers and is repopulated by various prey species. Invasion of cheatgrass into the fire area will reduce the likelihood that this area would recover into habitat that could support striped whipsnakes.

Black-tailed Jackrabbit

Black-tailed jackrabbit is a State candidate species. Given its size and mobility, all of the 514 acres of the Bobcat Fire are potential black-tailed jackrabbit habitat. However, black-tailed jackrabbit sightings within the burn area are very rare (1 sighting since 1995).

The black-tailed jackrabbit was once abundant throughout the Columbia Basin (USFWS 2000). 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 vegetative structure for breeding sites and hiding cover, and require sagebrush 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 trending 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, and fire) and has limited the re-colonization of areas that could potentially support jackrabbit populations (USFWS 2000).

Fire Impacts

No direct impacts to the black-tailed jackrabbit resulted from the fire. Black-tailed jackrabbits are relatively fast moving animals. Because these animals are highly mobile, it is anticipated that adults would have been swift enough to avoid the fire and suppression activity. If present, recently birthed young, however, were likely consumed in the fire as they would not have been able to flee. Some indirect impact occurred due to loss of native foraging habitat and cover. Due to this indirect impact from the fire, jackrabbits will be more vulnerable to predation if forced to seek forage or cover in other areas. When combined with cumulative losses due to repeated fires on the Refuge, the habitat lost due to the Bobcat Fire represents a notable impact to black-tailed jackrabbit habitats, and may negatively affect their continued persistence within the Refuge. Habitat stabilization to prevent cheatgrass infestation and encourage native shrub and grass re-colonization within the burn area is critical to maintaining viable black-tailed jackrabbit habitat on The Refuge.

Mule Deer

Mule deer is a species of Tribal importance. Mule deer are a common resident ungulate on the Refuge. Mule deer are primarily browsers and rely on riparian vegetation and bitterbrush for food (USFWS 2000). Mule deer also seek cover in

riparian areas along Hutchinson and Shiner lakes.

Fire Impacts

Mule deer were not likely directly impacted by the Bobcat Fire or fire suppression. Mule deer are highly mobile animals, and it is anticipated that they were able to move out of the affected area during the fire. Although no mule deer fawn mortality was observed during post-fire reconnaissance, recently born fawns may not have been able to avoid the fire. Indirect impacts include loss of habitat. The entire burn area (514 acres) is potential mule deer habitat, with riparian habitat being especially important for Mule deer. The greatest impact to mule deer from fire is loss of available forage (USFWS 2000). Regrowth of grasses in upland areas is not anticipated until fall rains begin, possibly in November. Regrowth of shrub species is expected to be minimal due to high fire residence times and the cumulative impacts to species richness/seed banks by past fires. Overbrowsing in other areas is likely to occur. Additionally, deer may also experience some nutritional stress due to the fire. Lactating females may be at the greatest risk of this type of stress because of the energy demands that lactation produces (USFWS 2000).

IV. RECOMMENDATIONS

A. Fire Suppression:

Determinations of effect: The fire and suppression actions had no directly attributable effect to Federally-listed species. Furthermore, proposed emergency stabilization will have no effect on Federally-listed species. Therefore, there is no need for emergency ESA Section 7 Consultation for Bobcat Fire stabilization. Indirect impacts, however, due to loss of habitat occurred to several Federal species of concern and State-sensitive species. Stabilization treatments will mitigate habitat damages by minimizing invasion of non-native vegetation onto burned areas and encouraging re-colonization by native grasses and shrubs. These treatments will actually benefit listed species.

B. Emergency Stabilization:

Allowable Actions: Stabilize soil to prevent loss or degradation of productivity by seeding to prevent establishment of invasive plants; and by using integrated pest management techniques to minimize the establishment of non-native invasive species within the burned area.

Recommendations with Specifications:

- #1 – Non-native invasive species control – Integrated Pest Management. Use integrated pest management (IPM) techniques (herbicides, biological, mechanical, and cultural control methods) as appropriate to prevent the spread

and establishment of non-native weeds within the fire area. 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 vegetation recovery that will eventually result in viable habitat conditions for all of the listed species addressed above. IPM methods will be timed to occur when listed species are absent or least likely to occur on or adjacent to lands receiving the treatment.

- #2 –Non-native invasive species control – native seedings. 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 vegetation recovery that will eventually result in viable habitat conditions for the shrub-steppe-dependent listed species addressed previously. Seeding will be timed to occur when listed species are absent or least likely to occur on or adjacent to lands receiving the treatment.

C. Management recommendations (Non-Specification Related):

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

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**BURNED AREA EMERGENCY STABILIZATION PLAN
BOBCAT 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.
- Coordinate with local agencies so that 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.
- Soil disturbance on highly erodible soils from fire suppression activities.

III. OBSERVATIONS

A. Background

Please refer to fire history summary.

B. Reconnaissance Methodology and Results

On July 18, 2007, refuge staff began evaluating resource impacts caused by the suppression effort on lands and physical improvements with the Bobcat Fire area. Information was obtained from suppression forces, the Columbia NWR manager, and the refuge biologist.

C. Findings

The Bobcat Fire burned approximately 514 acres on Columbia National Wildlife Refuge (Refuge).

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. A complete cultural resource assessment will be completed on all suppression lines within the fire (refer to Cultural Resources Assessment).

There are several types of suppression impacts to be considered:

West Othello Spur Road (10055057) – This was a dirt two-track, non-public road that has been pounded into deep ruts of very fine powder by fire trucks. A total of 0.7 miles is now impassable to even 4-wheel drive vehicles. Repairs would include initial grading, compaction, and graveling to prevent erosion and restore usability for two-wheel drive pickups.

Bobcat Trail Road (10055025) – This was a dirt two-track, non-public road that has been pounded into deep ruts of very fine powder by fire trucks. A total of 2.8 miles is now impassable to even 4-wheel drive vehicles. Repairs would include initial grading, compaction, and graveling to prevent erosion and restore usability for two-wheel drive pickups.

Coyote Lake Road (10003245) – This was a slightly graveled two-track, non-public road that now has scattered sections of “blowout” in which there is no more gravel and has been pounded into deep ruts of very fine powder by fire trucks. Approximately 15 patches 20 feet long need to be repaired. Repairs would include initial grading, compaction, and graveling to prevent erosion and restore usability for two-wheel drive pickups.

Vehicle Damages to Habitat – At the east end (boundary line) of West Othello Spur Road, the responding fire and electric company vehicles used the area as a staging area and the excessive driving on the grasslands has exposed the bare soils. The area needs immediate stabilization to prevent wind and water erosion. Approximately 600 square yards of area damaged.

Vehicle Damages to Habitat – At the west end of Bobcat Trail Road and along significant portions of Bobcat Trail Road, the responding fire vehicles drove off the severely rutted and impassible roads to bypass these areas and resulted in damaging the grassland habitat, exposing the bare soils. Similarly, additional areas of grasslands where no road existed were driven on more than one time and also exposed the bare soils. The areas need immediate stabilization to prevent wind and water erosion. Approximately 1 mile of “new road” damage and ½ mile of road “shoulder” driving damages by 10 feet wide totaling 5,900 square yards of area damaged.

IV. RECOMMENDATIONS

A. 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

Regional Office Archaeologist, FWS
Rick Poetter, Refuge Manager
Randy Hill, Wildlife Biologist

**BURNED AREA EMERGENCY STABILIZATION PLAN
BOBCAT FIRE
WATERSHED AND SOIL DAMAGE ASSESSMENT**

I. OBJECTIVES

- Assess overall watershed changes from the fire and fire suppression efforts, particularly those that pose substantial threats to human life, property, and critical natural and cultural resources. This includes evaluating changes to soil conditions, hydrologic function, watershed response to precipitation events, and stream flow conditions.
- Assess soils and loss of vegetation to wind erosion.
- Discuss burn severity.
- Prescribe treatments to mitigate watershed and soil damage impacts and risks.
- Identify future monitoring needs.
- Provide management recommendations to assist in watershed stabilization, road erosion issues, and wind erosion.

II. ISSUES

- Existing roads were damaged by fire response vehicles.
- New roads (wheel tracks) were created by fire response vehicles and dozers.
- Soils in areas with severely burned vegetation are susceptible to wind erosion.

III. OBSERVATIONS

A. Background Information

This report identifies and assesses observed and predicted impacts to soil and watershed function in the Bobcat Fire area on Columbia National Wildlife Refuge (NWR). Measures to reduce significant degradation impacts caused by changes to the watershed due to fire and fire suppression efforts (damage to roads by fire suppression vehicles) are discussed. Recommendations for future monitoring and management considerations are also provided.

Overview of the Bobcat Fire: On July 13, 2007 two fires were ignited in the area by lightning from a passing thunder cell. The Bobcat Fire, Number 13580-9141-DQJ0 was reported at approximately 1245 hours. The other fire was the Highway 26 Fire, fire number 13580-9141-DSZ5. By 1600 the two fires had burned together and became the Bobcat Fire. Ground disturbance within the shrub-steppe plant community was substantial given the fire location and necessary fire suppression

actions (i.e. bulldozing actions) that were employed to prevent the loss of additional acres.

Total acres burned for this fire were 2,412 with 514 of those acres being on United States Fish and Wildlife Service (USFWS) managed land. The private land was mainly on the east and west flanks of the fire. Access on both the north and south ends of this fire proved to be difficult for suppression resources as the fire burned in some very rugged, cliffy, and rocky terrain.

B. Reconnaissance Methodology

Due to the focused nature of the reconnaissance methodology utilized by the First Strike-Shaw team, a through discussion of the entire burned area is not included in this assessment. However, personnel with the USFW provided the Shaw Team a 1/2-day field reconnaissance trip of the Bobcat Fire area. The focus of the trip was along the dirt access road in township 16 north, range 28 east, sections 14, 15, 16, and 21, Willamette Meridian and Baseline. This assessment is based on the observations made during that trip, discussions with USFW staff, and documents reviewed. Maps showing the extent of the fire and recommended areas for seeding are provided in Appendix III. Photographs of the damage are provided in Appendix IV. During the field reconnaissance, Shaw made observations on:

- Burn severity
- Soil Conditions
- Hydrophobic Soils
- Watershed Conditions
- Road Conditions

C. Findings

Overview of Fire Effects.

- Approximately 95 to 98 percent (%) of the area within the fire limits was burned.
- Approximately 45 to 50% of the burned area is susceptible to wind erosion.
- Burn intensities for the area burned can be divided into: 5% low intensity, 25 to 40% moderate intensity, and 50 to 70% severe intensity.
- Approximately 95 to 100% of the vegetation was burned. Regeneration success for bunch grass is anticipated to be 40% and cheat grass is anticipated to be greater than 50%. Invasive species are regenerating along the riparian areas.

Road Damage. Road damage can be divided into two general categories: 1) existing roads and 2) new roads created during fire suppression activities. The road damage by category is discussed below (photo documentation of many of the damaged areas is provided in Appendix IV):

- Pre-existing roads. There are graveled and compacted soil roads in the study area. The preexisting gravel road has received minor damage. Typically short

sections (20 to 30 feet long) of the graveled road where damaged when the heavy vehicles sank through the gravel, disturbing the compacted soil subbase, creating areas of loose silt. The graveled roads were located primarily from the paved public roadway to approximately at the crossing at the discharge end of Deadman Lake (approximately 1.2 miles from the paved road).

The preexisting access road past Deadman Lake was primarily a compacted soil road with a vegetative ground cover, adequate for occasional light truck traffic. The road did not have a constructed subbase. Damage to the road by fire suppression vehicles and heavy fire engine traffic was extensive due to the constant vehicle traffic and heavy weights. The road is now nearly impassable to a normal 4 wheel drive vehicle. Due to the loose soil conditions, fire suppression vehicles would travel off to the side of the preexisting road, creating a wider zone of damage. The formerly compacted road and areas to the side of the road has deteriorated to a loose silt that is approximately 1-foot thick, or more in some locations. Some road segments have ruts up to 1.5-feet deep. The worse sections of road damage are located along the lower portions of the site paralleling Hutchinson and Shiner Lakes (north of the east-west bluff). Roads along the top of the bluff are not as deeply entrenched, but still require treatments.

Additional vehicular traffic will further degrade the road. Rainfall could cause water erosion along steeper sections, which are also subject to wind erosion. There are approximately 8 miles of compacted soil road.

- New roads. Fire suppression efforts along the edges of the fire and along boundary fences created wheel-track trails. The weight of the vehicles have compacted the soils, and negatively impacted native vegetation and microbiotic crusts. The soils are very fragile and were damaged after just a few fire vehicles passed over the same track. In addition, these new tracks provide an increased potential for off-road vehicles to trespass onto the site. Generally these roads are not deeply rutted or filled with deep silt. There are approximately 3 miles of new wheel-track trails.
- Dozer Line. Several dozer lines were cut along the eastern perimeter of the fire. Damage is typically 12 to 15 feet wide. Typically the layer of loose silt is approximately 6-inches deep. However, along the both sides of the dozer line, a small berm (approximately 1.5 feet wide and 1.5 feet high) is present. There is approximately 0.75 miles of dozer line
- Other Areas. At the east end (boundary line) of West Othello Spur Road, the responding fire and electric company vehicles used the area as a staging area and the excessive driving on the grasslands has exposed the bare soils. The area requires immediate stabilization to prevent wind and water erosion. Approximately ½-acre of area is damaged.
- Fence Damage. Fence damage is generally restricted to short sections where the

fence was cut to allow fire suppression vehicles access. A previously damaged section of fence in the southwest corner of section 16 needs replacing because the cattle that graze on the adjacent property are now trampling burned soil, creating animal trails approximately 5-inches deep. These trails are oriented parallel to the slope of the hill, creating preferential pathways for precipitation to freely flow down the trail, creating rill or possibly gully erosion. The lack of adequate fencing allows cattle grazing on adjacent lands to easily move onto the NWR land and graze on the remaining vegetation or new vegetation. Cattle movement will adversely impact soil conditions, increasing the amount of soil loss due to rain and wind erosion.

- Soils Damage. Soils are primarily Prosser-Starbuck very rock, very fine sandy loam on the northern portions of the NWR (below the bluff and along the Hutchinson and Shiner Lakes) and on the eastern portions of the burned area above the bluffs. Scooteneey Loam covers portions of the western part of the bluff. A small area of Scooteneey stony loam is present in the wetlands area in the north portion of section 21. The site generally has topography of outcrops from bluffs (25 to 100 feet tall) creating mesas separated by sandy draws.

The climate is dry and semiarid. Average annual precipitation is approximately 8-inches (Gentry, 1984). Winds generally are from the west, commonly with gusts of 20 to 30 miles per hour.

Soil condition observations during the field reconnaissance are listed below:

- Soils tested with a water bottle at several locations did not demonstrate hydrophobic conditions. Likely due to low to moderate burn severity, a thin layer (approximately 1-inch) of ash from the Mount Saint Helens 1981 eruption, and generally well drained soils. The severely burned area on the western portion of section 15 also did not exhibit hydrophobic soil conditions when tested.
- The microbiotic crusts were well developed and only moderately impacted in most areas.
- Rill and gully erosion was not observed.
- The topography is generally of low relief, individual drainage basins are not large enough to capture large amounts of rainfall for concentration into stormwater runoff channels.

The amount of soil erosion due to rainfall events is likely to be low due to the relatively intact microbiotic soil crust, small pebbles exposed at the surface, and intact vegetation. However, 25-year events (or greater intensity, e.g. 50-year), would have the capability to dislodge and transport soil particles. Large or catastrophic mass soil wasting is not anticipated due to the general low relief of the site, small catchment areas for rainfall, and the thin and rocky nature of the soil.

Wind erosion has the capability to remove and transport fine particles in areas where the vegetation has been burned. The western and northern portions of section 15

were severely burned, leaving little vegetation. The microbiotic crust was also burned. The area appears to receive steady westerly winds and is expected to experience wind erosion. Seeding is necessary to reestablish groundcover to prevent topsoil loss to wind erosion.

IV. RECOMMENDATIONS

A. Emergency Stabilization: (specification related)

To reduce the impacts of wind erosion areas that can be seeded should be. Seed drilling, aerial broadcast, and tractor based broadcast seeding methods are viable options. These stabilization measures are further detailed in the vegetation assessment. Therefore the recommendation is to implement the measures specified in the Vegetation Damage Assessment.

B. Rehabilitation (non-specification related treatments)

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

C. Monitoring (non-specification related)

- USFWS staff should monitor soil erosion conditions along steep sloped areas, such as along the bases of bluffs or where drainages empty into the wetlands along Hutchinson and Shiner Lakes.
- Monitor road conditions on reclaimed roads and rehabilitated roads

D. Management Recommendations (non-specification related)

- Prevent access to roads and fire trails during recovery. Monitor suppression related damage on dirt roads following fall and winter moisture events to see if additional rehabilitation measures are necessary.
- 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.
- Provide for the safety of personnel assigned to rehabilitation operational assignments in the fire area.
- Increase law enforcement patrols through the fire area until vegetation is re-established.

V. Consultations:

Randy Hill, USFWS
Rick Poetter, Refuge Manager USFWS

VI. References:

Gentry, Herman R. 1984. Soil Survey of Grant County, Washington. Prepared by the United States Department of Agriculture, Soil Conservation Service, in cooperation with the Washington State University, Agriculture Research Center. January.

**BURNED AREA EMERGENCY STABILIZATION PLAN
BOBCAT FIRE
WETLAND AND RIPARIAN RESOURCE ASSESSMENT**

I. OBJECTIVES

- Evaluate and assess fire and suppression impacts to wetland and riparian resources and identify values at risk associated with vegetation losses.
- Determine emergency stabilization and monitoring needs supported by specifications to aid in wetland and riparian vegetation recovery and soil stabilization.
- Provide management recommendations to assist in wetland and riparian recovery, site productivity and species habitat protection.

II. ISSUES

- Protection and enhancement of other resource values including site productivity, wildlife habitat, vegetation resources, cultural resources and watershed stability.
- Management strategies which provide for the stabilization, natural regeneration and recovery of impacted areas.
- Immediate stabilization of denuded soils that may impact ecological function.
- 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

This report identifies and addresses known and potential impacts to wetland and riparian resources within the Bobcat Fire (Fire) area on Columbia National Wildlife Refuge (Refuge). The Fire started on July 13, 2007 and burned 1900 acres of contiguous area, 514 acres of which were located on the Refuge.

The wetland resources are predominantly Palustrine emergent persistent (PEM1), Lacustrine, limnetic, unconsolidated bottom, permanently flooded (L1UBH) areas (Shiner and Hutchinson Lakes) and both perennial and ephemeral alkaline depressions (Figures 5-7, 10). Palustrine emergent wetlands can be divided into two types: persistent and non-persistent. Persistent palustrine emergent wetlands are dominated by species that normally remain standing at least until the beginning of the next growing season. Common plants found in this habitat include cattails (*Typha* spp.), bulrushes (*Juncus* spp.), sawgrass (*Cladium* spp.) and other sedges (*Carex* spp.), and true grasses, such as reed (*Calamagrostis* spp.) and manna grasses (*Glyceria* spp.). A variety of broad-leafed persistent emergents such as purple loosestrife (*Lythrum salicaria*), and dock (*Rumex* spp.) are also present.

Open water habitats vary in several physical characteristics, including depth and substrate. The common aquatic, submerged plant species include milfoil (*Myriophyllum spicatum*), coontail (*Ceratophyllum demersum*) mare's-tail (*Hippuris vulgaris*), and pondweed (*Potamogeton pectinatus*).

Riparian zones are areas where vegetation derives its hydrologic support from a water body, or its seasonal overflow. The plant communities along the shoreline margins comprise the riparian vegetation zone and are characterized by hydrophilic plants. Hydrophilic plants are specially suited to survive in soils that are always wet. The riparian areas are generally narrow, ~1-15 m, and are very dense with vegetation.

Findings and recommendations contained within this assessment are based upon field reconnaissance of the fire area, interviews with local resource specialists, local land managers, and review of relevant documents.

This report will detail the known damage to the wetland and riparian areas, will discuss future monitoring criteria, and will outline management considerations for recovery of wetland and riparian resources.

A. Reconnaissance Methodology

Ground reconnaissance was conducted and photographs were taken on July 14, 18 and August 1, 2007 by United States Fish and Wildlife Service (USFWS) personnel and September 5, 2007 by the First Strike/Shaw Environmental Burned Area Emergency Response (BAER) Team Biologist and USFWS employee Howard Browers. The photo documentation section of this plan is contained in Appendix III. Field reconnaissance was limited to the northern portion of the Fire area, primarily along the shoreline, and two isolated wetlands, one on the western border of the burn (Figure 12) and one along the north eastern border (Figure 10). These were the only potentially impacted areas that contained wetlands and/or riparian features. Assessments to these resources were conducted since wetlands and riparian areas consistently provide valuable wildlife forage and habitat, watershed protection, water quality functions and flood prevention. Also, if the wetland plants are damaged by a very hot fire, they will not re-establish in the growing season and erosion may occur (<http://www.wetland.org.za/news.htm=&NodeId=912&Id=36>).

B. Findings

1. Wetlands and riparian areas

Wetland habitats on the Fire are associated with water flows from Hayes Creek. These waters drain into Shiner and Hutchinson Lakes. The majority of wetland and riparian features are found where these two lakes meet land to the south. The

associated wetlands and riparian zones are the result. The wetland areas are comprised of standing or slow moving water and are dominated by emergent vegetation, namely cattails and bulrushes (Figure 2). The cattails (*Typha latifolia*) and bulrushes (*Scirpus acutus*) are commonly one to three meters tall and grow in dense stands with little open water between. Few other species grow in these dense stands of emergent wetland vegetation. The edge of the wetlands, as one moves towards the upland riparian areas, is much more diverse. Numerous species thrive in this transition zone from wetlands to sedge (*Carex* spp.) or saltgrass (*Distichlis spicata*) meadow. Several plants are characteristic of the zone, including marsh sow thistle (*Sonchus uliginosus*) and the annual paintbrush (*Castilleja exilis*). Shrubs are not characteristic of these wetlands, although greasewood (*Sarcobatus vermiculatus*) is found at the edge of the wetlands. Ground cover is high, commonly 80 to 100% (NUS Corporation, 1981).

The riparian areas (Figure 1) have a steeper moisture gradient than the aforementioned wetlands, and the shrubs and herbaceous layer vary considerably. Dominant shrubs are goldenrod (*Solidago* spp.) and white sweet clover (*Melilotus alba*).

None of the wetland or riparian areas was impacted by the Fire (Figure 9). Due to the lowered intensity burn near the associated areas and the inherent fire retarding abilities of wetland vegetation, neither of these resources was harmed. The areas surrounding the wetland and riparian resources were impacted though as Figures 3, 4, and 9 shows in detail. Sagebrush (*Artemisia* spp.) near the edge of the northern cliffs was obliterated; leaving only concentric shaped, circular piles of ash where the shrubs once stood. The cliffs often provided a break, and subsequent end to the fire, but occasionally the fire made its way to the shrub-steppe below the cliffs (Figure 9). As evidenced in this photo, the intensity of the fire was much weaker by this stage of the event, and saltgrass (*Distichlis spicata*) and greasewood (*Sarcobatus* spp.) are already regenerating quite rapidly. Stabilization of the surrounding lands and cliffs will be important though to reduce soil erosion and non-native species recruitment. This region of the state is normally quite dry, averaging ~6 inches of rain annually, but 50-year flood events could prove damaging to the shoreline adapted vegetation, silting over roots and potentially altering the pH of the present water with the infusion of ash.

The depressional wetland towards the eastern portion of the Fire (Figure 10) deserves special attention. This is an ephemeral, alkaline depressional wetland. As evidenced in the aforementioned photo, the Fire raged all around this site. Though not directly impacted by the Fire, stabilization of the surrounding shrub-steppe habitat is recommended to avoid erosion damage. These specifications are contained in the vegetation emergency stabilization assessment.

2. Associated Wetland and Riparian Vegetation:

The Fire burned a total of approximately 1900 acres, 514 of those acres were on Refuge lands. The area directly to the south of the wetland riparian complex was impacted (Figure 4). None of the wetland or riparian areas was directly impacted by the fire.

The following wetland and riparian vegetation was noted:

Species	
Scientific Name	Common Name
<i>Typha latifolia</i>	Common cattail
<i>Scirpus americanus</i>	American bulrush
<i>Scirpus acutus</i>	Hardstem bulrush
<i>Sonchus arvensis</i>	Sow thistle
<i>Sarcobatus vermiculatus</i>	Greasewood
<i>Eleocharis palustris</i>	Common spike rush
<i>Cirsium arvense</i>	Canada thistle
<i>Euthamia occidentalis</i>	Western Goldenrod
<i>Rosa woodsii</i>	Woods' rose
<i>Scirpus olneyi</i>	Chairmaker's bulrush
<i>Elymus glaucus</i>	Blue wild Rye
<i>Carex lanuginosa</i>	Woolly sedge
<i>Carex praegracilis</i>	Clustered field sedge
<i>Solidago canadensis</i>	Canada Goldenrod
<i>Agropyron spicatum</i>	Blue bunch wheatgrass
<i>Anaphalis margaritacea</i>	Western pearly everlasting
<i>Bromus tectorum</i>	Cheatgrass
<i>Castilleja exilis</i>	Indian paintbrush
<i>Epilobium minutum</i>	Minute willow-herb
<i>Phragmites australis</i>	Common reed
<i>Solanum dulcamara</i>	Bittersweet
<i>Melilotus alba</i>	White sweet clover
<i>Cirsium vulgare</i>	Bull thistle
<i>Toxicodendron radicans</i>	Poison ivy
<i>Lactuca saligna</i>	Willowleaf lettuce
<i>Scirpus maritimus</i>	Alkali bulrush
<i>Equisetum hyemale</i>	Scouring rush
<i>Asparagus officinalis</i>	Wild asparagus
<i>Rumex spp.</i>	Dock
<i>Ribes aureum</i>	Golden currant

3. Vegetation/Structural Impacts

Wetland and riparian resources were not directly impacted by the Fire or by suppression tactics utilized to control the fire. Potential impacts to these resources could indirectly result from:

- a) Erosion from nearby burned areas depositing silt into wetlands
- b) Recruitment of opportunistic, non-native invasive species that thrive in recently disturbed areas. Areas where emergency fire suppression vehicles drove have been infiltrated by Canada thistle (*Cirsium arvense*)(Figure 11). This is an aggressive, creeping perennial weed that infests disturbed areas. Generally, infestations start on disturbed ground, including ditch banks, overgrazed pastures, tilled fields or abandoned sites. Colonization of large areas throughout the burn by this thistle could prove troublesome and once established, this species can prove very difficult to eradicate.

IV. RECOMMENDATIONS

A. Fire Suppression:

Suppression account – Spray areas where Canada thistle (*Cirsium arvense*) is colonizing. Also, replant and reseed all disturbed areas resulting from suppression actions with native species to protect the ecological integrity of the area. Though neither the wetlands nor riparian areas were directly affected, they could become impacted unless the surrounding damaged areas are restored. Seeding and planting will be postponed until fall of 2007 or until such time as adequate moisture provides a firm seedbed for stabilization actions. This action will ensure that excessive siltation will not impact the wetland and riparian areas.

B. Emergency Stabilization: (specification related)

None.

C. Management Recommendations: (non-specification related)

Although none of the wetland or riparian areas was damaged as a result of the Fire, the following recommendations are offered to assist in the timely recovery of the surrounding affected areas:

- **Non-native Invasive Species Control – Native Plantings**
Install native plants in burned area to stabilize ecological integrity to the adjacent native shrub steppe community, to prevent invasion by noxious weeds and non-native species, and to stabilize soils and reduce erosion that threatens site degradation. The area's sagebrush was obliterated, quite possibly eliminating any remaining viable seed sources throughout the burn. Re-establishing this shrub will be an important aspect of the Emergency Stabilization plan. Specifications are contained in the vegetation ES assessment.
- Ensure that non-native invasive species do not infiltrate the edge of the riparian buffer to the wetlands.

VI. References

“Columbia National Wildlife Refuge Wildlife and Habitats.” Available:
<http://www.fws.gov/columbiarefuge/WildlifeandHabitat/habitats.html>

Nus Corporation. 1981. Final report; Columbia National Wildlife Refuge Habitat and Wildlife Inventory, Contract # 14-16-0001-79198.

“Six wetland foes that can become friends”. Available:
<http://www.wetland.org.za/news.htm=&NodId=912&Id=36>. Posted on 2003/09/16
02:37:14 PM

APPENDIX II - ENVIRONMENTAL COMPLIANCE

Federal, State, and Private Lands Environmental Compliance Responsibilities

All projects proposed in the BOBCAT Fire Burned Area Emergency Response 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 the Council on Environmental Quality (CEQ) Regulations (40 CFR 1500-1508); Department of the Interior and FISH AND WILDLIFE SERVICE. This Appendix documents the burned area emergency response team considerations of NEPA compliance requirements for prescribed emergency stabilization and monitoring actions described in this plan for all jurisdictions affected by the BOBCAT Fire.

Related Plans and Cumulative Impact Analysis

COLUMBIA NATIONAL WILDLIFE REFUGE Fire Burned Area Emergency Response Plan, September 17, 2007. The COLUMBIA NATIONAL WILDLIFE REFUGE Fire Burned Area Emergency Response Plan was reviewed and it was determined that actions proposed in the BOBCAT Fire Burned Area Emergency Response Plan within the boundary of the COLUMBIA NATIONAL WILDLIFE REFUGE Fire are consistent with the management objectives established in the Comprehensive Conservation Plan. The Comprehensive Conservation Plan NEPA compliance process specifically addresses:

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 stabilization treatments for areas affected by the BOBCAT Fire, as proposed in the BOBCAT Fire Burned Area Emergency Response 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. The treatments are consistent with the above jurisdictional management plans and associated environmental compliance documents and categorical exclusions listed below.

Applicable and Relevant Categorical Exclusions

The individual actions proposed in this plan for COLUMBIA NATIONAL WILDLIFE REFUGE are Categorically Excluded from further environmental analysis. If applicable and relevant Department and Agency Categorical Exclusions are listed below. Categorical Exclusion decisions were made with consideration given to the results of required emergency consultations completed by the Burned area emergency response team and documented below.

Statement of Compliance for the BOBCAT Fire Burned Area Emergency Response Plan.

This section documents consideration given to the requirements of specific environmental laws in the development of the BOBCAT Fire Burned Area Emergency Response 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 BOBCAT Fire Burned Area Emergency Response Plan:

- National Historic Preservation Act (NHPA).
- Executive Order 11988. Floodplain Management.
- Executive Order 11990. Protection of Wetlands.
- Executive Order 12372. Intergovernmental Review.
- Executive Order 12892. Federal Actions to Address Environmental Justice in Minority and Low-income Populations.
- Endangered Species Act.
- Secretarial Order 3127. Federal Contaminated
- Clean Water Act.
- Clean Air Act.

CONSULTATIONS

- *Please see Appendix I, Assessments*

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

(Yes) (No)

- () Adversely affect Public Health and Safety
- () Adversely affect historic or cultural resources, wilderness, wild and scenic rivers aquifers, prime farmlands, wetlands, floodplains, ecologically critical areas, or Natural Landmarks.
- () Have highly controversial environmental effects.
- () Have highly uncertain environmental effects or involve unique or unknown environmental risks.
- () Establish a precedent resulting in significant environmental effects.
- () Relates to other actions with individually insignificant but cumulatively significant environmental effects.
- () Adversely effects properties listed or eligible for listing in the National Register of Historic Places
- () Adversely affect a species listed or proposed to be listed as Threatened or Endangered.
- () Threaten to violate any laws or requirements imposed for the "protection of the environment" such as Executive Order 1 1988 (Floodplain Management) or Executive Order 1 1 990 (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 will be prepared. A report will be prepared under contract as specified by the Burned Area Emergency Response Plan.

A NHPA Clearance Form:

- Is required because the project may have affected a site that is eligible or on the national register. The clearance form is attached. SHPO has been consulted under Section 106 (see Cultural Resource Assessment, Appendix I).
- Is not required because the Burned Area Emergency Response Plan has no potential to affect cultural resources (initial of cultural resource specialist).

Other Requirements

(Yes) (No)

- () Does the Burned Area Emergency Response 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 BOBCAT Fire Burned Area Emergency Response Plan in accordance with the criteria above and have determined that the proposed actions would not involve any significant environmental effect. Therefore it is categorically excluded from further environmental (NEPA) review and documentation. Burned area emergency response team technical specialists have completed necessary coordination and consultation to insure compliance with the National Historic Preservation Act, Endangered Species Act, Clean Water Act and other Federal, State and local environment review requirements.

Robert Krueger
Burned Area Emergency Response Team Environmental Protection Specialist

Date

Gregory Hughes
Project Leader, MID-COLUMBIA NATIONAL WILDLIFE REFUGE

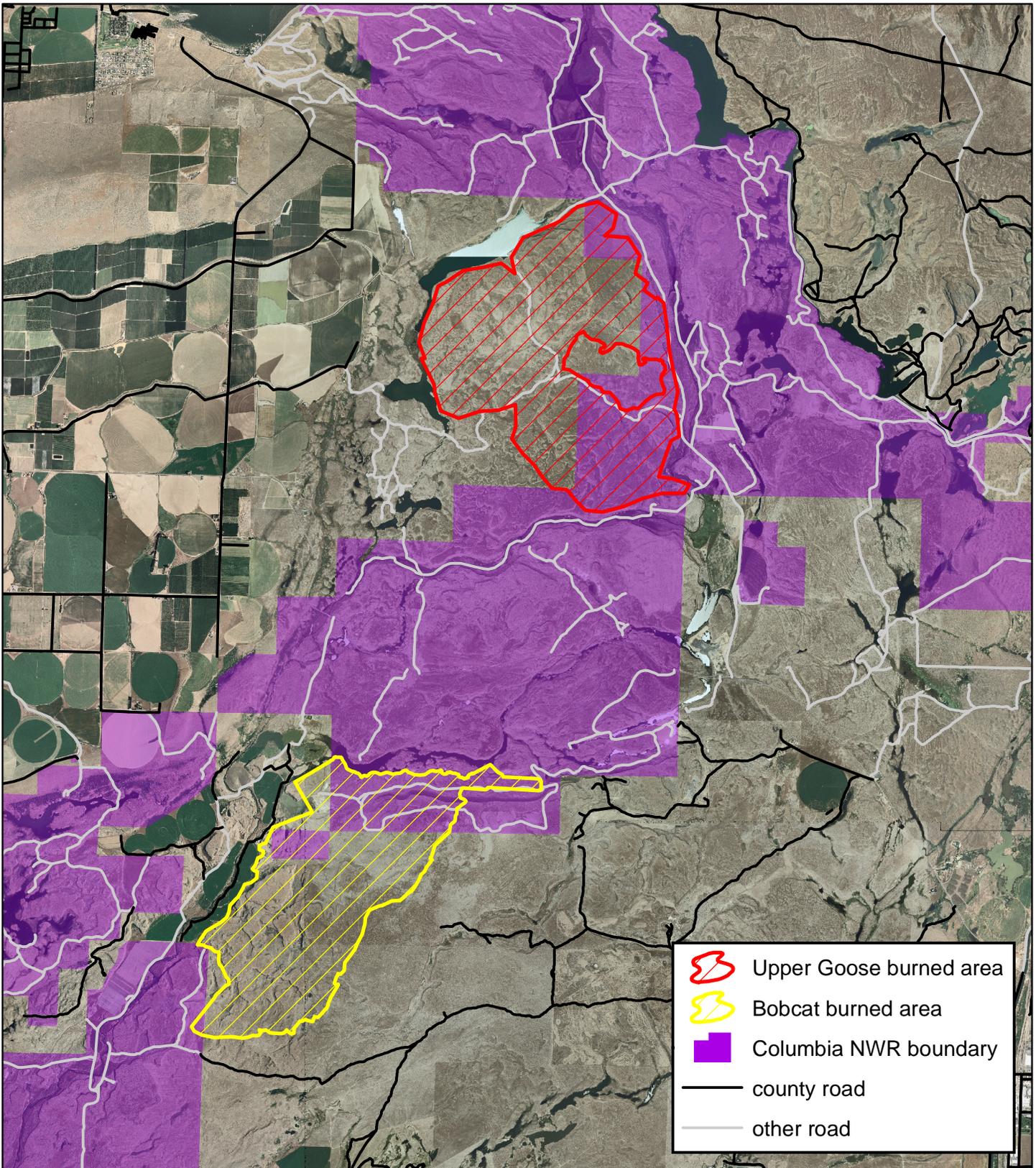
Date

APPENDIX III - MAPS

MAPS, 8 Pages (all are .pdf format)

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.

1. *Columbia NWR Fires, 6 September 2007*
2. *Bobcat Fire – Burned Area, 9 August 2007*
3. *Bobcat Fire – Burned Area, 9 August 2007*
4. *Bobcat Fire – Burned Area, 5 September 2007*
5. *Bobcat Fire – ESR Plan, 14 August 2007*
6. *Bobcat Fire – Vegetation Cover, 5 September 2007*
7. *Bobcat Fire – Soils, 5 September 2007*
8. *Bobcat Fire – Listing Provided by USFWS, 5 September 2007*

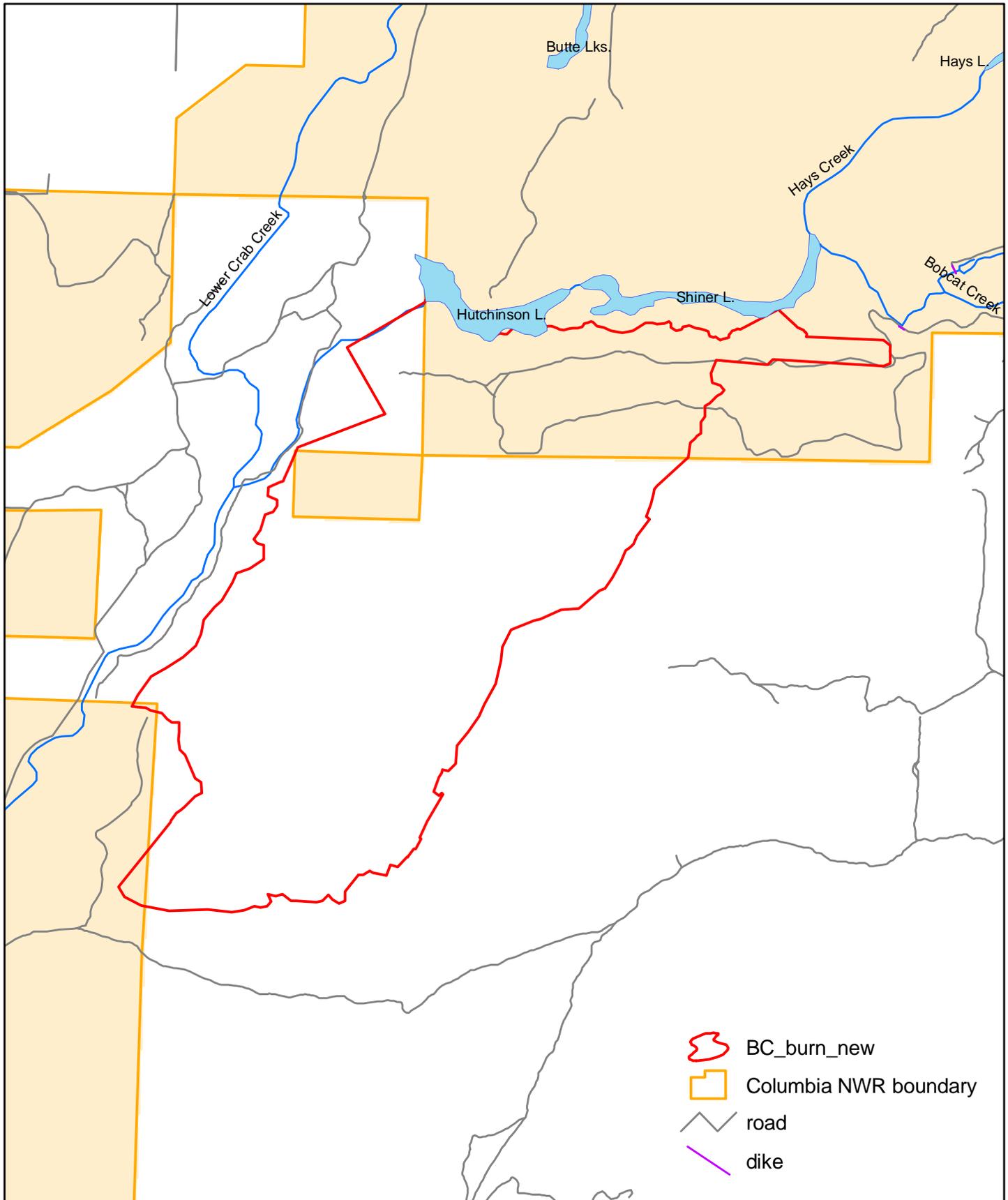


Upper Goose and Bobcat Fires on Columbia NWR

File name: CNWR_fires_locator.mxd
Map date: 6 September 2007

Upper Goose Fire started 13 July 2007. Burned 2,258 acres total; 705 acres on CNWR.
Bobcat Fire started 13 July 2007. Burned 1,900 acres total; 514 acres on CNWR.

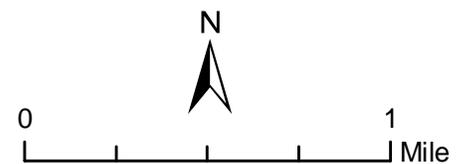


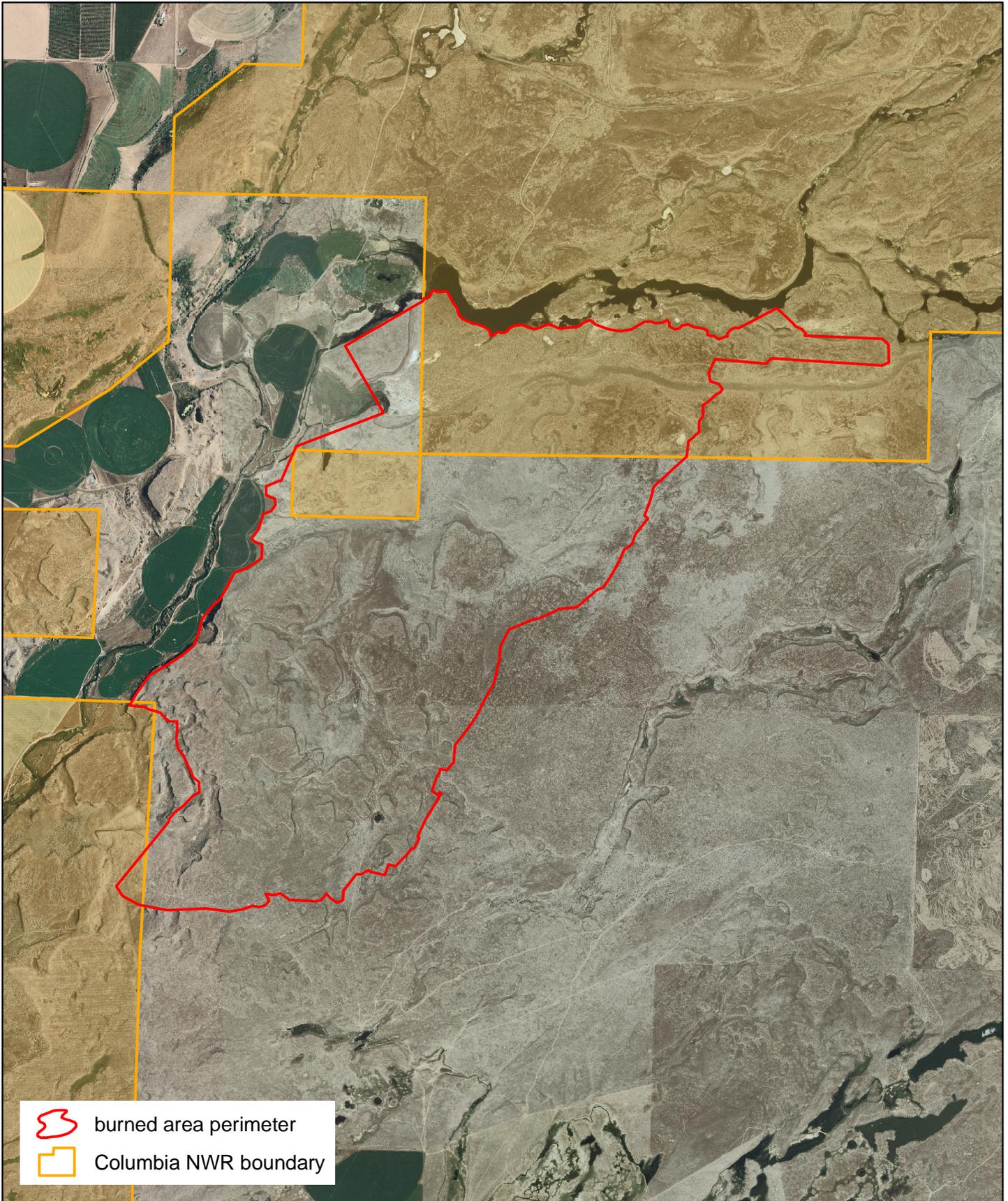


Bobcat Fire -- Burned Area

File name: Bobcat_burned_area.mxd
Map date: 9 August 2007

Started 13 July 2007 > Approximately 1,900 acres burned, of which 514 acres were on CNWR

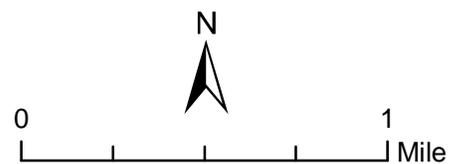


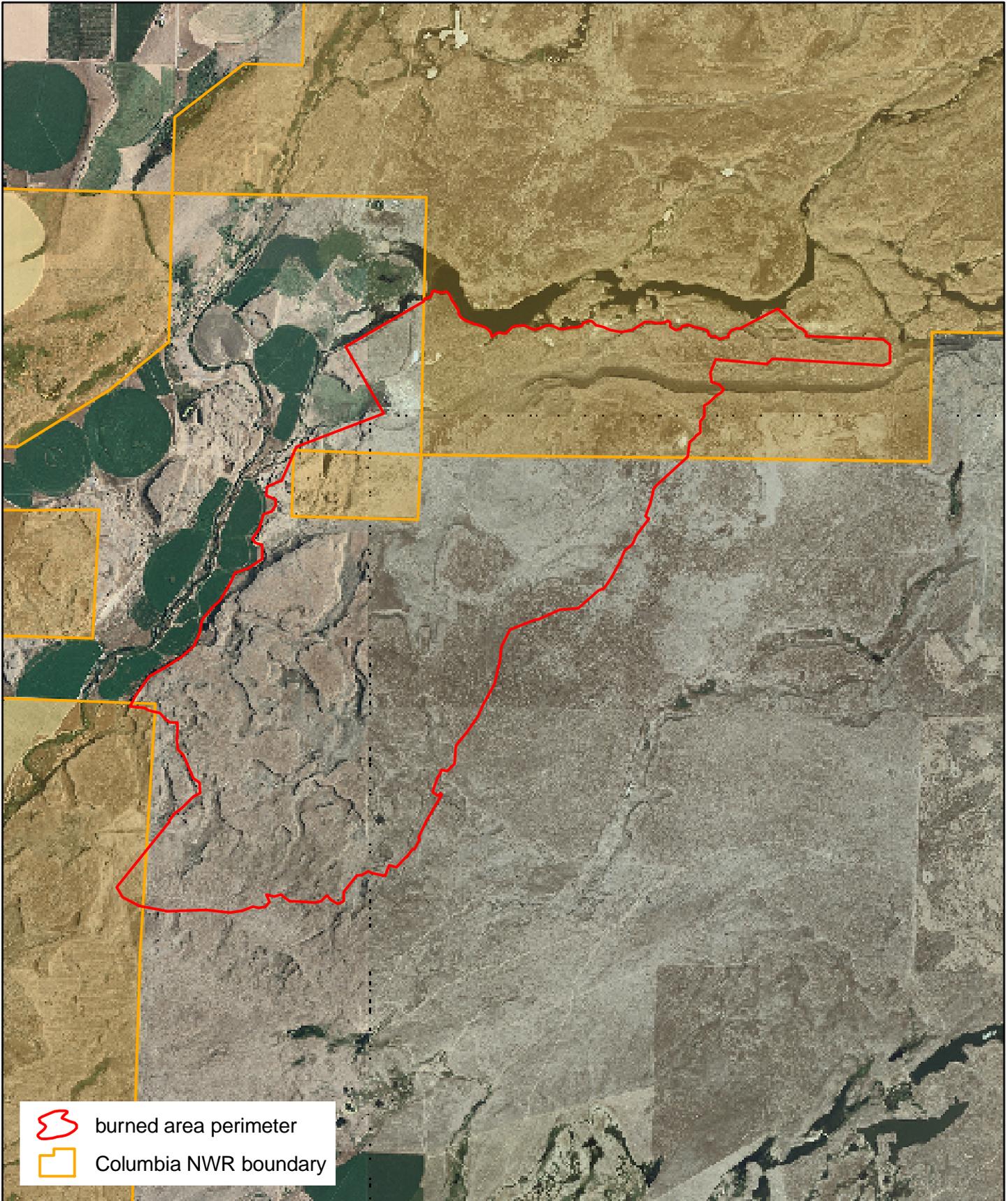


Bobcat Fire -- Burned Area

File name: BobcatFire_burned_area.mxd
Map date: 5 September 2007

Started 13 July 2007 > Approximately 1,900 acres burned, of which 514 acres were on CNWR

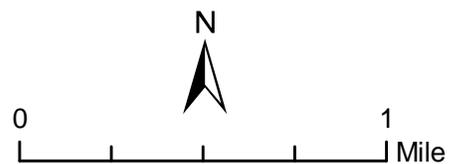


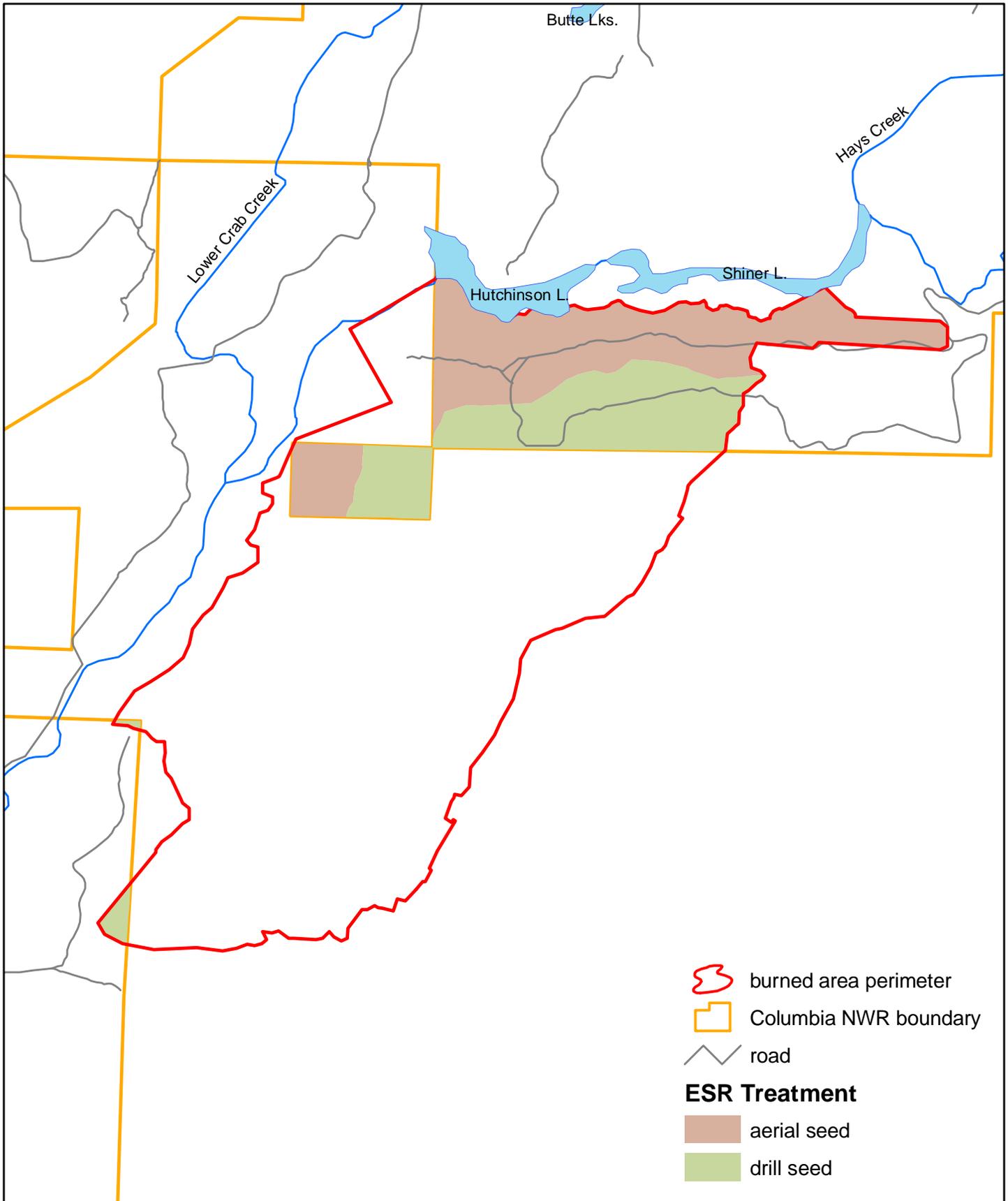


Bobcat Fire -- Burned Area

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Map date: 9 August 2007

Started 13 July 2007 > Approximately 1,900 acres burned, of which 514 acres were on CNWR

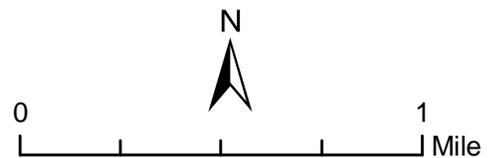


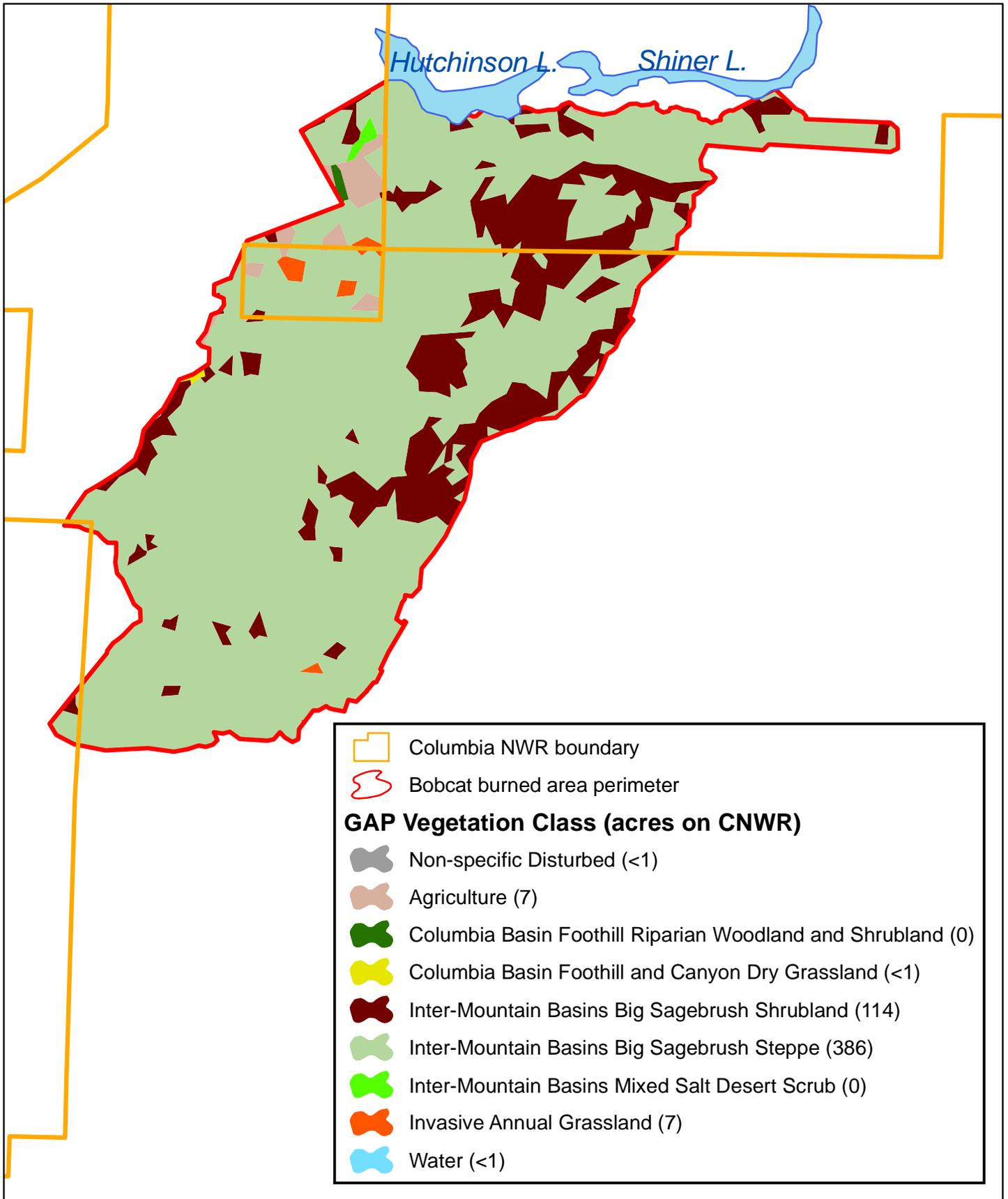


Bobcat Fire -- ESR Plan

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Map date: 14 August 2007

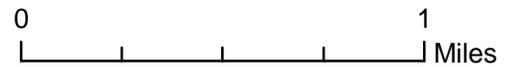
Started 13 July 2007 > Approximately 1,900 acres burned, of which 514 acres were on CNWR

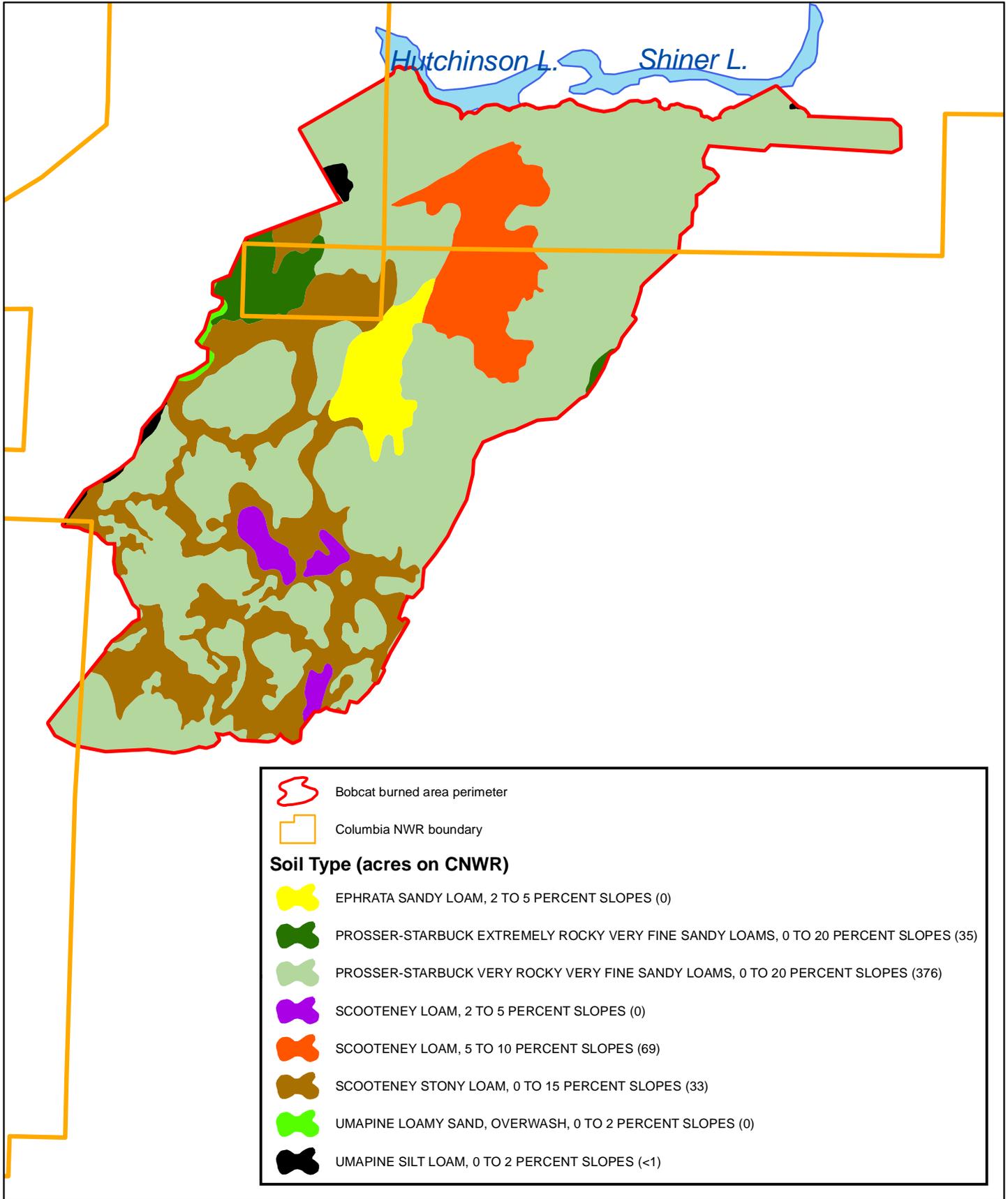




Bobcat Fire -- Vegetation Cover

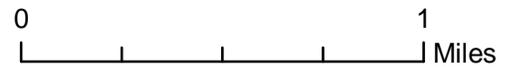
File name: BobcatFire_veg_cover.mxd
Map date: 5 September 2007





Bobcat Fire -- Soils

File name: BobcatFire_soils.mxd
Map date: 5 September 2007



**APPENDIX IV – PHOTO DOCUMENTATION
BOBCAT FIRE – WETLAND RIPARIAN
COLUMBIA NATIONAL WILDLIFE REFUGE**



Figure 1. NE corner of Bobcat Fire showing intact riparian wetland complex



Figure 2. NE corner of Bobcat Fire along Shiner Lake showing intact riparian wetland complex

**APPENDIX IV – PHOTO DOCUMENTATION
BOBCAT FIRE – WETLAND RIPARIAN
COLUMBIA NATIONAL WILDLIFE REFUGE**



Figure 3. Obliterated sagebrush (*Artemisia spp.*) near cliff edge along Shiner Lake NE corner of Bobcat Fire



Figure 4. Obliterated sagebrush (*Artemisia spp.*) looking south from cliff edge along Shiner Lake NNE corner Bobcat Fire

**APPENDIX IV – PHOTO DOCUMENTATION
BOBCAT FIRE – WETLAND RIPARIAN
COLUMBIA NATIONAL WILDLIFE REFUGE**



Figure 5. Depressional alkaline wetland with red algal bloom, northern Bobcat Fire



Figure 6. Close up of red algal bloom in depressional wetland, northern Bobcat Fire

**APPENDIX IV – PHOTO DOCUMENTATION
BOBCAT FIRE – WETLAND RIPARIAN
COLUMBIA NATIONAL WILDLIFE REFUGE**



Figure 7. Close up of red algal bloom in depression wetland, northern Bobcat Fire



Figure 8. Columnar basalt cliffs along northern edge of Bobcat Fire

**APPENDIX IV – PHOTO DOCUMENTATION
BOBCAT FIRE – WETLAND RIPARIAN
COLUMBIA NATIONAL WILDLIFE REFUGE**



Figure 9. Burnline up to intact riparian wetland complex, north Bobcat Fire, showing regeneration of salt grass (*Distichlis stricta*)



Figure 10. Seasonal, alkaline depressional wetland.

**APPENDIX IV – PHOTO DOCUMENTATION
BOBCAT FIRE – WETLAND RIPARIAN
COLUMBIA NATIONAL WILDLIFE REFUGE**



Figure 11. Canada thistle (*Cirsium arvense*) colonizing where emergency vehicles drove.



Figure 12. ~3 acre depressional wetland.

**BURNED AREA EMERGENCY STABILIZATION PLAN
BOBCAT FIRE- COLUMBIA NATIONAL WILDLIFE REFUGE**

APPENDIX IV: PHOTO DOCUMENTATION – Shrub-steppe

- Soil and Erosion Issues
- Vegetation Resources Issues
- Wildlife Resource Issues



Soil and Erosion Issues



Photo 1. Dust devil on Bobcat burned area in background of photo.



Photo 2. Exposed erodable sandy soils.

Vegetation Resources Issues



Photo 3. Intensely burned sagebrush-steppe area



Photo 4. Intensely burned shrub-steppe area.

Wildlife Resource Issues



Photo 6. Mule deer buck traversing Bobcat burned area.



Photo 7. Intensely burned shrub-steppe habitat.

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
1. Determine whether known historic properties may be at risk of further degradation.	\$16,150.60
2. Non-native invasive species control- Integrated Pest Management.	\$38,080.00
3. Ecological Stabilization- Native Seeding.	\$163,196.50
4. Emergency Stabilization Plan Development	\$32,400.00
Total Cost	\$249,827.10

Part 2. Probability of Rehabilitation Treatments Successfully Meeting EFR Objectives

Treatments	Units	%
1. Determine whether known historic properties may be at risk of further degradation.	514 Acres	100
2. Non-native invasive species control- Integrated Pest Management.	514 acres	75
3. Ecological Stabilization- Native Seeding.	514 acres	75
4. Emergency Stabilization Plan Development	1 each	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			
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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

Exhibit 6-1 NATIVE/NON-NATIVE PLANT WORKSHEET

The Seed Mix listed below has been requested by USFWS for use on the Bobcat Fire ES Plan on September 5, 2007 and is included in Part F and Appendix III of this ES Plan.

Grasses

- Needle and thread grass (*Stipa comata*) 0.2 lbs/acre
- Sandberg's bluegrass (*Poa sandbergii*) (Hanford) 2 lbs./ac.PLS
- Bottlebrush squirreltail (*Elymus elymoides*) 1.5 lbs./ac PLS
- Bluebunch wheatgrass (*Pseudoroegneria spicata*) 4 lbs./ac PLS
- Sand dropseed

Shrubs

- Wyoming Big Sagebrush(*Artemisia tridentate* ssp. *wyomingensis*)
0.1 lbs/ac PLS

ADAMS COUNTY
Updated 8/8/2007

LISTED

Endangered

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

Threatened

Spiranthes diluvialis (Ute ladies' -tresses), plant

CANDIDATE

Washington ground squirrel (*Spermophilus washingtoni*)

SPECIES OF CONCERN

Animals

Bald eagle (*Haliaeetus leucocephalus*) (delisted, monitor status)

Burrowing owl (*Athene cuniculari*)

Ferruginous hawk (*Buteo regalis*)

Loggerhead shrike (*Lanius ludovicianus*)

Long-eared myotis (*Myotis evotis*)

Northern leopard frog (*Rana pipiens*)

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

Sagebrush lizard (*Sceloporus graciosus*)

Vascular Plants

Polemonium pectinatum (Washington polemonium)



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

[Advanced Search](#)

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

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

- State Monitor Species

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-BREASTED 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
BOCACCIO 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
YELLOW EYE ROCKFISH	<i>SEBASTES RUBERRIMUS</i>	Fish	none	SC	IO
MARGINED SCULPIN	<i>COTTUS MARGINATUS</i>	Fish	FCo	SS	IO
MERRIAM'S SHREW	<i>SOREX MERRIAMI</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</i>	Mammal	FCo	SC	B,CR
PALLID TOWNSEND'S BIG-EARED BAT	<i>CORYNORHINUS TOWNSENDII</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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E-mail <webmaster@dfw.wa.gov>