J08B SODA

BLM/BOISE DISTRICT/OWYHEE FIELD OFFICE
BLM/VALE DISTRICT/MALHEUR FIELD OFFICE
IDAHO STATE OFFICE/OREGON STATE OFFICE

FIRE SUMMARY

Fire Name	SODA
Fire Number	J08B
District/Field Office	BOISE/OWYHEE VALE/MALHEUR
Admin Number	LLIDB03000 LLORV04000
State	IDAHO/OREGON
County(s)	OWYHEE/MALHEUR
Ignition Date/Cause	8/10/15 LIGHTNING
Date Contained	8/23/15

Jurisdiction	**Combined**	**Idaho**	**Oregon**
BLM	225,953	179,639	46,314
BOR	157	157	0
State	12,896	12,097	785
Private	40,138	36,184	3,954
Total	**279,144**	**228,077**	**51,067**

IDAHO Total Acres	179,639
IDAHO Total Costs	56,943,000
Costs to LF2200000	40,197,000
Costs to LF3200000	9,355,000
Costs to LF3100000	7,299,000
Costs to LF2000000	92,000

OREGON Total Acres	46,314
OREGON Total Costs	10,406,000
Costs to LF2200000	4,179,000
Costs to LF3200000	1,627,000
Costs to LF3100000	4,600,000
Costs to LF2000000	0

Status of Plan Submission (check one box below)

X	Initial Submission of Complete Plan
	Amendment
	Updating or Revising the Initial Submission

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Background Information

On August 10, 2015, the Soda Fire started eight miles northeast of Jordan Valley, Oregon. The fire burned a total of 279,144 acres in Owyhee (Idaho) and Malheur (Oregon) counties. The Soda fire was declared 100% contained on August 23, 2015. An Interdisciplinary Team (IDT) was assembled on August 18, which included local resource specialists, to assess values affected by the fire. The team consisted of individuals representing hydrology, soils, geology, cultural resources, wildlife, vegetation, fisheries, recreation, rangeland management, engineering, hazardous materials, noxious weeds, fuels, and geographic information systems (GIS). Field reconnaissance occurred between August 19 and August 23, 2015. Data from the field missions were compiled, and added to existing, pre-burn information to create a list of values threatened by the fire or potential post-fire effects. Coordination was established with the Tribes and state and federal agencies. Cooperating agencies include: Shoshone-Paiute Tribes, Idaho Department of Fish and Game, Idaho Department of Lands, Idaho State Department of Agriculture, Oregon Parks and Recreation, Succor Creek State Natural Area, and the Natural Resource Conservation Service in Idaho and Oregon, Owyhee County Commissioners, and affected permittees.

Rapid Assessment Process

The timelines associated with emergency response planning require a rapid assessment of post-fire changes to values at risk at a landscape level. Field reconnaissance and data compilation/analysis within an incident as large as the Soda fire requires a highly coordinated effort between an interdisciplinary team, the local field offices, Tribes, state and federal agencies, landowners, permittees, and suppression forces. Information used in this report was generated from field reconnaissance, review of relevant literature, management plans, GIS databases, and discussions with stakeholders. Field reconnaissance consisted of individual programs completing on-site inspection of fire impacted habitats, recreation sites, grazing allotments, and other site specific values and hazards on BLM lands. An official species list was generated from the Boise and Portland Fish and Wildlife Offices to identify federally listed species within and adjacent to the fire perimeter. Additionally, BLM's GIS and field survey databases were accessed to determine if there were known occurrences within the fire perimeter or immediately downstream. Hydrologic models were developed to estimate risks to structures and important habitat areas from run-off and sedimentation. Satellite imagery was also used to develop maps of soil burn severity and vegetation mortality within the fire perimeter.

Report assessments for each specialist group were provided detailing the post fire impacts to individual resources and are located within the project record. These report assessments, along with additional site visits and meetings with Owyhee field office and other local specialists were utilized to prepare this plan.

Response Actions

Many threats were identified during this assessment; however, the team concluded that the threats listed below pose the greatest risk across the landscape:

- Expansion of invasive plant species
- Habitat recovery for threatened species
- Increased runoff, erosion potential, and resulting flooding
- Loss of cultural resources

Primary objectives of the actions proposed include:

- Minimize threats to human life and property
- Minimize threats to known critical cultural resource values
- Stabilize and prevent degradation to natural resources
- Restore habitat for federal candidate species
- Mitigate watershed response and stabilize soils

- Reduce post-fire effects and the likelihood of future large wildfires
- Minimize the establishment and spread of noxious weeds and invasive species
- Repair/replace fire-damaged facilities

This plan has identified an initial set of treatments that must be applied collectively to increase the likelihood of success, especially when considering the steps toward the recovery of habitat for the *Centrocercus urophasianus*, greater sage-grouse, (hereafter "sage-grouse"). These actions are summarized in the Treatment Section below and have been designed to mitigate identified threats. These actions will either:

- Mitigate the immediate threat, or
- Achieve the stabilization objectives, or
- Provide the foundation to proceed with further rehabilitation or restoration, or
- Restore vegetation to provide fully functioning, resilient and resistant habitat.

NEPA and Project Development Plans and Feasibility Evaluation

Several of the proposed actions are covered under existing NEPA documents and are immediately implementable, pending funding and alignment of assets. However, future actions for the steps needed to continue towards rehabilitation and restoration of the landscape and associated sage-grouse habitat, may require additional NEPA and collaboration with partners for the next implementation steps.

The following is a list of the applicable NEPA documents that are related to the treatments proposed in the implementation section of this document.

Land Use Plans

- Owyhee Resource Management Plan (RMP) 1999
- Southeastern Oregon RMP 2002
- Respective District Fire Management Plans

Other Applicable Plans

- 2007 Vegetation Treatments Using Herbicides on BLM lands in 17 Western States ROD (National Vegetation Final Environmental Impact Statement (FEIS))
- Vale District Normal Fire Emergency Stabilization and Rehabilitation Plan EA 2005
- Boise District Normal Fire Emergency Stabilization and Rehabilitation Plan EA 2005
- Buzzard Complex Fire Emergency Stabilization and Rehabilitation Plan EA DOI-BLM-OR-V040-2014-0076-EA
- Boise District Noxious and Invasive Weed Treatment EA 2007
- Vale BLM District Five Year Integrated Weed Control Plan EA (OR-030-89-19)
- Idaho and Southwestern Montana Greater Sage-Grouse Final EIS (Draft)

Other Related Documents

- Idaho and Southwestern Montana Greater Sage-Grouse Approved Resource Management Plan Amendment, September 2015.
- National Greater Sage-Grouse Conservation Measures/Planning Strategy.
- Instruction Memorandum No. 2012-043, Greater Sage-Grouse Interim Management Policies and Procedures, 2011.
- Instruction Memorandum No. 2013-035, Requirements for Processing and Approving Temporary Public Land Closure and Restriction Orders, 2012.
- Idaho's Standards for Rangeland Health and Guidelines for Livestock Grazing Management

- Herbicides Approved for Use on BLM Lands in Accordance with the 17 PEIS ROD and Oregon EIS Rod – September 1, 2011 update.
- National Seed Strategy (August 2015).

Section 7 Consultation
No threatened or endangered species were identified in the official species lists generated by FWS offices within the fire perimeter; two candidate species, sage-grouse and Columbia spotted frog (*Rana luteiventris*) are found within the fire perimeter. Formal consultation is currently not required for species within the fire perimeter; although coordination with FWS will continue for candidate species.

Monitoring

Monitoring objectives for the multiple treatments occurring the first year will be developed by an interdisciplinary team prior to the first growing season. Monitoring is crucial to quantifying the success of treatment objectives as well as the success of treatment implementation. Monitoring results will feed back into the next step of implementation planning, allowing for re-treatment of areas with unfavorable results and adjustment of treatment methods to increase their success. First-year broad-scale stabilization treatments will be followed by more site-specific rehabilitation treatments for needs that have been identified in monitoring data and analyses. Continued monitoring and subsequent treatments over the next 3-5 years will contribute to successful habitat restoration for the greater sage-grouse and other wildlife species in the area, the protection of cultural resources, future livestock use, and all other resource values that have been affected by the wildfire disturbance and other previous disturbances in the area.

All monitoring efforts will use established and approved protocols with enough replicates to detect differences among treatment plots. Permanent exclosures at least five acres in size will be established throughout the fire. Monitoring and research needs will be combined as the opportunities exist to allow for short- and long-term understanding of treatment methods, weather, etc. leading to improved treatment methods in the future.

POST FIRE RECOVERY ISSUES

EMERGENCY STABILIZATION
Emergency Stabilization Objectives: "Determine the need for and to prescribe and implement emergency treatments to minimize threats to life or property or to stabilize and prevent unacceptable degradation to natural and cultural resources resulting from the effects of a fire." 620DM3.4

Emergency Stabilization Priorities: 1) Human life and safety, 2) Property and unique biological habitat (designated critical habitat for federal and state listed, proposed or candidate threatened and endangered species) and 3) Significant heritage sites. 620DM3.7

ES Issues:
ES Issue 1 - Human Life and Safety
ES Issue 2 - Soil/Water Stabilization
ES Issue 3 - Habitat for Threatened and Endangered Species
ES Issue 4 - Cultural Heritage Resources
ES Issue 5 - Noxious Weeds and Invasive Species

BURNED AREA REHABILITATION

Burned Area Rehabilitation Objectives 1) To evaluate actual and potential long-term post-fire impacts to critical cultural and natural resources and identify those areas unlikely to recover naturally from severe wildland fire damage, 2) to develop and implement cost-effective plans to emulate historical or pre-fire ecosystem structure, function, diversity, and dynamics consistent with approved land management plans, or if that is infeasible, then to restore or establish a healthy, stable ecosystem in which native species are well represented, and 3) to repair or replace minor facilities damaged by wildland fire. 620DM3.4

Burned Area Rehabilitation Priorities

1) To repair or improve lands damaged directly by a wildland fire; and 2) To rehabilitate or establish healthy, stable ecosystems in the burned area. 620DM3.8

BAR Issues:

BAR Issue 1 – Lands Unlikely to Recover Naturally
BAR Issue 2 – Noxious Weeds and Invasive Species
BAR Issue 3 – Tree Planting
BAR Issue 4 – Repair or Replace Fire Damaged Facilities

OTHER IMMEDIATE SUPPORTING ACTIONS

Fire Suppression Issues: FIRE 1 – Fire Suppression Damage
Fuels Reduction Issues: FUELS 1 – Fuels Reduction Treatments

Cost Tables

Idaho Cost Tables

Cost Table: Emergency Stabilization

Spec #	Spec #_Treatment / Action	Type of Units	# of Units	Unit Cost	ES FY15	ES FY16	ES FY17	ES FY18	ES SUBTOTAL
S1_R1	Planning (Plan Prep District Overhead)	WM	60	9,783	200,000	118,000	-	-	318,000
S1_R1	Planning (Soda ESR Team)	WM	165	8,455	-	643,000	-	-	643,000
S2_R2	Herbicide Application	AC	123,374	20	558,000	919,000	912,000	-	2,389,000
S2_R2	Ground Seeding (Drill)	AC	56,317	106	1,435,000	2,491,000	1,598,000	-	5,524,000
S3_R3	Aerial Seeding Grass	AC	101,691	100	4,749,000	3,494,000	1,578,000	-	9,821,000
S3_R3	Aerial Seeding Shrub/Forb	AC	235,742	74	3,209,000	6,430,000	4,186,000	-	13,825,000
S4_R4	Seedling Planting (Shrub/Tree)	EA	2,450,000	1.66	-	903,000	754,000	-	1,657,000
S5_R5	Weed Treatments	AC	898,195	0.67	-	148,000	-	-	148,000
S7_R7	Fence/Gate/Cattleguards	MI	400	6,255	-	2,386,000	-	116,000	2,502,000
S8_R8	Road/Trail Water Diversion	MI	28	4,107	-	115,000	-	-	115,000
S9_R9	Cultural Protection (Stabilization/Patrol)	AC	1300	192	-	219,000	30,000	-	249,000
S11_R11	Facilities/Improvements	EA	250	200	-	50,000	-	-	50,000
S12_R12	Closures (area, OHV, livestock)	EA	36	2,750	-	47,000	-	-	47,000
S13_R13	Monitoring (Treatments, Grazing Resumption, AIM	AC	179,639	21	-	947,000	587,000	587,000	2,121,000
S14_R14	Other Treatments (FIRE SUPPRESSION DAMAGE	MI	90	1022	-	-	-	-	-
S14_R14	Other Treatments FUELS	AC	11,065	*660*					-
S14_R14	Other Treatments - HAZARDOUS MATERIAL REMOVAL SQUAW CREEK				350,000	18,000	-	-	368,000
S14_R14	Other Treatments - ABANDON MINE CLOSURES SHAFTS AND ADITS				-	51,000	-	-	51,000
S14_R14	Other Treatments - WILD HORSE GATHER				369,000	-	-	-	369,000
	TOTAL BAR & Seed				10,870,000	18,979,000	9,645,000	703,000	40,197,000
	TOTAL Seed Only				8,861,000	6,576,000	5,194,000	-	20,631,000

Cost Table: Burned Area Rehabilitation

Spec #	Spec #_Treatment / Action	Type of Units	# of Units	Unit Cost	BAR FY16	BAR FY17	BAR FY18	BAR FY19	BAR FY20	BAR SUBTOTAL
S1_R1	Planning (Plan Prep District Overhead)	WM	60	9,783	-	98,000	73,000	50,000	48,000	269,000
S1_R1	Planning (Soda ESR Team)	WM	165	8,455	-	212,000	180,000	180,000	180,000	752,000
S2_R2	Herbicide Application	AC	123,374	20	-	-	37,000	-	-	37,000
S2_R2	Ground Seeding (Drill)	AC	56,317	106	-	-	424,000	-	-	424,000
S3_R3	Aerial Seeding Grass	AC	101,691	100	-	-	359,000	-	-	359,000
S3_R3	Aerial Seeding Shrub/Forb	AC	235,742	74	-	-	3,710,000	-	-	3,710,000
S4_R4	Seedling Planting (Shrub/Tree)	EA	2,450,000	1.66	-	541,000	1,210,000	665,000	-	2,416,000
S5_R5	Weed Treatments	AC	898,195	0.67	-	145,000	135,000	106,000	68,000	454,000
S7_R7	Fence/Gate/Cattleguards	MI	400	6,255	-	-	-	-	-	-
S8_R8	Road/Trail Water Diversion	MI	28	4,107	-	-	-	-	-	-
S9_R9	Cultural Protection (Stabilization/Patrol)	AC	1300	192	-	-	-	-	-	-
S11_R11	Facilities/Improvements	EA	250	200	-	-	-	-	-	-
S12_R12	Closures (area, OHV, livestock)	EA	36	2,750	-	26,000	26,000	-	-	52,000
S13_R13	Monitoring (Treatments, Grazing Resumption, AIM	AC	179,639	21	-	-	100,000	587,000	947,000	1,634,000
S14_R14	Other Treatments (FIRE SUPPRESSION DAMAGE	MI	90	1022	-	-	-	-	-	-
S14_R14	Other Treatments FUELS	AC	11,065	*660*	*0*	*0*				-
S14_R14	Other Treatments - HAZARDOUS MATERIAL REMOVAL SQUAW CREEK				-	-	-	-	-	-
S14_R14	Other Treatments - ABANDON MINE CLOSURES SHAFTS AND ADITS				-	-	-	-	-	-
S14_R14	Other Treatments - WILD HORSE GATHER				-	-	-	-	-	-
	TOTAL BAR & Seed				-	810,000	6,074,000	1,408,000	1,063,000	9,355,000
	TOTAL Seed Only				-	-	3,744,000	-	-	3,744,000

Cost Table: Fuels/Fire Suppression

Spec #	Spec #_Treatment / Action	Type of Units	# of Units	Unit Cost	FUELS FY16	FUELS FY17	FUELS FY18	FUELS FY19	FUELS FY20	FUELS SUBTOTAL	FIRE SUPPRESSION	Total Costs
S1_R1	Planning (Plan Prep District Overhead)	WM	60	9,783								587,000
S1_R1	Planning (Soda ESR Team)	WM	165	8,455								1,395,000
S2_R2	Herbicide Application	AC	123,374	20								2,426,000
S2_R2	Ground Seeding (Drill)	AC	56,317	106								5,948,000
S3_R3	Aerial Seeding Grass	AC	101,691	100								10,180,000
S3_R3	Aerial Seeding Shrub/Forb	AC	235,742	74								17,535,000
S4_R4	Seedling Planting (Shrub/Tree)	EA	2,450,000	1.66								4,073,000
S5_R5	Weed Treatments	AC	898,195	0.67								602,000
S7_R7	Fence/Gate/Cattleguards	MI	400	6,255								2,502,000
S8_R8	Road/Trail Water Diversion	MI	28	4,107								115,000
S9_R9	Cultural Protection (Stabilization/Patrol)	AC	1300	192								249,000
S11_R11	Facilities/Improvements	EA	250	200								50,000
S12_R12	Closures (area, OHV, livestock)	EA	36	2,750								99,000
S13_R13	Monitoring (Treatments, Grazing Resumption, AIM	AC	179,639	21								3,755,000
S14_R14	Other Treatments (FIRE SUPPRESSION DAMAGE	MI	90	1022							92,000	92,000
S14_R14	Other Treatments FUELS	AC	11,065	*660*	4,680,000	1,843,000	347,964	347,964	80,394	7,299,000		7,299,000
	Inside fire perimeter (Subtotal)		*2,844*	*580*	363,000	510,000	347,964	347,964	80,394	1,649,000		1,649,000
	Outside Fire Perimeter (Subtotal)		8,221	687	4,317,000	1,333,000	-	-	-	5,650,000		5,650,000
S14_R14	Other Treatments - HAZARDOUS MATERIAL REMOVAL SQUAW CREEK											368,000
S14_R14	Other Treatments - ABANDON MINE CLOSURES SHAFTS AND ADITS											51,000
S14_R14	Other Treatments - WILD HORSE GATHER											369,000
				TOTAL BAR & Seed	4,680,000	1,843,000	347,964	347,964	80,394	7,299,000	92,000	56,943,000
				TOTAL Seed Only	167,200	574,050	167,200	167,200	-	1,075,850	-	25,450,850

Cost Table: Idaho Total Costs

Spec #	Spec #_Treatment / Action	Type of Units	# of Units	Unit Cost	Total Costs
S1_R1	Planning (Plan Prep District Overhead)	WM	60	9,783	587,000
S1_R1	Planning (Soda ESR Team)	WM	165	8,455	1,395,000
S2_R2	Herbicide Application	AC	123,374	20	2,426,000
S2_R2	Ground Seeding (Drill)	AC	56,317	106	5,948,000
S3_R3	Aerial Seeding Grass	AC	101,691	100	10,180,000
S3_R3	Aerial Seeding Shrub/Forb	AC	235,742	74	17,535,000
S4_R4	Seedling Planting (Shrub/Tree)	EA	2,450,000	1.66	4,073,000
S5_R5	Weed Treatments	AC	898,195	0.67	602,000
S7_R7	Fence/Gate/Cattleguards	MI	400	6,255	2,502,000
S8_R8	Road/Trail Water Diversion	MI	28	4,107	115,000
S9_R9	Cultural Protection (Stabilization/Patrol)	AC	1300	192	249,000
S11_R11	Facilities/Improvements	EA	250	200	50,000
S12_R12	Closures (area, OHV, livestock)	EA	36	2,750	99,000
S13_R13	Monitoring (Treatments, Grazing Resumption, AIM	AC	179,639	21	3,755,000
S14_R14	Other Treatments (FIRE SUPPRESSION DAMAGE	MI	90	1022	92,000
S14_R14	Other Treatments FUELS	AC	11,065	*660*	7,299,000
S14_R14	Other Treatments - HAZARDOUS MATERIAL REMOVAL SQUAW CREEK				368,000
S14_R14	Other Treatments - ABANDON MINE CLOSURES SHAFTS AND ADITS				51,000
S14_R14	Other Treatments - WILD HORSE GATHER				369,000
			TOTAL BAR & Seed		56,943,000
			TOTAL Seed Only		25,450,850

Oregon Cost Tables

Cost Table: Emergency Stabilization

Spec #	Spec #_Treatment / Action	Type of Units	# of Units	Unit Cost	ES FY15	ES FY16	ES FY17	ES FY18	ES SUBTOTAL
S2_R2	Herbicide Application	AC	51,137	46	1,089,000	1,247,000	34,000	-	2,370,000
S2_R2	Ground Seeding (Drill)	AC	4,215	160	-	105,000	569,000	-	674,000
S4_R4	Seedling Planting (Shrub/Tree)	EA	94,000	2.68	-	-	-	-	-
S5_R5	Weed Treatments	AC	15,000	3.33	-	25,000	-	-	25,000
S7_R7	Fence/Gate/Cattleguards	MI	17	16,118	-	103,000	-	21,000	124,000
S9_R9	Cultural Protection (Stabilization/Patrol)	EA	40	850	-	34,000	-	-	34,000
S11_R11	Facilities/Improvements	EA	7	5000	-	35,000	-	-	35,000
S12_R12	Closures (area, OHV, livestock)	EA	4	4,250	-	10,000	7,000	-	17,000
S13_R13	Monitoring (Treatments, Grazing Resumption, AIM	AC	46,314	43	-	400,000	400,000	-	800,000
S14_R14	Other FUELS (Total)	AC	*5,287*	*870*					-
	Inside fire perimeter (Subtotal)	AC	*1,675*	*530*					-
	Outside Fire Perimeter (Subtotal)	AC	3,612	1028					-
S14_R14	OTHER WILD HORSE GATHER				-	100,000	-	-	100,000
TOTAL ES, BAR, FUELS & SEED					1,089,000	2,059,000	1,010,000	21,000	4,179,000
TOTAL Seed Only					-	-	401,000	-	401,000

Cost Table: Burned Area Rehabilitation

Spec #	Spec #_Treatment / Action	Type of Units	# of Units	Unit Cost	BAR FY16	BAR FY17	BAR FY18	BAR FY19	BAR FY20	BAR SUBTOTAL
S2_R2	Herbicide Application	AC	51,137	46	-	-	-	-	-	-
S2_R2	Ground Seeding (Drill)	AC	4,215	160	-	-	-	-	-	-
S4_R4	Seedling Planting (Shrub/Tree)	EA	94,000	2.68	-	148,000	104,000	-	-	252,000
S5_R5	Weed Treatments	AC	15,000	3.33	-	16,000	9,000	-	-	25,000
S7_R7	Fence/Gate/Cattleguards	MI	17	16,118	-	150,000	-	-	-	150,000
S9_R9	Cultural Protection (Stabilization/Patrol)	EA	40	850	-	-	-	-	-	-
S11_R11	Facilities/Improvements	EA	7	5000	-	-	-	-	-	-
S12_R12	Closures (area, OHV, livestock)	EA	4	4,250	-	-	-	-	-	-
S13_R13	Monitoring (Treatments, Grazing Resumption, AIM	AC	46,314	43	-	-	400,000	400,000	400,000	1,200,000
S14_R14	Other FUELS (Total)	AC	*5,287*	*870*						-
	Inside fire perimeter (Subtotal)	AC	*1,675*	*530*	-	-				-
	Outside Fire Perimeter (Subtotal)	AC	3,612	1028	-	-				-
S14_R14	OTHER WILD HORSE GATHER				-	-	-	-	-	-
TOTAL ES, BAR, FUELS & SEED					-	314,000	513,000	400,000	400,000	1,627,000
TOTAL Seed Only					-	-	-	-	-	-

Cost Table: Fuels Reduction

Spec #	Spec #_Treatment / Action	Type of Units	# of Units	Unit Cost	FUELS FY16	FUELS FY17	FUELS FY18	FUELS FY19	FUELS FY20	FUELS SUBTOTAL
S2_R2	Herbicide Application	AC	51,137	46						
S2_R2	Ground Seeding (Drill)	AC	4,215	160						
S4_R4	Seedling Planting (Shrub/Tree)	EA	94,000	2.68						
S5_R5	Weed Treatments	AC	15,000	3.33						
S7_R7	Fence/Gate/Cattleguards	MI	17	16,118						
S9_R9	Cultural Protection (Stabilization/Patrol)	EA	40	850						
S11_R11	Facilities/Improvements	EA	7	5000						
S12_R12	Closures (area, OHV, livestock)	EA	4	4,250						
S13_R13	Monitoring (Treatments, Grazing Resumption, AIM	AC	46,314	43						
S14_R14	Other FUELS (Total)	AC	*5,287*	*870*	2,288,000	66,000	2,245,800	-	-	4,600,000
	Inside fire perimeter (Subtotal)	AC	*1,675*	*530*	290,000	21,000	576,800	-	-	888,000
	Outside Fire Perimeter (Subtotal)	AC	3,612	1028	1,998,000	45,000	1,669,000	-	-	3,712,000
S14_R14	OTHER WILD HORSE GATHER									
TOTAL ES, BAR, FUELS & SEED					2,288,000	66,000	2,245,800	-	-	4,600,000
TOTAL Seed Only					264,350	-	110,000	-	-	374,600

Cost Table: Oregon Total Costs

Spec #	Spec #_Treatment / Action	Type of Units	# of Units	Unit Cost	Total Costs
S2_R2	Herbicide Application	AC	51,137	46	2,370,000
S2_R2	Ground Seeding (Drill)	AC	4,215	160	674,000
S4_R4	Seedling Planting (Shrub/Tree)	EA	94,000	2.68	252,000
S5_R5	Weed Treatments	AC	15,000	3.33	50,000
S7_R7	Fence/Gate/Cattleguards	MI	17	16,118	274,000
S9_R9	Cultural Protection (Stabilization/Patrol)	EA	40	850	34,000
S11_R11	Facilities/Improvements	EA	7	5000	35,000
S12_R12	Closures (area, OHV, livestock)	EA	4	4,250	17,000
S13_R13	Monitoring (Treatments, Grazing Resumption, AIM	AC	46,314	43	2,000,000
S14_R14	Other FUELS (Total)	AC	*5,287*	*870*	4,600,000
	Inside fire perimeter (Subtotal)	AC	*1,675*	*530*	888,000
	Outside Fire Perimeter (Subtotal)	AC	3,612	1028	3,712,000
S14_R14	OTHER WILD HORSE GATHER				100,000
				TOTAL ES, BAR, FUELS & SEED	10,406,000
				TOTAL Seed Only	856,600

Treatments

The following sections describe the proposed set of actions to be implemented for stabilization and rehabilitation efforts on the Soda fire. The treatments proposed are broken out into two sections: Idaho and Oregon. Although treatments for the Soda fire are based as a landscape approach, it was found that separation between the two states was required for ease to the reader. The Emergency Stabilization and Rehabilitation program (ESR) is expanding to include treatments for up to five years following a wildfire. This expansion will allow treatments to be evaluated and modified as needed to maximize treatment success and allow for multiple treatments over multiple years. Additional restoration treatments and re-treatments will be determined by the response of these first stabilizing treatments allowing for new ideas and treatments to be added. Resource-specific identification of the values-at-risk and associated threats supports the proposed treatments. Other treatments have also been identified within the project record, however, for reasons of timing, or a need for further analysis those actions are not yet being proposed for implementation.

The scale of the Soda fire and the scope of its impacts necessitate implementation of a suite of coordinated treatments across the landscape. Even moderate treatment success in areas with limited access (steep rocky terrain, lack of roads etc.) will hasten the recovery of the burned area. There are few unburned islands of vegetation remaining to serve as seed sources to re-establish native vegetation within the fire perimeter, especially on the east side of the fire.

Treatment polygons and fuel breaks displayed on plan maps may cross private, state, and other land ownership; however treatments described within the plan refer to BLM lands only. Coordination between BLM, private, state and other land owners will occur for possible joint treatments. Treatments shown on ownership other than BLM are for illustrative purposes only.

Provisional seed zones were used in the development of seed mixes; suggested species were purchased when they were available and feasible.

The actions are grouped into the following categories:

- **Emergency Stabilization (ES):** actions critical to stabilizing or protecting values at risk. These actions usually occur within the first year but may extend into the second fall planting season after a wildfire to maximize opportunities for success.
- **Rehabilitation (BAR):** actions moving toward a resistant and resilient situation to reduce or eliminate threats to values. These actions could occur for up to five years from the wildfire ignition date.
- **Restoration** actions begin with stabilization or rehabilitation actions, but will likely require a secondary step (Future Projects). These actions create a healthy, resilient condition in which native species are well represented, and facilitates the return of natural ecological cycles.

Treatments have been identified according to the ESR plan format to aid in organizing, tracking, and plan input into ESRS software.

ES Treatment Categories

S2 Ground Seeding
S3 Aerial Seeding
S4 Seedling Planting
S5 Noxious Weeds
S6 Soil Stabilization
S7 Fence/Gate/Cattleguard
S8 Road/Trail Water Diversion
S9 Cultural Protection
S10 Tree Hazard Removal
S11 Facilities
S12 Closures (Area, OHV, Livestock)
S13 Monitoring
S14 Other Treatments

BAR Treatment Categories

R2 Ground Seeding
R3 Aerial Seeding
R4 Seedling Planting
R5 Noxious Weeds
R6 Soil Stabilization
R7 Fence/Gate/Cattleguard
R8 Road/Trail Water Diversion
R9 Cultural Protection
R10 Tree Hazard Removal
R11 Facilities
R12 Closures (Area, OHV, Livestock)
R13 Monitoring
R14 Other Treatments

Issues and treatments are presented by individual programs and have been organized by the order in which they will be implemented.

IDAHO

Hazardous Materials

Squaw Creek Canyon Tire Dump

The Squaw Creek Canyon Tire Dump (Squaw Creek Tires), located at T1N R4W Section 19 & 20, is a known solid waste dumpsite consisting of an estimated 600 tires, junk cars, appliances, empty drums, and scrap metal in a canyon with steep slopes and limited vehicular access. At the time of the Soda fire the site was awaiting funding through the BLM Special Clean-up Fund (SCF) for removal of solid waste (estimated cost of $154,000).
The Soda fire moved through the area on approximately August 12, 2015. The fire burned off nearly all the vegetation from the canyon exposing an additional approximately 150 tires. Based on ground observations it is estimated that approximately two-thirds of the tires and all of the vehicles, appliances, and scrap metal burned as a result of the Soda fire.

Tires break down into hazardous compounds including gases, heavy metals, and oil. The average passenger car tire is estimated to produce over two gallons of oil when burned. (Source: Rubber Manufacturers Association, April 2003). Oil that seeps into ground and surface water as a result of tire fires is a significant environmental pollutant. The Squaw Creek tires, burned and unburned, are spread through the canyon occurring in both medium-large concentrations and as singles, on either side of and within the creek. Many of the larger concentrations of both burned and unburned tires are located up slope of the riparian area within drainages. During rainfall events these areas will channel water through the tires and into the Squaw Creek down gradient.

Treatments

S14 (Other Treatments) Hazardous Material Removal; ES Issue 1 - Human Life and Safety

Due to the size of the watershed and the direct connection between Squaw Creek and the Snake River it is recommended that the burned and unburned tires and all related materials be removed expeditiously. Heavy rainfall has the potential to move contaminates from up-land areas into the creek and off site; re-vegetation prior to clean up would make locating all of the burned tires nearly impossible.

The BLM Emergency Response Contractor has provided a phased estimate for removal of the tires, large trash, and contaminated soils. This estimate considers the labor intensive nature of gathering dispersed tires, excavating soil from steep terrain, and use of a helicopter.

- **Phase 1**: Sampling of soils beneath burned tires to categorize waste stream. Removal of all tires and contaminated soils from within the riparian area. Disposal of tire remains and contaminated soils. Installation of erosion fence along the riparian corridor to mitigate stream impacts during work and pre-seeding. Anticipate two weeks to complete.
- **Phase 2**: Removal of all burned tire remains and contaminated soils in up-slope area outside the riparian area. Disposal of tire remains and contaminated soils. Anticipate three weeks to complete.
- **Phase 3**: Removal and disposal (recycle) of all intact tires and all metal debris within the Squaw Creek project site. Anticipate two weeks to complete.

If Phases 2 and 3 are not completed in a timely manner (i.e. before re-vegetation and/or rains) Phase 1 will be undermined and have been for naught.

S3 Aerial Seeding; ES Issue 2 - Soil/Water Stabilization
Aerial seeding of Squaw Creek is covered in the Riparian and Aquatics section

S4 Seedling Planting, S6 Soil Stabilization; ES Issue 2 - Soil/Water Stabilization
Plant woody species and install erosion control material or structures as needed after hazardous material removal to ensure soil stabilization. Evaluation after contractor has completed clean–up will determine the type and number of structures needed.

S7 Fence; ES Issue 1 - Human Life and Safety
Three miles of three strand barbed wire fence, bottom smooth, with steel post or steel rock jack corners will be constructed to block vehicle access to canyon rim to prevent items from being pushed into the canyon in the future. Fence will be built such that it will not trap livestock or wild horses.

S13 Monitoring; ES Issue 1 – Human Life and Safety
The Squaw Creek Tire Hazardous Material removal treatments will require ongoing monitoring.

Mac D Mercury Mine and Retort Site

The Mac D Mercury Mine & Retort Site (Mac D), located at T2N R5W Section 6, consists of a newly installed soil cap over mercury contaminated soils; the cap is surrounded by a three-strand barbed wire fence. At the time of the Soda fire the site was pending fall seeding to establish vegetation cover on the newly installed cap. The fire burned off nearly all vegetation surrounding the Mac D Mercury Mine & Retort Site. The fence and soil cap were undamaged. However, the loss of vegetation increases the potential for even more common rainfall events to result in increased overland flow over the soil cap leading to erosional processes jeopardizing the integrity of the cap.

Treatments

S6 Soil Stabilization; ES Issue 1 - Human Life and Safety
Install water bars in road upstream of the Mac D site to slow and/or divert water away from the site. Monitor after each rain event to ensure diversions are holding and no erosion occurring.

S13 Monitoring; ES Issue 1 - Human Life and Safety
The Mac D treatments will require ongoing monitoring. A seasonal/temporary staff would be a cost savings over using permanent full-time employees and reduce impacts to already heavy workloads.

Jordan Creek Rollover Site

A vehicle associated with the suppression effort rolled into Jordan Creek on August 18, 2015. A Forest Service Law Enforcement Officer, assigned to the Soda fire, and an Owyhee County Sheriff responded and the vehicle was removed later that day.

Treatments

S13 Monitoring; ES Issue 1 - Human Life and Safety
The Boise District Hazardous Materials staff will monitor the site periodically for six months through autumn rainy season to see if any sheen appears from fluids possibly trapped in sediments. If oil resurfaces remediate as necessary with sorbent pads.

Minerals, Geology and Abandoned Mine Lands (AML)

Over 35 mines, prospects, gravel pits, and community pits were visited during field reconnaissance following the Soda fire. The identified features were largely unchanged by fire activity, with the major exception of loss of vegetative cover increasing the visibility and accessibility to hazardous features. Visitation to hazardous AML features will increase due to increased visibility and accessibility. While incidents at mine workings are rare, the likelihood increases with the increased visitation. Incidents are usually catastrophic with severe injuries or death as likely outcomes. Vandalism of mine workings reduces their structural integrity. Increased visitation degrades access roads and trails.

Mine workings provide habitat for many species. Most commonly the species of concern are bats, wood rats, and snakes. Increased visitation will increase the probability of the introduction of disease (White Nose Syndrome) and potential disruption of day roosts, winter hibernacula, and active maternity colonies.

Treatments

S14 (Other) Closure of Shafts and Adit; ES Issue 1 - Human Life and Safety

Remediation of the physical safety hazards associated with two shafts and two adits located within the Soda fire perimeter will mitigate the potential for physical harm and vandalism. Making roads and trails inaccessible will also mitigate potential for vandalism. The following shaft and adit closures will be completed:

- S1 & S2 Shaft. Identified as "collapsed shaft"; backfill using backhoe or excavator with waste rock dump material and dirt/rock adjacent to mine opening. Approximately 50 feet of access trail will be constructed to the shaft site for closure work and will be rehabilitated when equipment leaves the site.
- A1 & A2 Adit. Identified as "open adit"; install bat-friendly grate with lockable bar.

S7 Fence; ES Issue 1 - Human Life and Safety

Construct 350 feet of new permanent fence along the west side of Stewart Gulch road toward Upper Stewart Spring. The loss of vegetation has resulted in a need for additional fencing to restrict access to the largest open adit within the fire perimeter preventing vehicle movement around the gate and into unsafe mine areas.

S14 Hazardous Waste Removal; ES Issue 1 - Human Life and Safety

Remove Mason jar with unknown substance discovered at west adit and dispose of properly. This will be coordinated by Boise District Hazardous Materials Specialist.

R11 Facilities; BAR Issue 4 - Repair or Replace fire Damaged Facilities

Replace two fire damaged signs at the Flat Top Community Pit.

Transportation Infrastructure and Safety

The watersheds within the fire are now in a condition that will generate larger stream and debris flows following precipitation events due to the loss of live vegetation on both the hillslopes and within riparian areas in the drainage bottoms. The increased flows will move more debris and may threaten human life and safety at road/stream crossings and could lead to road damage requiring significant expense to repair. Following increased flows, ford crossings would have limited road damage as the debris can pass through the crossing sites. Many areas have a rocky soil type that will be more resistant to erosion and road surface loss.

There is an extreme risk to human life and safety resulting from increased flows from burned watersheds. Injury or death can result from flash floods at road/stream crossings or from hazards such as rolling rocks and road fill slope washouts caused by post fire storms.

The watersheds that burned in the Soda fire will show the effects of the fire via increased runoff rates, erosion, sediment, and debris transport creating a future concern for roads, culverts, and channels along the drainage paths of the burned watersheds in that they may be plugged, overtopped or washed away more frequently than in its pre-fire condition. The value of infrastructure is at a high risk for significant damage from these post-fire effects.

The Sands Basin Road #3701 has steep climbing grades with a large spacing distance between ditch relief culverts that will be unable to handle post-fire flows without damage to the ditchlines and fill slopes. The McBride Creek Road # 3705 has several drainage crossings with through fills that would be expensive to repair if damaged during a post-fire flood event. Post-fire flow estimates show that the culverts in some of the stream crossings on these roads are undersized and the roads will likely be impacted by water overtopping and the subsequent loss of road segments.

Treatments

S8 Road/Trail Water Diversion; ES Issue 1 - Human Life and Safety

- Clean culverts, ditches, and catchment basins of sediment and debris. Replace nine damaged or plugged ditch relief culverts and install nine new culverts in locations that will increase the number of drain points to reduce the flow in existing ditchlines.
- Grade 27.3 miles of road template to efficiently direct runoff to the nearest drainage structure (culverts and leadout ditches) to prevent long runs down the roadway that will result in surface and road fill loss.
- Place riprap below two culvert sites to minimize erosion and stabilize the fill slopes.
- Repair a portion of the retaining wall that burned along the concrete ramp at the Jump Creek Recreation Site.
- Replace existing culverts which will not pass predicted post fire flows with culverts of larger diameter with increased flow capacity. There are thirteen culverts recommended to be upgraded in size.
- Install warning signs to alert the public to the hazards associated with post fire conditions and locate the signs at major entry points to the fire.
- Patrol transportation system for early detection of problems. Timely repair will reduce the damage to the road structure and will provide for increased public safety.

Watershed Response-Hydrology

The Soda fire burned 227,144 acres of sloping rangeland and pastureland located near the north end of the Owyhee Mountains. The fire took place within lands managed by private land owners, the State of Idaho, State of Oregon, and the DOI Bureau of Land Management. The burn area includes a portion of the Reynolds Creek Experimental Watershed (RCEW) maintained by the USDA Agricultural Research Service (ARS). Water resources in the burn area primarily contribute to irrigation, livestock production, fisheries, recreation, and wildlife habitat.

Precipitation data for the general area are available from the USDA-ARS precipitation gage network in the RCEW. The majority of precipitation falls during the cool periods of the year. Average annual precipitation ranges from 6 inches at valley locations (3,000 ft elevation, < 20% as snow) to more than 20 inches at higher elevations (6,000 ft, > 60% as snow; Hanson 2000). High-intensity storm events are infrequent and occur primarily during summer months.

The majority of runoff from streams occurs during the spring snowmelt period (Mar-May), with isolated peaks occurring during rain-on-snow events. The highest flows on record were primarily generated by winter rain-on-snow or rain-on-frozen soil events (Pierson et al. 2000). Flooding from convective summer thunderstorms has occurred from unburned watersheds in the area. Therefore, runoff from convective storms in the burn may pose concerns for life, property, and resources. Annual watershed (8,000 to 57,750 ac) sediment yields in RCEW average 0.5 to 0.8 t/ac and generally increase with increasing drainage area. Large runoff events account for most of the annual sediment delivery, with sediment concentrations generally several orders of magnitude lower during low flows (Pierson et al. 2000).

The primary hydrologic concerns are increased runoff and sediment delivery associated with fire removal of vegetation from sloping rangelands. The first order effect is an increase in water availability for runoff due to decreased interception and surface water detention. Soils in the area are prone to soil water repellency pre- and post-fire (Pierson et al. 2008). Vegetation and ground cover buffer effects of repellency on infiltration and reduce the energy of precipitation and overland flow where it occurs. Reduced infiltration and surface water retention facilitate runoff and extensive bare ground facilitates formation of high velocity concentrated flow (Pierson et al. 2011; Williams et al. 2015). High velocity flow in the post-burn environment is capable of detaching and transporting high amounts of readily available sediment to stream channels. Higher in-channel flows are capable of transporting amplified sediment loads downstream. Amplified streamflows and the associated sediment delivery potentially pose hazards to infrastructure, property, and human life (Williams et al. 2014a).

A soil erosion risk map for the Soda fire was derived based on the Burned Area Reflectance Classification (BARC) map, slope steepness, and soil erodibility factors in the local soil survey. Burn severity was low to moderate across most of the Soda fire. Slopes in the area are gentle (< 20%) near the valley floor, but commonly exceed 30% in the uplands. Overall, the likelihood for runoff to concentrate and transport high sediment loads is strongly correlated with the amount of discharge, percent bare soil, and slope steepness (Al-Hamdan et al. 2013). Runoff and erosion are generally highest where bare soil exceeds 50-60% (Williams et al. 2014a). Erosion potential is strongly related to the inherent and fire-induced soil erodibility and availability (Al-Hamdan et al. 2012; Williams et al. 2014a). The erosion risk map captures most of these variables and provides insight into areas of potential soil detachment by rainfall and overland flow.

Threats to all values are increases to peak flow rates and sediment delivery due to the loss of vegetation during the Soda fire. Most of the area that the Soda fire occurred on was already a concern for flash flooding, with a great degree of the vegetation consumed by the fire it will take less rainfall to generate flooding.

This section of the Soda fire ESR report included expert local knowledge backed up by decades of research conducted by the ARS who operate the RCEW which partially burned in the Soda fire. Qualitative hydrologic modeling was used to determine areas more prone to the risks associated with post-fire rainfall response. Expert local knowledge was utilized to check the modeling results. This served to verify that the magnitudes of change predicted by the modeling effort were reasonable, but that the absolute values produced are not reasonable. This was anticipated as the scheme for rapid assessment of burned watersheds does not include model calibration and the method used to assess risk throughout entire watersheds includes applying rainfall to entire watersheds. This is not realistic for the short duration, high intensity type storms that present the greatest risk for post-fire flooding and will therefore lead to unrealistic rainfall response.

Succor Creek Reservoir - The Succor Creek reservoir is expected to receive more water and sediment as a result of increased runoff from the surrounding burned area. The reservoir should have plenty of capacity to hold the

increase in water without threatening the dam infrastructure. Increases in sediment are of concern for water quality. Rangeland treatments such as seeding of upland areas will help mitigate the sedimentation of this reservoir. Further treatment is not practical for the risk posed to this value.

Road Crossings Throughout and Adjacent to the Burned Area - There are several road crossings in poor shape with undersized culverts for unburned conditions. It is recommended that several culverts be upsized for anticipated increases to peak runoff rates and sediment delivery. In addition signs warning road users about the dangers of driving through a burned area, especially during flow inducing events, should be installed.

Treatments

The following treatments will be needed to address overland flow/hydrological function issues and concerns, although the descriptions for the resource the treatment most directly refers to:

S2 Ground Seeding; ES Issue 2 - Soil/Water Stabilization
ES Issue 3 – Habitat for Threatened and Endangered Species
ES Issue 5 - Noxious Weeds and Invasive Species

Ground seeding is described in Treatments in the Wildlife section.

S3 Aerial Seeding; ES Issue 2 - Soil/Water Stabilization
ES Issue 3 – Habitat for Threatened and Endangered Species
ES Issue 5 - Noxious Weeds and Invasive Species

Aerial grass seeding of uplands, riparian areas, springs and seeps for stabilization is described in Treatments in the Wildlife section.

S8 Road/Trail Water Diversion; ES Issue 1 - Human Life and Safety

Road maintenance and signage is described in the Transportation Infrastructure and Safety section.

Riparian and Aquatics

The values at risk identified for aquatics include perennial and intermittent stream channels (lotic systems), reservoirs and lakes (lentic systems), and aquatic species. The fire effects on stream channels and lentic systems impact the aquatic species present, which are identified as inland redband trout (*Oncorhynchus mykiss gairdneri*) a BLM Type 2 special status species, Columbia spotted frog an ESA federal candidate species, and macroinvertebrates.

Fire may result in a large array of direct and indirect effects to aquatic species and riparian habitats. Direct effects to aquatic populations will generally occur in riparian areas where burn intensity was high. These areas are typically denuded of all vegetation and, during the fire, could have experienced increased water temperatures, decreased oxygen availability, and ash loading into streams. Since some of the drainages burned very hot, aquatic species may have died as a result. Due to the decomposition rate of these species, it is often difficult to determine the extent of such extirpation events.

Lotic systems are at risk for having increased stream channel alterations as a result of vegetation loss along the riparian corridor and in the up-lands, changes in water chemistry due to ash delivery, changes in water temperature from loss of canopy shading, scouring of riparian/aquatic vegetation, changes in pool habitat due to geomorphic bed movement, sediment delivery and flushing of species during flood events downstream.

Lentic systems are at risk of drying from loss of vegetative cover that maintains soil moisture, sedimentation and erosion from overland flow events, degradation of water quality, reduced ability to maintain water on site and recharge subsurface flows, and authorized uses.

Buffers of 300 feet from perennial and fish bearing intermittent streams are required prior to aerial herbicide treatment.

Treatments

R7 Fence; BAR Issue 4 - Repair or Replace fire Damaged Facilities

- Repair 44 spring exclosures that were damaged by the fire
- Repair approximately 18 miles of riparian exclosure fence that were damaged by the fire

S3 Aerial Seeding; ES Issue 2 - Soil/Water Stabilization

Seed approximately 606 acres in and around riparian areas (lentic and lotic) and areas with deeper soils to out-compete noxious weeds and invasive plant species encroachment, stabilize channel structures, and hydric soil depressions (see Table 1).

Seed approximately 777 acres to re-establish desired vegetation in riparian springs and seeps to out-compete invasive and noxious weeds.

Table 1: Aerial Grass Seeding Mix 5

Soda Aerial Grass Mix 5 Fall 2015 Riparian Corridors and Springs/Seeps	Seeding Acres	Bulk Lbs/ Ac	PLS Lbs/ Ac	% of Mix
Streambank Wheatgrass, Sodar	1,383	6.0	4.8	53%
Basin Wildrye, Trailhead	1,383	6.0	4.6	44%
Triticale	1,383	6.0	4.9	4%
TOTAL	1,383	18.0	14.3	100%

R11 Facilities; BAR Issue 4 - Repair or Replace fire Damaged Facilities

Place approximately 100+ floats and/or shut-off valves on all existing range improvement troughs where missing. Floats and shut-off valves are necessary to enable spring/seep areas to recharge subsurface water patterns and provide water storage on the landscape. Diverting excess water back to the spring/seep source will encourage and support the reestablishment of riparian vegetation either through natural recolonization or planting/seeding efforts.

R4 Seedling Planting; ES Issue 2 – Soil/Water Stabilization

Plant woody species as needed in 13 miles of stream corridor in spring of 2016. Areas will be evaluated in early spring of 2016 to monitor recovery to determine extent of planting.

Future Projects

- New fence exclosures need to be constructed around seven lentic areas that are currently unfenced. This would amount to four miles of fence.
- Increase size of riparian exclosures to five or more acres. Re-establish and expand exclosures around riparian areas to provide for greater riparian vegetation regrowth, provide aquatic and terrestrial wildlife habitat diversity, and reduce the encroachment of noxious weeds and invasive plant species along the margins of these habitats.
- Collection and grow out of local forb seed and planting of forb seedlings in priority areas, due to lack of seed availability for seeding in fall of 2015
- Buffer areas will be evaluated and may be treated with an appropriate herbicide on a case by case basis, using methods other than aerial application, to control annual invasive species and noxious weeds.
- If needed beyond the first year collection and grow out of willow cuttings, and planting of willow whips in priority areas.

For future projects, the rational for minimum riparian exclosure size is as follows: Smaller exclosures tend to inhibit wildlife use due to the obstacles (fences) that must be bypassed in order to use habitat. By expanding exclosures to the minimum allowed or, preferably, to the extent of the riparian area, we are maximizing the amount of habitat both available to and usable by wildlife once the animal has made the initial investment of entering an area. For animals such as sage grouse or aquatic species (Columbia spotted frog), these exclosures also serve as a safe haven where nests and young are protected from outside impacts.

Soils

Field reconnaissance of the Soda fire revealed that most of the burned area soils fell into a moderate to low burn soil severity classification within every region despite the moderate to high fire intensity that was uniformly distributed across most of the burn. Areas with a high burn severity classification were limited to several relatively small and scattered locations, mostly in the central to southern part of the fire. A burn severity rating of an evaluated area was based on 10 to 20 individual hydrophobicity tests across the landscape along with observations of litter remains, vegetative consumption, and ash color.

Soil loss from within the burned area is expected and can cause substantial effects to vegetative recovery and increased energy during large runoff events. Large areas of highly erosive soils are vulnerable to movement or loss during precipitation and wind events for months to years after the fire. Unauthorized motorized vehicle access will likely increase and add to localized soil impacts due to a loss of physical and vegetative screens that previously limited access.

Increased runoff and soil erosion can pose threats to life and property. There are several private residences and/or properties that may be affected by the potentially increased post-fire runoff. The initial flush of ash and soils with reduced stability, combined with the lack of ground cover, is probable over the short-term, especially during a high intensity storm event. The results of the soil assessments, hydrologic modeling, and treatment recommendations will be shared with the appropriate agency or group, so they may assist with treatments on private lands.

There will likely be increased sediment yield and associated nutrient yield from the runoff waters of the burned watersheds. The sediment increases may affect some water facilities (stock ponds). The nutrient level increase in the stream water can increase algae growth in the stream courses. Streams, wetlands, and springs are at risk due to possible increased potential for post-fire sedimentation. This is also a threat to aquatic species.

Treatments related to soil are covered in the Wildlife/Vegetation/Riparian Aquatics sections.

Soil treatment objectives:

- Decrease, maintain, or prevent the threats to soils from invasive annuals and noxious weeds with herbicide and/or competitive seedings.
- Establish vegetation to provide ground cover to reduce surface soil erosion from wind and water through various mechanical and aerial applications.
- Mitigate or reduce soil loss in highly erodible soils, especially in locations that contribute to soil erosion and flood events that contribute to threat to human life and property.

Wildlife

Greater Sage-grouse

The primary wildlife concern identified is the impacts to *Centrocercus urophasianus*, greater sage-grouse, (hereafter "sage-grouse"), a BLM Sensitive Species. The fire occurred within the Owyhee North Fire and Invasive Assessment Tool (FIAT) Project Area. It impacted 10 Occupied sage-grouse leks and 15 leks with Unoccupied/Undetermined status. These leks were spread across the Cow Creek, Texas Basin, Blackstock Springs, Rockville, and Hardtrigger lek complexes. All of these complexes were located within Priority (Cow Creek and Texas Basin) and Important (Blackstock Springs, Rockville, and Hardtrigger) Habitat Management Areas. In general, nesting, brood rearing, and wintering habitat across these complexes suffered high vegetation mortality and low to moderate soil burn severity. Field reconnaissance did not detect any direct sage-grouse mortality, and telemetry studies have documented this bird's ability to avoid fire fronts, therefore estimated direct mortality was low. Indirect effects through loss of habitat represent the greatest impact to sage-grouse. Burned areas will be unsuitable for sage-grouse until significant regrowth occurs from intact root crowns and/or the seed bank.

The intensity of the fire and ecology of the sagebrush species present will result in little regrowth of fire affected shrub species. Due to the low resilience of this area following wildfire, the probability of invasive annual grasses dominating this site and precluding it from becoming suitable sage-grouse nesting/wintering habitat over the short-term is likely. Since lek complex areas are within the Priority and Important Habitat Management Areas for the Owyhee Conservation Area, the consequence of this threat would be major. Furthermore, since this wildfire resulted in the loss of a significant percentage of the nesting habitat surrounding these leks, it is likely that attendance by males at occupied leks will diminish over the next several years or more, and possibly become unoccupied and remain so without stabilization/rehabilitation treatments. In short, most of the entire fire area is largely unsuitable in the short term for sage-grouse to utilize for nesting, brood rearing or wintering, due to loss of sagebrush.

In addition to fire impacts to sagebrush in up-lands, riparian zones and spring sites have also been heavily affected. These areas serve as prime habitat for late brood rearing of sage-grouse. While they provide cover for protection from predators the seeps, springs, and water courses also support an abundance of invertebrates and palatable grasses and forbs. Both food sources have a high protein content that is key to the growth and development of sage-grouse chicks. The fire burned in a mosaic pattern in much of the riparian zone and left patches of unburned willow throughout the fire. The heavier fuel loads found in riparian zones caused higher burn severity and may suppress willow regrowth, but it is expected that areas of low to moderate severity will likely regenerate. Riparian areas are especially at risk to the expansion of noxious weeds and invasive plant species.

Sagebrush Seeding: Re-establishing sagebrush will be necessary where the majority of the sagebrush overstory was consumed by the fire to reduce the amount of time needed for this area to provide suitable nesting and brood rearing habitat.

Forb Seeding: Preferred forbs for sage-grouse should be seeded in areas where sagebrush seeding or seedlings are implemented in order to augment or restore late brood-rearing habitat. Table 2 below provides a list of forb species, developed by a local working group of biologists from BLM, Idaho Department of Fish and Game, universities, and The Nature Conservancy that should be incorporated into restoration seedings. Habitat restoration seedings would target smaller site specific locations within nesting habitat near leks and lentic brood-rearing areas. These forbs are preferred forage species and also provide habitat for numerous invertebrate species utilized by adults and chicks.

Table 2: Sage-Grouse Preferred Forbs List

Common Name	Scientific Name
Mountain dandelion	*Agoseris* spp. *Microseris* spp.
Taper-tip hawksbeard	*Crepis* spp.
Clovers	*Trifolium* spp.
Dandelion	*Taraxacum officinale*
Balsamroot	*Balsamorhiza* spp.
Milkvetch	*Astragalus* spp.
Burnet	*Sanguisorba* spp.
Biscuitroot	*Lomatium* spp.
Globemallow	*Sphaeralcea* spp.
Phacelia	*Phacelia* spp.
False yarrow	*Chaenactis* spp.
Penstemon	*Penstemon* spp.
Eriogonum	*Eriogonum* spp.

Other Wildlife Species

The loss of sagebrush and bitterbrush will also result in a temporary loss of habitat utilized by pronghorn, mule deer, bighorn sheep, and other wildlife species. Until natural regeneration occurs and/or seeding treatments establish, the area will not provide appropriate cover or forage habitat for these species. However, these species are highly mobile and have very large home ranges that will allow them to move to appropriate habitats until the Soda fire area recovers. The loss of sagebrush will have long term effects on other sagebrush-obligate birds as well, including the Idaho BLM Sensitive Species: Brewer's sparrow, sage sparrow and sage thrasher. Many of the treatments proposed to provide habitats for sage-grouse will benefit this suite of species.

Golden Eagles

There are numerous golden eagle nest sites spread throughout the burned area, occurring on steep, rocky, cliff faces. These will remain usable by golden eagles; however the habitat for their surrounding prey base has been significantly degraded. The loss in prey abundance and diversity could negatively impact fledging success, should birds attempt to nest within or near the fire perimeter in coming years. The treatments being prescribed to stabilize and restore sagebrush habitats throughout the fire will benefit golden eagles indirectly through benefits to prey species.

Treatments

S5 Noxious and Invasive Weeds; ES Issue 3 - Habitat for Threatened and Endangered Species
ES Issue 5 – Noxious Weeds and Invasive Species

Aerially apply approximately 22,305 acres of the herbicide imazapic at a rate of 6 ounces per acre in the fall of 2015 on areas suitable for drill seeding. Imazapic is a pre-emergent herbicide that is partially selective to annual grass species and will be used as a seedbed preparation for subsequent drill seeding treatments. Imazapic has been shown to negatively impact some established perennial grasses and forbs, as well as sagebrush germination. Allowing sites to remain fallow for a year following the herbicide treatment will be necessary to allow for the establishment of desired seeded species. These areas will be drill seeded in the fall of 2016.

S2 Ground Seeding; ES Issue 2 - Soil/Water Stabilization
ES Issue 3 – Habitat for Threatened and Endangered Species
ES Issue 5 - Noxious Weeds and Invasive Species

Approximately 20,841 acres, spread throughout multiple areas, will be drill seeded using standard rangeland drills without depth bands in the fall 2015. These are areas outside of the fall 2015 herbicide/all 2016 drill seeding treatments. The areas are in soils identified as highly erosive and thus were excluded from the initial fall imazapic herbicide treatment. These areas contain various densities of annual invasive grasses and will be evaluated for seeding success in approximately two years. Based on the seeding success a follow-up treatment of imazapic or other suitable herbicide may be necessary to reduce the amount of annual grass on site and release remaining native vegetation and drill seeded species; this could include broadcast or spot treatments based on evaluation results.

All drill seeding areas would have a Class III cultural inventory completed prior to drill seeding. Identified cultural resources would be avoided during seeding operations.

Table 3: Drill Grass Seeding Mix A

Soda Drill Mix A Fall 2015 - Native	Seeding Acres	Bulk Lbs/ Ac	PLS Lbs/ Ac	% of Mix
Snake River Wheatgrass, Secar	2,793	1.0	0.8	11%
Bluebunch Wheatgrass, Anatone	2,793	5.0	3.8	45%
Thickspike Wheatgrass, Critana	2,793	2.0	1.5	20%
Big Bluegrass, Sherman	2,793	0.5	0.3	24%
TOTAL	2,793	8.5	6.4	100%

Table 4: Drill Grass Seeding Mix B

Soda Drill Mix B Fall 2015 - Introduced	Seeding Acres	Bulk Lbs/ Ac	PLS Lbs/ Ac	% of Mix
Crested Wheatgrass, Hycrest II	18,048	3.0	2.4	30%
Siberian Wheatgrass, Vavilov II	18,048	5.0	4.0	55%
Thickspike Wheatgrass, Critana	18,048	2.0	1.5	15%
TOTAL	18,048	10.0	8.0	100%

The 2016 drill seeding following 2015 herbicide seed bed prep will utilize the same seed mixes.

Areas within the East Reynolds allotment, primarily in pasture 2 (Little Kane), were identified for possible drill seeding. However, due to complexities with HMA, OHV, livestock grazing and terrain limitations further evaluation of drill seeding potential is needed.

S3 Aerial Seeding Grass; ES Issue 2 - Soil/Water Stabilization
ES Issue 3 – Habitat for Threatened and Endangered Species
ES Issue 5 - Noxious Weeds and Invasive Species

Approximately 62,808 acres that, due to terrain, are inaccessible to mechanical treatments will be seeded with perennial grass species in the fall of 2015. The fire removed much of the above-ground annual biomass and decreased annual grass seed in many areas, creating a desirable seed bed. Aerially seeding grasses immediately following the fire will provide the best chance to establish desirable perennial grasses that can compete with invasive grasses in the future. These areas will be evaluated in approximately two years to determine if herbicides need to be utilized to control invasive grasses and release the desirable perennial grass species. Imazapic has been shown to inhibit germination in desirable species such as bluebunch wheatgrass, Siberian wheatgrass, crested wheatgrass, Sandberg bluegrass, bottlebrush squirreltail, big sagebrush, alfalfa, and other species. However, once established these species are tolerant (to varying degrees) of applications of 2-12 oz. /acre. Within the 64,191 acres identified it was determined that aerial seeding grasses in fall 2015 without an herbicide seed bed preparation will be the most effective method of establishing perennial grasses. Erosion control is one of the objectives of Aerial Grass Seed Mix 1 (Table 5). Applying imazapic to burned ground this fall, in this area, would be counterproductive to the main goal of establishing vegetation immediately to mitigate soil erosion. Areas that don't receive an imazapic application this fall will be evaluated for future applications which will be designed to suppress invasive annuals and release perennial species allowing them to increase in density and continue to compete with invasive species.

The seed mixes shown below utilize ecologically adapted species that will meet multiple resource objectives such as: erosion control, annual invasive grass competition/control, wildlife habitat, sage-grouse nesting habitat, and forage production.

Table 5: Aerial Grass Seeding Mix 1

Soda Aerial Grass Mix 1 Fall 2015 Native Erosion Control	Seeding Acres	Bulk Lbs/ Ac	PLS Lbs/ Ac	% of Mix
Bluebunch Wheatgrass, Anatone	17,978	6.0	4.6	31%
Streambank Wheatgrass, Sodar	17,978	3.0	2.4	20%
Thickspike Wheatgrass, Schwendimar	17,978	1.5	1.1	9%
Big Bluegrass, Sherman	17,978	1.5	0.9	41%
TOTAL	17,978	12.0	9.1	100%

Table 6: Aerial Grass Seeding Mix 2

Soda Aerial Grass Mix 2 Fall 2015 Native High Elevation Hardtrigger HMA	Seeding Acres	Bulk Lbs/ Ac	PLS Lbs/ Ac	% of Mix
Bluebunch Wheatgrass, Anatone	13,032	8.0	6.1	31%
Big Bluegrass, Sherman	13,032	2.0	1.3	42%
Idaho Fescue, Joseph	13,032	2.0	1.6	27%
TOTAL	13,032	12.0	9.0	100%

Table 7: Aerial Grass Seeding Mix 3

Soda Aerial Grass Mix 3 Fall 2015 Native/Introduced Moderate Invasive Competition	Seeding Acres	Bulk Lbs/ Ac	PLS Lbs/ Ac	% of Mix
Siberian Wheatgrass, Vavilov II	18,994	5.0	4.0	39%
Snake River Wheatgrass, Discovery	18,994	3.0	2.3	17%
Bluebunch Wheatgrass, Anatone	18,994	3.0	2.3	14%
Sandbergs Bluegrass, Mountain Home	18,994	1.0	0.7	30%
TOTAL	18,994	12.0	9.3	100%

Table 8: Aerial Grass Seeding Mix 4

Soda Aerial Grass Mix 4 Fall 2015 Introduced/Native High Invasive Competition	Seeding Acres	Bulk Lbs/ Ac	PLS Lbs/ Ac	% of Mix
Siberian Wheatgrass, Vavilov II	12,804	8.0	6.5	56%
Sandbergs Bluegrass, Mountain Home	12,804	1.0	0.7	27%
Bottlebrush Squirreltail	12,804	3.0	2.0	17%
TOTAL	12,804	12.0	9.2	100%

S3 Aerial Seeding Shrub/Forb; ES Issue 3 - Habitat for Threatened and Endangered Species

Approximately 156,587 acres will be seeded with sagebrush species appropriate for the site and the forb seed mix. As stated in the aerial grass seeding description the fire removed much of the above ground annual grass biomass and decreased the annual grass seed bank creating open areas that are suitable for sagebrush establishment. The best opportunity to establish sagebrush is during the first fall/winter

following fire when these conditions occur. It is much more difficult to establish sagebrush by seeding into existing vegetation. Consequently it is critical that as much of the burned area as possible be aerially seeded with sagebrush seed fall/winter 2015. Much of the aerial shrub and forb seeding treatment area will be first drill seeded thus providing an improved seedbed for establishment. Also, chaining will occur within the old Trimbly drill seeding area to help increase the establishment of shrubs and forbs within the old seeding. In other areas, terrain precludes the use of equipment to either prepare the seed bed or to follow after the seeding with a treatment such as chaining or harrowing to aid in seedling establishment. These inaccessible areas are steep and rocky with crevices, hollows and varying interspaces that will potentially increase germination and establishment success and allow for seedling micrositing. Aerial shrub and forb seeding should be effective if favorable climate and weather patterns occur. Within the areas where sagebrush and forb seed is being applied during the fall/winter of 2015, imazapic would be applied on a limited basis, and would only being applied to areas that will be drill seeded next fall. Imazapic herbicide has been shown to decrease sagebrush seedling germination by 50%, as well as reduce germination rates in alfalfa and other forbs. However, applying imazapic to established forbs and shrub seedlings has been shown to have fewer negative effects (Link and Hill 2006, Vollmer and Vollmer 2008). Seeding sagebrush immediately after the fire provides the best opportunity for establishment. Seeded areas can then be evaluated for annual grass presence and herbicides can later be used if necessary to control annual invasive grasses and release desirable vegetation such as established sagebrush seedlings and forbs. The forb species utilized in this mix are common and inexpensive and will benefit sage-grouse and other wildlife species in the area following the wildfire event.

Table 9: Aerial Sagebrush/Forb Seeding Mix 7

Soda Aerial Sagebrush/Forb Mix 7 Winter 2015/2016 Low Sagebrush		Seeding Acres	Bulk Lbs/ Ac	PLS Lbs/ Ac	% of Mix
Alfalfa, Ladak	*Medicago sativa*	56,680	1.0	0.81	31%
Small Burnet, Delar	*Sanguisorba minor*	56,680	1.0	0.76	6%
Western Yarrow, Eagle	*Achillea millefolium* var. *occidentalis*	56,680	0.1	0.1	36%
Low Sagebrush	*Artemisia arbuscula*	56,680	1.0	0.2	26%
TOTAL		56,680	3.1	1.8	100%

Table 10: Aerial Sagebrush/Forb Seeding Mix 8

Soda Aerial Sagebrush/Forb Mix 8 Winter 2015/2016 Wyoming Big Sagebrush		Seeding Acres	Bulk Lbs/ Ac	PLS Lbs/ Ac	% of Mix
Alfalfa, Ladak	*Medicago sativa*	83,628	1.0	0.81	31%
Small Burnet, Delar	*Sanguisorba minor*	83,628	1.0	0.76	6%
Western Yarrow, Eagle	*Achillea millefolium* var. *occidentalis*	83,628	0.1	0.1	36%
Big Sagebrush, Wyoming	*Artemisia tridentate* ssp. *wyomingensis*	83,628	1.0	0.2	26%
TOTAL		83,628	3.1	1.8	100%

Table 11: Aerial Sagebrush/Forb Seeding Mix 9

Soda Aerial Sagebrush/Forb Mix 9 Winter 2015/2016 Basin Big Sagebrush		Seeding Acres	Bulk Lbs/ Ac	PLS Lbs/ Ac	% of Mix
Alfalfa, Ladak	*Medicago sativa*	16,280	1.0	0.81	31%
Small Burnet, Delar	*Sanguisorba minor*	16,280	1.0	0.76	6%
Western Yarrow, Eagle	*Achillea millefolium* var. *occidentalis*	16,280	0.1	0.1	36%
Big Sagebrush, Basin	*Artemisia tridentate* ssp. *tridentata*	16,280	1.0	0.2	26%
TOTAL		16,280	3.1	1.8	100%

In addition to the above mentioned seedings, another aerial forb seeding will be applied to critical sage-grouse areas (see Table 12). This seed mix would be comprised of native, available forbs preferred by sage-grouse. The current planned acreage for this mix is 14,323 acres but this may be reduced due to seed availability. Availability of these species is limited and the seed mix will be applied to appropriate areas focusing on active leks and slopes less than 30% (Jason Pyron, Fish and Wildlife Service, personal communication). The 2015 herbicide application areas will not be seeded to avoid reduced forb germination. This mix will be applied in fall/winter 2015. Where applicable, a follow up treatment of chaining or harrowing to increase seed germination and establishment will be evaluated.

Table 12: Aerial Forb Seeding Mix 10

Soda Aerial Forb Mix 10 Fall/Winter 2015 Sage-grouse Preferred		Seeding Acres	Bulk Lbs/ Ac	PLS Lbs/ Ac	% of Mix
Penstemon, Firecracker	*Penstemon eatonii*		0.100	0.072	33.0%
Penstemon, Sand (Sharpleaf)	*Penstemon accuminatus*		0.001	0.001	0.2%
Globemallow, Gooseberryleaf	*Sphaeralcea grossulariifolia*		0.200	0.135	51.6%
Western Hawksbeard	*Crepis occidentalis*		0.015	0.011	7.0%
Arrowleaf Balsamroot	*Balsamorhiza sagittata*		0.070	0.014	0.6%
Basalt Milkvetch	*Astragalus filipes*		0.130	0.091	7.0%
Biscuitroot, Fernleaf	*Lomatium* sp.		0.025	0.050	0.5%
TOTAL		*	0.541	0.374	100%

*Acres for this mix will be determined based upon seed availability.

Antelope bitterbrush was abundant in certain areas of the fire, and occasional too common throughout in other areas. Areas that had high densities of antelope bitterbrush pre-fire were identified using aerial imagery, ecological site descriptions (ESD), field visits, and local knowledge. Terrain precludes the use of equipment to either prepare the seed bed or to follow after the seeding with a treatment such as chaining or harrowing to aid in seedling establishment. These inaccessible areas are steep and rocky with crevices, hollows and varying interspaces that will potentially increase germination and establishment success and allow for seed micrositing. These areas total approximately 3,182 acres and will be aerially seeded with antelope bitterbrush during fall/winter 2015 (Table 13).

Table 13: Aerial Shrub/Forb Seeding Mix 11

Aerial Shrub/Forb Mix 11 Antelope Bitterbrush		Seeding Acres	Bulk Lbs/ Ac	PLS Lbs/ Ac	% of Mix
Bitterbrush, Antelope	*Purshia tridentata*	3,182	1.0	0.8	100%
TOTAL		3,182		0.8	100%

S4 and R4 Seedling Planting; ES Issue 3 - Habitat for Threatened and Endangered Species
BAR Issue 1 - Lands Unlikely to Recover Naturally

Approximately 1,350,000 sagebrush seedlings will be planted throughout the burned site over the next three years (see Table 14). The planted seedlings will be a combination of containerized and bare-root stock of the appropriate species and subspecies. Planting will occur in both fall/spring. Planting areas and preferred species for each site will be identified by local biologists and ecologists. Local specialists will also assist with adjustments to planting strategy based on aerial shrub seeding success and observed sage-grouse behavior and habitat use.

The objective of sagebrush seedling plantings will be to increase the suitability of habitat surrounding occupied leks and late brood rearing areas damaged by the fire. Initially targeted planting areas will focus on suitable areas within three miles of leks and utilized seeps, springs, and streams. Planted seedlings will provide for and enhance nearby cover and foraging habitat for sage-grouse during the breeding and late brood rearing season. In future years seedling plantings will expand to areas outside of leks into other areas to provide shrub structure in conjunction with the aerial shrub seeding.

Approximately 750,000 seedlings of bitterbrush will be planted over the next three years (see Table 12). The planted seedlings will be bare-root stock and planting will occur in both the fall and spring. Identification of targeted planting areas and adjustments to planting strategy based on field observations will be coordinated with local biologists and ecologists. Field office biologists assisted with identifying priority planting areas for fall of 2015 and fall of 2016. The potential exists for fire scorched bitterbrush to re-sprout on its own or propagate from seed that may have occurred before the fire.

Based on funding and surplus stock available for purchase, numbers proposed for planting could change for each of the fall and spring planting seasons. Bitterbrush and sagebrush will be grown out in fiscal year 2016; planting will occur if surplus stock is available for purchase.

Table 14: Seedling Planting Commitment

Species	FY17	FY18	FY19
Sagebrush	450,000	450,000	450,000
Bitterbrush	250,000	250,000	250,000

S14 Juniper Removal; ES Issue 3 - Habitat for Threatened and Endangered Species

Stands of expanding juniper underwent various levels of mortality due to the fire. The opportunity exists to target seral-stage junipers which were not affected by the fire. Old-growth, and other juniper occurring on juniper sites would not be targeted. Where applicable, juniper slash would be strategically placed to protect sensitive or degraded areas.

Future Projects

- Collection and grow out of local forb seed and planting of forb seedlings in priority areas.
- Local bitterbrush seed collection, grow out and seed caching.
- Biological Thinning, (using animals for annual grass biomass and seed production removal), will be further discussed with more specific treatment guidelines and practices developed. Areas identified for biological thinning will be evaluated during the first growing season and may be treated with combinations of biological thinning, herbicide, and mechanical treatments for seed bed preparation and seeding treatments to increase perennial grass and shrub species and out-compete existing high density annual grass communities.

Vegetation

Vegetation within the Soda fire area is mostly sage-steppe plant communities. Ecological sites are primarily loamy Wyoming sagebrush/bluebunch wheatgrass or shallow claypan low sagebrush/bluebunch wheatgrass or Idaho fescue sites. There are smaller amounts of loamy basin big sagebrush, loamy mountain sagebrush, and sandy loam Wyoming sagebrush ecological sites (Table 15).

Table 15: Soda Fire Ecological Sites (Idaho only, all ownerships)

Ecological Site	Ecosite Group (Temperature/Moisture Regime)	Acres	Percent of Fire
Loamy 10-13 ARTRW8/PSSPS and Sandy loam 8-12 ARTRW8/ACHY and Loamy 8-12 ARTRW8/PSSPS-ACTH7 and Loamy 11-13 ARTRT/PSSPS and Loam 12-16 ARTRT/FEID-PSSPS	Big sagebrush Warm Dry	56,627 13,781 4,579 23,785 4,374 = 103,146	24% 6% 2% 10% 2% = 44%
Shallow claypan 12-16 ARAR8/FEID and Shallow claypan 11-13 ARAR8/PSSPS	Low sagebrush Warm Dry	51,139 41,941 = 93,080	22% 18% = 40%
Loamy 13-16 ARTRV/FEID and Loamy 16+ ARTRV/FEID	Big sagebrush Cool Moist	13,872	6%
No ecological site identified		14,232	6%
Other*		8,619	4%
Total:		232,949	100%

*Other Ecological Sites include Calcareous loam, Dry meadow, Loamy bottom 12-16, Mahogany savanna, Mountain ridge, and Very shallow stony loam 10-14; none of these make up more than 3% of the fire area.

Pre-burn vegetation typically consisted of an overstory of sagebrush, with varying amounts of perennial bunchgrasses, invasive annual grasses (cheatgrass, other annual bromes, medusahead, and ventenata), and forbs. In general, the lower elevations have a lower proportion of perennial bunchgrasses and a higher proportion of cheatgrass. Cheatgrass is common throughout the burned area, while medusahead, other annual bromes, and ventenata are most abundant in the south and southwest part of the fire. Few areas of pure annual grass

monoculture were present within the fire area, besides medusahead patches on clay soil openings in the Rockville and Juniper Springs allotments.

The fire burned fairly continuously within the perimeter, with relatively few unburned pockets (according to the BARC map). The BARC shows about 11% unburned within the perimeter; much of this is mapped near the fire edge. Outside of the few unburned pockets, shrub mortality is virtually 100%. In much of the fire, remaining shrub islands to provide seed sources are a prohibitive distance from most of the burned area. Perennial grass mortality within the burn is variable, but generally high. The BARC map shows in general low severity burn on the northern part of the fire, moderate severity on the southern end, and very few, small areas of high severity burn. However, estimates of perennial grass viability from field visits do not correlate well with the BARC map, in that there were generally low estimates of perennial grass survival (10-30%) throughout areas mapped as both low and moderate burn severity. In other words, burn intensity appeared higher than burn severity across most of the fire. We visited only a few sites where we estimated up to 50% perennial grass survival. Additional field visits will be necessary to see the perennial and annual grass response following fall moisture events to validate perennial grass mortality. Cheatgrass, medusahead, and other annual grasses were consistently burned across the top, but in most cases a layer of annual grass seeds was visible at the soil surface beneath the ash layer. Forb mortality also appeared high, but species from bulbs or other deeply buried growing parts are expected to survive.

Up-land vegetation values in the Soda fire area include extensive Wyoming sagebrush and low sagebrush stands, and more limited areas of basin big sagebrush, mountain big sagebrush, mountain mahogany, and salt desert shrub stands. Shrub cover has been largely removed across the fire area. Perennial grass mortality also appears high (frequently 70-90% in areas visited). Of all the pre-burn vegetation types, Wyoming sagebrush types are the highest priority treatment areas. Leaving these areas untreated would have major consequences including a probable vegetation type conversion to annual-dominated systems, shortened fire return interval, eventual loss of native plant diversity and degraded watershed function.

Mountain mahogany and oceanspray plant communities are also threatened with a likely loss of overstory, which poses an extreme threat to the plant community health.

The threat to habitat, especially habitat important to the sage-grouse, is proportionate to the threat of recurring wildfire. A conversion to exotic annual grasses will increase the fire frequency and the potential for future large fires to occur. This higher frequency increases the risk to Wildland Urban Interface (WUI) areas, public and private infrastructure, vegetation/habitat rehabilitation investments, and remaining sage-grouse and other wildlife habitat (adjacent to burn).

Treatments that are specified in other sections, Wildlife, Noxious Weeds, Wild Horse and Burro HMAs and others include ground seeding, aerial seeding, seedling planting and noxious weed control will benefit the overall recovery of vegetation throughout the fire. Treatments and design features specific to Special Status Plants (SSP) and Areas of Critical Environments Concern (ACEC) are listed below.

Special Status Plants

At least 98 occurrences of 22 different species of Special Status Plants (SSP) are mapped within the fire perimeter. SSP generally grow on specialized habitats, in this case often ash outcrops, sandy draws, or cindery openings (Table 16). These open areas typically have low vegetative cover, and consequently were often unburned or burned at lower intensity than surrounding areas.

Table 16: Special Status Plant Occurrences within Soda Fire

Species Name	Common Name	# of EOs	Habitat	Recommendations
Astragalus conjunctus	Stiff milkvetch	13	Sagebrush scrub	No avoidance recommended
Astragalus cusickii var. sterilis	Barren milkvetch	4	Ash outcrops	Avoid mapped occurrences and a 100-foot buffer
Astragalus mulfordiae	Mulford's milkvetch	1	Sandy openings within sagebrush	Only known occurrence is non-specific; no avoidance recommended
Astragalus purshii var. ophiogenes	Snake River milkvetch	1	Open, often shallow soil areas	Only known occurrence is non-specific; no avoidance recommended
Chaenactis cusickii	Cusick's pincushion	7	Ash outcrops	Avoid mapped occurrences and a 100-foot buffer
Cryptantha propria	Malheur cryptantha	2	Rocky openings or shallow soil	Avoid mapped occurrences and a 50-foot buffer
Cymopterus acaulis var. greeleyorum	Greeley's wavewing	3	Clay soil ash outcrops	Avoid mapped occurrences and a 100-foot buffer
Dimeresia howellii	Dimeresia	5	Cindery soil openings	Avoid mapped occurrences and a 100-foot buffer
Downingia bacigalupii	Bacigalupi's downingia	1	Mudflat edges	Avoid mapped occurrences and a 100-foot buffer
Eatonella nivea	White eatonella	3	Open, loose-soil areas	Avoid mapped occurrences and a 100-foot buffer
Glyptopleura marginata	White-margined wax plant	5	Open, loose-soil areas	Avoid mapped occurrences and a 100-foot buffer
Catapyrenium congestum	Compact earth lichen	1	Open, desert pavement areas	Avoid mapped occurrences and a 50-foot buffer
Lomatium packardiae	Packard's milkvetch	8+	Clay/ash influenced sagebrush stands	No avoidance recommended
Mentzelia mollis	Smooth stickleaf	16	Ash outcrops	Avoid mapped occurrences and a 100-foot buffer
Monardella angustifolia	Narrowleaf monardella	1	Open ash/talus slopes	Avoid mapped occurrences and a 100-foot buffer
Nemacladus rigidus	Rigid threadbush	2	Cindery soil openings	Avoid mapped occurrences and a 100-foot buffer
Pediocactus simpsonii	Simpson's hedgehog cactus	3	Open shallow-soil areas within sagebrush	Avoid mapped occurrences and a 100-foot buffer
Phacelia lutea var. calva	Malheur yellow phacelia	16	Ash outcrops	Avoid mapped occurrences and a 100-foot buffer
Potamogeton diversifolius	Waterthread pondweed	1	Ponds, reservoirs	Avoid mapped occurrences and a 100-foot buffer
Sairocarpus kingii	King's snapdragon	1	Rocky slopes or calcareous openings within shrub communities	Avoid mapped occurrence; no buffer

Species Name	Common Name	# of EOs	Habitat	Recommendations
Stanleya confertifolia	Malheur prince's plume	2	Ash outcrops	Avoid mapped occurrences and a 100-foot buffer
Trifolium owyheense	Owyhee clover	2	Ash openings	Avoid mapped occurrences and a 100-foot buffer

The risk of conversion to invasive annual species is a moderate to extreme threat that could have major consequences to the SSP and ACEC plant community areas.

Design features for SSP

- This applies to drill seeding, herbicide spraying, and biological thinning treatments. Biological thinning may require exclosure fencing. Aerial herbicide spraying will require buffers as recommended in Table 16.
- Hand application of herbicide closer to an occurrence may be considered on a case-by-case basis (for example, fall glyphosate application).
- During unit layout, a botanist will verify, identify and flag occurrence areas and buffers
- Any treatments outside of the burned area perimeter (including the proposed fuel break) will need additional SSP consideration.

Treatments

R7 Fence, Gate, Cattleguard; BAR Issue 4 - Repair or Replace fire Damaged Facilities

Repair exclosure fences at McBride Creek, Coal Mine Basin, Succor Creek (Pastures 1 & 2) & Stateline. These fences are identified and included in the Rangeland Management and Riparian and Aquatics sections.

S7 Fence, Gate, Cattleguard; ES Issue 2 - Soil/Water Stabilization

Construct approximately three miles of vehicle barrier segment fences for the purpose of protecting SSP in areas of ash outcrops subject to increased hill-climbing as a result of the removal of surrounding vegetation (*Mentzelia mollis* in Rats Nest Pasture 1; *Chaenactis cusickii* and *Phacelia lutea var. calva* in Juniper Spring Pasture 1; possibly *Chaenactis cusickii* in Poison Creek Pasture 1).

S5 Noxious and Invasive Weeds; ES Issue 5 - Noxious Weeds and Invasive Species

Buffers of 100 feet from herbicide, drill, and biological thinning are required around the Special Status Plant habitat areas. The buffers areas may be treated with alternate herbicides such as glyphosate on a case by case basis using ground application, either by vehicle, UTV, or by hand, to control annual invasive species. If treatment is necessary herbicide will be applied in these areas to allow the release of existing native plants. Evaluation of the spray and release treatment will be conducted to determine if additional follow-up treatments are needed in the buffer areas.

S7 Fence, ES Issue 5 - Noxious Weeds and Invasive Species

Buffers of 100 feet from herbicide, drill, and biological thinning are required around the Special Status Plant habitat areas. If biological thinning is utilized as seed bed preparation, fine fuels management, or if season of use is modified to assist in treatment success, temporary fences will need to be installed to the 100 foot buffer area prior to the livestock use to protect the SSP species. The number and length of these fences are unknown as is the timing of the application.

Future Projects

A project that includes local seed collection, grow-out and planting will be initiated to enhance pollinator habitat adjacent to special status plant populations of *Stanleya confertifolia* (Rockville Pasture 4, Succor Creek Pasture 1, and Coal Mine FFR) and *Trifolium owyheense* (Succor Creek Pastures 1& 2).

ACECs

There are five Areas of Critical Environmental Concern (ACECs) within the Soda fire (Table 15). Each ACEC was burned to varying degrees. See Table 15 for a description of the ACEC values and post-burn conditions for each ACEC.

Table 17: ACECs within Soda Fire

ACEC Name	**Acres**	**ACEC Values** (per RMP)	**Post-burn Condition**
Jump Creek Canyon	612	Riparian community, Wyoming sagebrush-bluebunch community, wildlife, scenic values, recreation	Up-land vegetation high burn intensity. Riparian low intensity on lower stretch; moderate intensity upstream. Few impacts to recreation facilities.
Squaw Creek	150	Wyoming sagebrush-bluebunch wheatgrass community	Northern portions with moderate to high burn intensity. Southern portion unburned.
McBride Creek	261	Special status plants	Ash outcrops unburned to low intensity. Surrounding vegetation moderate to high intensity burn. Exclosure fence mostly intact.
Coal Mine Basin	1,604	Special status plants, scenic values, fossils. Adjacent to Vale's ACEC.	Ash outcrops unburned to low intensity. Surrounding vegetation moderate to high intensity burn. Exclosure fence corner posts burned.
Sommercamp Butte	440	Mountain mahogany-bluebunch wheatgrass and oceanspray communities, scenic values	High intensity burn in much of the mountain mahogany.

The risk of conversion to invasive annual species is a moderate to extreme threat that could have major consequences to the SSP and ACEC plant community areas.

Design Features for ACEC

- Herbicide treatments are suitable for ACEC areas outside of SSP occurrences (and buffers).
- Plantings (drill or hand plant seeds, or planting stock) limited to native species.
    - Jump Creek – Drill seed above canyon as necessary
    - Squaw Creek – No treatment in unburned section (southern unit). Burned section (northern unit) broadcast seed (hand or aerial) as necessary.
    - McBride Creek – Drill or broadcast in sagebrush areas (not ash outcrop).
    - Coal Mine Basin – Broadcast seed in sagebrush areas (not ash outcrops).

- Sommercamp Butte – No broadcast or drill, but plant locally-collected source seedlings or larger containers of mountain mahogany and oceanspray plants.

Treatments

R7 Repair and Replace Fire Damaged Facilities; BAR Issue 4 - Repair or Replace fire Damaged Facilities

Repair exclosure fences at McBride Creek, Coal Mine Basin, and Squaw Creek ACEC's. (Some are duplicates of SSP exclosure repair and range fence repair).

R4 Seedling Planting, BAR Issue 1 - Lands Unlikely to Recover Naturally and Future Projects

At the Sommercamp Butte ACEC a project will be initiated that includes local seed collection, grow-out and planting to reintroduce mountain mahogany and oceanspray into the area.

Cultural Resources

A number of known sites were impacted by the Soda fire and are included in the administrative record for the project. One of the most devastating effects to cultural resources after a fire is looting, including surface collection and movement of surface artifacts, thus destroying significant cultural and scientific values. Fires make sites more susceptible to looting by exposing surface artifacts and making rock shelters and other features more visible. One instance of post-fire looting has already been reported, and the most temporally and behaviorally significant artifacts are more likely to be removed from affected sites, particularly where burns are heavy. It seems that surface areas most subject to looting have already been impacted, but disturbance of a burial by looters is possible and could have catastrophic consequences, thus would pose an extreme risk for cultural resources. Soil disturbance and erosion also have the potential to damage or destroy features and artifact spatial context at sites, particularly those around drainages and on slopes.

Design features:

- Archaeological surveys and reporting as needed for potentially site-disturbing treatments. These will likely be extensive and require contractors through an IDIQ to carry out inventories and reporting with COR/archaeologist oversight. Modeling of sample areas based on site probability in areas where there is sufficient data for sampling justification and negotiation of a less than 100% inventory with the State Historic Preservation Office (SHPO) and consultation with the Shoshone-Paiute Tribes has occurred.
- Any inadvertent discoveries of human remains must be dealt with through the Native American Graves Protection and Repatriation Act (NAGPRA) process, including work stoppage, immediate notification of the county sheriff and field office manager and protection of the integrity and confidentiality of finds to the extent possible. Field personnel and managers should be aware of these requirements in order to avoid violations.
- Limit travel to existing roads and trails. Administrative exemption for treatment application and treatment access is allowed.

Treatments

S9 Cultural Protection; ES Issue 4 - Cultural Heritage Resources

Law enforcement patrols of sites most at risk from looting based on their values, location, visibility from roads, degree of vegetation loss, and known past issues in the area. Patrols should increase from what normally occurs, particularly during high-use seasons, until vegetation has recovered sufficiently to camouflage artifacts. Coordination with Tribal Law Enforcement representative will also occur in order to ensure effectiveness and efficiency of patrol efforts.

S13 Monitoring; ES Issue 4 - Cultural Heritage Resources

Sites with the highest risk of erosion and looting should be monitored by a qualified archaeologist at least annually until soils and vegetation has recovered. In a work day 1-3 sites could be monitored depending on whether updated recording would also be needed (pre-1990s data is not sufficient for condition monitoring).

S12 Closures; ES Issue 4 - Cultural Heritage Resources

Closure of the Reynolds Creek Trail along Beck Ditch until vegetation has re-grown enough to stabilize soils and loose rock broken off by the fire has settled (future needs exist for evaluation of feature suitability as a pedestrian and horse trail and feature/trail stabilization to historic standards). This closure would require a federal register notice.

S3 Aerial Seeding; ES Issue 4 - Cultural Heritage Resources

Aerial seed high risk sites to camouflage artifacts and limit erosion. Recommendation is based on GIS analysis of sites having significant elements combined with those on >25 degree slope and/or near main roads within moderate to high intensity burn GIS data, and as determined by past or post-fire observations of looting, erosion, and fire effects. Sites include open lithic scatters and rock shelters with significant cultural elements.

S9 Cultural Protection; ES Issue 4 - Cultural Heritage Resources

Installation of anti-looting signs will occur inside and outside of the APE.

Fire Suppression Damage

Have the regional paleontologist visit sites near or at dozer lines to assess damage and future needs and check conditions and significance of a sample of sites in and out of the fire to aid in future planning.

Noxious Weeds

Noxious weeds are present in the burned area. Noxious weeds are now recognized worldwide as posing threats to biological diversity, second only to direct habitat loss and fragmentation. Noxious weeds are known to alter ecosystem functions such as nutrient cycles, hydrology, and wildfire frequency; out-compete and exclude native plants and animals; and to hybridize with native species. The presence and abundance of noxious weeds in an ecosystem is highly dynamic subject to changes in the local environment (Whitson, T.D., et al. 1992, Cal-Ipc, 2007). All natural communities are susceptible to invasion by noxious weeds.

Noxious weeds species that have been identified in and adjacent to the burn area include:

Bull thistle (*Cirsium vulgare*) {Oregon only}: Generally limited occurrences in riparian areas, spring developments and ponds. This is a medium priority species that would be chemically treated when found.

Canada thistle (*Cirsium arvense*): Occurs throughout fire perimeter. Primarily confined to riparian areas, spring developments and ponds. Due to establishment throughout fire perimeter in majority of riparian areas this species is low priority for chemical treatment.

Diffuse knapweed (*Centaurea diffusa*): Limited occurrence within fire perimeter. One known large site on McBride Creek road near Hwy 95. This site encompasses about 100 acres and plants occur at a density less than 1%. Chemical treatments have been ongoing yearly for more than 15 years. Single individual plants have been found and treated along roadways in recent years and new populations in the surrounding perimeter indicate potential for new infestations within perimeter. Due to the present limited scope, this species is high priority for treatment during inventory. Inventory can be completed throughout the year because the plant skeletons remain intact. Chemical treatments would occur throughout the active growing season.

Jointed goatgrass (*Aegilops cylindrica*): Limited known occurrence within fire perimeter near Sage Creek in north and infestation on McBride Creek road on state and BLM lands discovered in 2015 prior to fire. This species has the potential to expand and is high priority for treatment especially along roadsides. Surveys would be focused on late summer after emergence. Treatments would be a fall application with pre-emergent herbicide.

Leafy spurge (*Euphorbia esula*): This is a high priority species due to the high potential for expansion and establishment. Several small infestations (0.1 - 0.5 acres) of this species occurring on the southern boundary of the fire perimeter near Hwy 95 and Succor Creek in Oregon and Idaho. Chemical treatments have been ongoing by Vale and Boise Districts. Thorough inventory could be accomplished with an aerial survey in early summer. Due to present limited occurrences and small infestations, chemical treatments will continue to be implemented on known and discovered infestations in early summer through late fall.

Perennial pepperweed (*Lepidium latifolium*): This is a medium-high priority species. Several creeks including Dry Creek at Hwy 95, Sage Creek, Hardtrigger Creek, and Reynolds Creek have perennial pepperweed infestations. These infestations typically are low to moderate density and only inhabit the riparian area. There are also occasional ponds, springs and roadsides with small infestations (>0.1 – 0.25 acres). Chemical treatment priorities will be on small infestations to prevent expansion.

Poison hemlock (*Conium maculatum*): This is a medium priority species due to the fact there are not many known occurrences of this species within or adjacent to the fire. Riparian areas are the biggest threat.

Puncturevine (*Tribulus terrestris*): This is a medium priority species and is primarily a roadside threat. Several roads are known to have problems including Sands Basin and Hardtrigger. Inventory will focus on roadways and trails. Chemical treatments would be implemented in problem areas.

Purple loosestrife (*Lythrum salicaria*): This is a very limited species with the potential to inhabit riparian areas. There is an effective biological control agent (beetle) thoroughly established in the region. Purple loosestrife is of low concern due to the effectiveness of this insect.

Rush skeletonweed (*Chondrilla juncea*): This is a high priority species due to the increasing number of infestations and potential for establishment throughout the fire perimeter. Presently, rush skeletonweed is

known to occur in several areas including a four mile stretch of Hwy 95 (approximately mile markers 10 -14), and an area near McBride Creek at the Oregon/Idaho line. This infestation is known to occur on several hundred acres at densities ranging from 1-25%. Individual plants have been documented and treated along roadsides in several other areas throughout and adjacent to the fire perimeter. It also potentially infests an area known as "Spanish Charlie Basin" near Succor Creek in Oregon. Chemical treatments would begin in the fall of 2015 on known locations and continue throughout the year as infestations are discovered. Inventory can begin immediately due to the fact plant skeletons remain highly visible throughout the year. Intensive ground surveys across the landscape will be required to mitigate the establishment and spread of this plant. Biological control agents (rust, mite, midge) are present in varying degrees and are having beneficial effects particularly on reducing seed production and plant vigor, however the plant is still spreading and establishing due to seed movement across long distances (50+ miles). The biological control agents can disperse on their own.

Russian knapweed (*Acroptilon repens*): This is a high priority species that is relatively limited within the fire perimeter but seems to be on the increase in the region. The majority of known occurrences are less than 0.1 acre in size near travel routes. Chemical treatment is most effective in late spring and early fall. There are biological control agents available (gall midge and gall wasp) but they are most effective on plant populations that remain succulent (riparian areas and wet meadows). Emphasis would be placed on chemical treatment of small new infestations.

Scotch thistle (*Onopordum acanthium*): Scotch thistle is very common throughout and around the fire perimeter and is medium to high priority. Chemical treatments have been ongoing in many locations. Most infestations are relatively small (> 0.1- 1.0 acre) and dependent upon weather conditions (fall moisture) and disturbances usually occur at reservoirs, spring developments and riparian areas. Inventory can occur throughout the year due to plant skeletons remaining highly visible. Chemical treatment can occur throughout the year on actively growing plants.

Spotted knapweed (*Centaurea stoebe*): There are no known spotted knapweed infestations within the fire perimeter but it does occur in several locations around the fire perimeter including Succor Creek State Natural Area (northwest), Whiskey Mountain (east), Hwy 95 (south west) and Jordan Creek (south). This will be a high priority species during inventory with chemical treatments of any located infestations.

Tamarisk (*Tamarix ssp.*): This species occurs throughout and around the fire perimeter primarily in riparian areas, springs, ponds and creeks. Great effort has been dedicated to treating this species throughout the area including in Hardtrigger Creek, Dry Creek, Wilson Creek, West Rabbit creek and in the Reynolds area which has greatly reduced the number of plants. A biocontrol agent (beetle) has recently become established in western Oregon and on the Snake River in Idaho. It is expected this insect will continue to spread throughout the region and attack remaining tamarisk plants. Tamarisk will be mapped to document new infestations and monitor for biological control damage. Limited chemical treatments will occur on isolated trees.

Whitetop (*Cardaria draba*): Whitetop occurs throughout and around the fire perimeter. Chemical treatments have occurred in many locations including McBride Creek area, Wilson road, Shares Basin, Reynolds, Squaw Creek, West Rabbit Creek and Cow Creek. Whitetop will be a medium to high priority during inventory. It is expected many infestations will be highly visible with the removal of surrounding vegetation. Chemical treatment will occur in the spring through early summer.

Yellow starthistle (*Centaurea solstitialis*): There are no known yellow starthistle infestations within the burn perimeter. There is an infestation on private property on lower Succor Creek as well south of Jordan Valley and

on Silver City Road. This is a high priority species during inventory. This species is known to be moved by vehicles and frequently establishes on roadsides.

***Russian olive (*Eleagnus angustifolia*):** Russian olive treatment has been completed throughout this area in conjunction with tamarisk control. Per the Boise District Weed Environmental Assessment, Russian olive treatments have been limited to areas with a small number of trees (less than 10 per acre). Remaining infestations are primarily on private and state lands in the Sands Basin area. Russian olive treatments will continue on small infestations. *Note: Russian olive is not on the Idaho noxious weed list.

Herbicide and biocontrol treatments have been ongoing within and surrounding the burn area for many years. All roadsides, trails, riparian areas, open rangelands, and fire suppression lines are susceptible to invasion by noxious weeds. Noxious weeds and invasive plant species have been identified as a threat for multiple other values impacted by the burn. Additionally initial treatments conducted within the burn area and increased traffic from administrative, monitoring, research, partners, cooperators, hunters, and general public greatly increase the probability of transport of noxious weeds into the burn area.

The objective for the first growing season is to treat known, prioritized noxious weed infestations and conduct an inventory of the burned area. Noxious weeds detected during the inventory would be treated when possible. Any expansion of known populations of noxious weeds would be treated to contain their spread.

The objective for the second and third years is to decrease the size and abundance of noxious weed infestations within the burned area as compared to the first year. Continue inventory of the burned area for new infestations and treat as necessary.

Treatments

S5 and R5 Noxious Weeds; ES Issue 5 - Noxious Weeds and Invasive Species
BAR Issue 2 - Noxious Weeds and Invasive Species

- Conduct short-term monitoring in FY2016 using early detection and rapid response (EDRR) assessment/monitoring of noxious weed/non-native invasive plant species infestations within the burned area.
- Inventory/assessment, photos and map new noxious weed infestations within burned area using GPS technology
- Chemical treatments using pickups, UTVs/ATVs and backpack spray units may be used on any noxious weeds located within the fire on public lands. When noxious weeds are found on state lands, the BLM will coordinate with the Idaho Department of Lands. When noxious weeds are found on private lands inside and outside of the burn perimeter, the BLM will coordinate with local Cooperative Weed Management Areas (CWMA's) Owyhee County Weed Control, Idaho Department of Agriculture and or the private landowner.
- Approved bio-control agents will be used if available and applicable on larger infestations for long term weed management.

S2 Ground Seeding, ES Issue 5 - Noxious Weeds and Invasive Species

In drill seedings the areas around heavily traveled roads will be seeded with a highly competitive introduced perennial grass species (Siberian wheatgrass) to provide a barrier for noxious weed germination from seeds transported via vehicles. This barrier will assist the fuels reduction objective by using plant species that are competitive with annual grass and will help maintain the reduced density of

annual species along roadways. The seed mix and acreages are included in the ground seeding treatment in the Wildlife section.

S5 and R5 Noxious and Invasive Weeds; ES Issue 5 - Noxious Weeds and Invasive Species
BAR Issue 2 - Noxious Weeds and Invasive Species

D7 Bio Herbicide Trial: There is the potential to incorporate a trial of the biological control D7 (*Pseudomonas fluorescens*) on invasive annuals (cheatgrass, medusahead, and jointed goatgrass).. Potential treatment areas are yet to be determined. An Environmental Assessment will need to be written for the D7 treatment. Treatments may include spray or pellet (on seed) application, with or without imazapic. Treatment application and monitoring design will need to be determined.

Recreation

Hemingway/Rabbit Creek/Wilson Creek Trail System Description:

The Hemingway/Rabbit Creek/Wilson Creek trail systems are part of two travel management areas along the Owyhee Front which, when combined, total approximately 260,000 acres and consist of approximately 950 miles of designated routes for motorized and non-motorized recreation. The Hemingway and Rabbit Creek trail systems were designed to accommodate motorized use, while the Wilson Creek trail system is for the non-motorized community. The area contains multiple parking lots, trailheads, restrooms, and an extensive sign network throughout the trail systems. The trail systems receive over 75,000 visitors annually, and are home to numerous permitted events, such as: motorcycle races, mountain bike races, ultra-running events, equestrian endurance rides, as well as ATV and motorcycle poker run/fund raisers. The peak season of use for this area is roughly March through June. Visitation during the summer and winter months is generally low with use picking back up again in the fall roughly September through mid-November.

Post Fire Description of Hemingway/Rabbit Creek Trail System:

Overall the trails within the travel management areas are in good condition. Damage to the trail system itself was mostly caused by dozer activity paralleling or crossing routes, or multiple trucks and engines utilizing the same route thus widening the trail. Loss of vegetation within the burn area is expected to have an indirect impact to trail management. Roughly 65% of the signs within this area survived the fire and are in good condition. Trail heads, parking areas, restrooms, and kiosks were not impacted by the fire.

The main concerns are the dozer line becoming permanent routes, and the significant loss of vegetation opening up the area and making it highly vulnerable to motorized cross country travel and the creations of miles of new routes.

We recommend a closure of the trail system for the Reynolds Creek Canyon and the China Ditch trail due to vulnerability to falling rock. A temporary closure to prevent the creation of new trails and further resource damage from occurring could be advantageous, however, highly controversial and extremely difficult to enforce.

Treatments

S8 Road/Trail Water Diversion; Fire Suppression Damage

Approximately 150 miles of trails need water bars to protect against potential erosion damage, as well as maintained/rehabbed back into original condition from damage caused by fire suppression activities. This work will be completed in early spring 2016 utilizing the District SWECO machine and District groomer which consists of an ATV, ATV drag, and operators.

Repair a portion of the retaining wall that burned along the concrete ramp at the Jump Creek Recreation Site is addressed in Transportation.

S11 Facilities; ES Issue 1 - Human Life and Safety

The trail numbering system signage that was damaged due to wildfire needs to be purchased for replacement and exists throughout the designated travel management areas. This is an ES issue as fall, winter, and spring use of the trail system in this area experiences high use and the numbering system is essential to ensure people stay on designated trail and roads systems and are within designated areas appropriate for their use type. Approximately 270 signs and post units (1 unit - sign, post, stickers, hardware) are needed; Wilson Creek Area - 150 units and Hemingway/Rabbit – 120 units.

S2 Ground Seeding, S7 Fence; Fire Suppression Damage

The biggest issue in this area is the high likelihood that constructed fire suppression dozer lines will be utilized by OHV recreationists in the area, leading to the creation of new unauthorized trails. Signing, fencing, ripping, seeding, and basic rehabilitation need to be accomplished in timely manner to efficiently and effectively mitigate the potential. Utilizing rocks as barriers, creating tank traps, and installing short sections of barrier fences where dozer lines intersect OHV trails will help maintain the integrity of the established and designated trail system. Approximately 35 miles (150 acres) of constructed suppression dozer line within the travel management areas needs to be rehabilitated and is estimated to require 80 hours of equipment time use.

The remaining constructed fire suppression dozer line needing seeding and rehabilitation work will be identified in the Fire Suppression Damage section.

S11 Facilities; Fire Suppression Damage

Approximately 225 signs and posts need to be purchased and installed where constructed fire suppression dozer lines intersect designated trails and road. Installed signs will identify trail and road segments that are not authorized under current trail system designation and inform the public of fire rehabilitation efforts in the area and that unauthorized trails are closed to users.

S7 Fence; Fire Suppression Damage

Approximately three miles of individual barrier fence segments need to be installed to prevent travel access to and on dozer lines and inhibit them from becoming prolonged unauthorized trails. Additional fence repair and new construction needs to be completed within the Wilson Creek area on administrative closures areas.

Jump Creek Recreation Site Description:

The Jump Creek recreation site is a popular area that receives approximately 20,000 visitors per year and is open to the public year-round. The site includes three parking areas, two upper lots which provide parking and hiking trail access, and one main/lower parking area that contains a restroom, trash receptacles, information kiosks, access into the canyon falls, fire rings, and access to Jump Creek. Most visitors utilize the main/lower parking area while at the recreation site. The uses within the immediate area consist of camping, hiking, fishing, swimming, picnicking, panning, and rock climbing. The recreation site also serves as a staging area for activities such as OHV riding, horseback riding, and hunting.

Jump Creek Recreation Post-Fire Description:

The Jump Creek Recreation area did not sustain significant damage from the fire. The area appears to have been burned out with a backing fire to protect most of the recreation site. Most of the concerns are associated with vegetation loss above the canyon and future damage to the trail system during significant rain events. The fire did

not burn into the canyon itself within the recreation site, so riparian vegetation is still intact. We do not recommend a closure of the recreation site. Rock fall potential is low, arguably not much greater than any other day within a canyon recreation site.

S11 Facilities; ES Issue 1 - Human Life and Safety

Six signs and posts will be installed to alert visitors to the potential of falling rock, especially within areas with exposed soils due to recent fire activity. Signage will inform the public about the possibility of high flows through the canyon during rain events.

S8 Road/Trail Water Diversion; ES Issue 2 - Soil/Water Stabilization

Trail maintenance needs to occur, on upper trails in particular, to minimize future erosion (i.e. water barring and armoring). This would be accomplished with seasonal employees requested in the trail system report or volunteer labor.

Wild Horse and Burro HMAs

The Soda fire burned nearly 100% of the Sands Basin and Hardtrigger Herd Management Areas (HMAs) and a third of the Black Mountain HMA. There are about 35-40 horses within the Sands Basin HMA, about 3 horses in the Hardtrigger HMA, and 30 on the Black Mountain HMA. We were able to capture 28 of the approximately 70 wild horses on the Sands Basin HMA during the emergency helicopter gather. However, we could not capture the remaining 35-40 wild horses and we intend to go back to the Sands Basin HMA and conduct a bait/water trap gather to capture the remaining wild horses. We captured 173 of the 176 wild horses in the Hardtrigger HMA; the last three horses will remain on the HMA because we were unable to capture them. We captured 78 of the 98 wild horses in the Black Mountain HMA, of which we returned ten horses (four mares were treated with contraception - PZP and then were released) to achieve the low appropriate management level.

Black Mountain and Hardtrigger HMAs are adjacent to each other and are located approximately two miles south of Murphy, Idaho (see map). The Sands Basin HMA is approximately ten miles southwest of Marsing, Idaho, seven miles west of US Highway 95 and just east of the Oregon border in Owyhee County. The majority of the HMAs contained sagebrush and salt desert shrub vegetation that has been reduced to ash and soil, and are bisected by numerous drainages, washes, and draws.

The HMA boundaries are a combination of conventional fences (most of which burned in the fire) and steep rimrock boundaries connected by short gap fences. There are internal fences within all of the HMAs. Gates will need to be opened and the pilot will need to know the location of each gate to push horses through. Gates will be opened by the BLM, contractor or livestock grazing permittee prior to the gather. Fences in the grazing allotments within the HMA will have to be considered when removing horses. Due to the total removal some horses may have to be roped. There are no known domestic horses in the HMA.

Treatments

S14 (Other) Wild Horse Gather; ES Issue 2 - Soil/Water Stabilization

Funding for the emergency wild horse gather was obtained from the Washington Office in August 2015. The BLM Boise District and Owyhee Field Office (OFO) conducted the emergency wild horse gather within the Sands Basin, Hardtrigger and Black Mountain Herd Management Areas (HMA) beginning on August 28, 2015. Supplemental feeding of the horses began on August 14.

All horses gathered were shipped directly to the Boise Wild Horse Corrals. Two truckloads (approximately 60 wild horses) were sent to the Palomino Valley Corrals north of Reno, Nevada, and the remaining horses are being held in the Boise corrals. Horses kept in the Boise corrals will be prepared (branded, vaccinated, etc.) and placed into the adoption program or held for return to the Sands Basin or Hardtrigger HMAs. Return of wild horses to the Sands Basin and Hardtrigger HMAs will depend on the rehabilitation/restoration treatments within those HMAs and associated resource and treatment objectives.

Rangeland Management

Approximately 29,672 livestock and 2,304 wild horse AUMs in the Owyhee field office were affected by the fire. Thirty six allotments in the Owyhee field office were impacted by the Soda fire.

Livestock AUMs in the burned area are affected in the short-term by the removal of vegetation. Since this is an immediate and nearly complete removal, the impact is high to very high. The Normal Fire Rehabilitation Plan (NFRP) outlines that allotments burned will be rested from grazing for two full growing seasons, or until resource objectives are met. The Idaho and Southwestern Montana Greater Sage-grouse Approved Resource Management Plan Amendment also states, in reference to grazing closures following wildfire: "Provide adequate rest from livestock grazing to allow natural recovery of existing vegetation and successful establishment of seeded species within burned/ESR areas. All new seedings of grasses and forbs should not be grazed until at least the end of the second growing season, and longer as needed to allow plants to mature and develop robust root systems which will stabilize the site, compete effectively against cheatgrass and other invasive annuals, and remain sustainable under long-term grazing management. Adjust other management activities, as appropriate, to meet ESR objectives." Resumption of grazing will be based on treatment and grazing resumption objectives. Entire pastures will be closed if the majority of the pasture was damaged by fire or is undergoing a treatment. Temporary fences will be constructed in pastures partially burned to allow for reduced grazing in the unburned portions; this will be determined on a pasture by pasture basis. By closing the BLM lands to grazing, the livestock operators in the allotments affected by the Soda fire will be required to reduce their permitted use to allow for recovery.

The Soda fire impacted approximately 350 miles of livestock management fence including gates, corners, braces, and wooden fence posts. BLM, permittees and affected private landowners will work together when possible to repair livestock management fences within the fire boundary. The fire generally damaged the exclosures around spring sources and overflow. The BLM will reconstruct or fix the damage to the exclosures. Most troughs within the fire are metal and were not damaged by the fire.

Windy Point pipeline, located in East Reynolds Creek Allotment/North Rabbit Pasture, is seven miles in length and provides water to nine troughs and one guzzler. The pipeline sustained damage during the fire due to heat and suppression actions. During suppression actions a bulldozer unearthed approximately 400 feet of steel pipe; damage was extensive and replacement of the section is necessary. No change will occur in the location of or type of construction material of the pipeline during the replacement. Approximately 3,000 feet of above-ground exposed polyethylene pipe was melted during the fire; this pipe had been temporarily fixing the existing pipeline prior to the fire. Replacement of this section will require a location change and material change; the pipeline will be made out of steel pipe and moved underground.

These rangeland improvement projects (RIPs) are necessary to manage livestock grazing and will need to be repaired or replaced, or alternate management created, prior to resumption of livestock grazing.

Treatments

S7 & R7 Fence, Cattleguard; ES Issue 2 - Soil/Water Stabilization
BAR Issue 4 - Repair or Replace fire Damaged Facilities

- Perform maintenance and repair on reservoirs, clean out to original specifications if they become filled with large amounts of sediment. Cleaning out these reservoirs and maintaining/reconstructing them to their original specifications would ensure that livestock and wildlife have viable water sources.
- Repair or replace approximately 350 miles of fire damaged fence
- Install approximately 50 miles of new temporary fence to protect treatments as needed and facilitate grazing on unburned portions of pastures where practicable.
- Fences will be evaluated for removal; up to 50 miles of temporary fence could be removed in 3-5 years as objectives are met and grazing resumes.
- Replace one double cattle guard on Reynolds Creek Road.
- Spring and riparian exclosure repairs are covered in the Riparian and Aquatics section

R11 Facilities; BAR Issue 4 - Repair or Replace fire Damaged Facilities

- Remove and replace the damaged Windy Point pipeline and install it in a more appropriate location that will not be damaged by future fire suppression efforts.
- Inventory and repair 12 guzzlers
- Floats and shut-off valves are covered in the Riparian and Aquatics section

S12 Closures; ES Issue 2 - Soil/Water Stabilization

- Complete 36 grazing closure decisions on the pastures and allotments impacted by the Soda fire. Ensure adequate inspection and enforcement during the recovery period.

Future Projects

- New spring development and trough placement to improve livestock distribution within the burned area
- Survey and realignment of approximately 75 miles of repaired fence

Fuels Reduction

The Soda fire is the largest wildfire ever recorded in the area. The amount of upper elevation sagebrush steppe (4,500-6,500 feet) consumed by the Soda fire is unprecedented, particularly in northern Owyhee County, Idaho. The Soda fire destroyed private and public infrastructure, threatened multiple communities, and consumed valuable wildlife habitat (i.e., sagebrush and bitterbrush communities) leaving the system vulnerable to the spread/increase in invasive annual grasses and an increase in fire frequency.

The fire burned approximately 279,000 acres within the Northern Great Basin Priority Area of Conservation (PAC) identified by the US Fish and Wildlife Service in its Conservation Objectives Team (COT) Report. The burned area is also located in the Owyhee North Project Planning Area (PPA) identified by the Fire and Invasive Assessment Team (FIAT) in 2015. The FIAT identified approximately 1,100 miles of linear fuel treatments (fuel breaks) within the Owyhee North PPA during its Step 2 assessments (Greater Sage-Grouse Wildfire, Invasive Annual Grasses, and Conifer Expansion Assessment, March 2015).

The National Wildfire Coordination Group (NWCG) defines fuel breaks as “a natural or manmade change in fuel characteristics which affects fire behavior so that fires burning into them can be more readily controlled” (NWCG 2012). Pro-active measures such as fuel breaks help to alleviate the amount of resources necessary to contain a fire

in wildland urban interface (WUI) areas and allow more suppression forces to be allocated to protect life, property, and important habitat in outlying areas. Fuel breaks are designed to reduce flame lengths, slow the spread of fast moving wildfire, and provide opportunities for firefighters to gain control of or contain a fire.

Research and fire suppression activities indicate fuel breaks have either slowed fires enough for suppression crews to control the incident, or have altered fuel sufficiently to limit fire spread (Monsen and Memmott 1999). Boise District fire personnel have observed the effectiveness of established fuel breaks. Established fuel breaks on the Boise District have provided a greater margin of safety for firefighters, effectively reduced flame lengths, and slowed the progression of wildfires (e.g., 2006 Ditto Rest, 2011 South Sim, and 2012 MM86 fires).

Values at Risk

- WUI areas
- Public and private infrastructure (e.g., outbuildings, fences, comm. towers, power poles)
- Vegetation/habitat rehabilitation investments (e.g., seedings, seedling plantings within burn perimeter)
- Existing sage-grouse and other wildlife habitat (adjacent to burn)

Threats to Values at Risk

- Wildfire (short- and long-term)
- Altered fire regime (i.e., increase in fire frequency) promoting/exacerbating spread of disturbance related species (e.g., cheatgrass, medusahead) (long-term)

Fuel Break Implementation Information

The fuels program proposes to develop three types of fuel breaks: prostrate kochia fuel breaks (in WUI areas), natural fuel breaks (i.e., primarily native perennial grass – no seeding), and seeded fuel breaks (native and/or non-native perennial grass – seeded). Maximum fuel break width would be up to 200 feet to either side of roads; however, environmental constraints such as adjacent vegetation, terrain, soil type, and/or resource concerns would dictate width in a given area. For example, a fuel break would be narrowed to avoid important resources or rocky areas. Treatments associated with development and maintenance of fuel breaks include (Table 19):

- road and ditch maintenance (common to all)
- disking (kochia fuel breaks only)
- herbicide application (common to all)
- seeding (kochia and seeded fuel breaks)
- woody vegetation removal (hand cutting and or mowing)

Table 19: Treatment/Activity Summary

Treatment/Activity	Miles	Acres	% BLM
Road maintenance	319		80%
Prostrate kochia (disk and seed)	69	3,327	85%
Woody vegetation removal (unburned area)	235	11,164	74%
Seeding other than kochia (unburned area)	172.5	8,137	80%
Burned area herbicide and seeding TBD by ESR treatment recommendations	TBD	TBD	TBD

Road Maintenance

- Annually maintain approximately 319 miles (80% BLM lands & 20% other lands) of roads for fire suppression access that are not currently being maintained by the state or county
- Annually maintain ditches where present

Prostrate Kochia Fuel Breaks

Prostrate kochia fuel breaks would be created where feasible below 4,500 feet elevation up to 200 feet each side of the road and primarily in association with WUI areas. The implementation strategy for prostrate kochia fuel breaks will involve the following treatments:

- 69 miles and 3,327 acres (85% BLM lands & 15% other lands)
- Disk 50 feet each side of road (100 feet total) in May/June and October/November 2016 for seedbed preparation
- Broadcast seed prostrate kochia in disk lines December 2016-February 2017
- Increase fuel break width by 50 foot increments (100 total) in subsequent years until maximum fuel break width (400 feet total) is achieved – approximately 5 years
- Monitor for success
- Retreat as necessary
- Apply pre-emergent herbicide as necessary (fall application)

Natural Fuel Breaks

Natural fuel breaks consist of areas where natural recovery of native perennial vegetation is likely and seeding would be unnecessary. The implementation strategy for natural fuel breaks will involve the following:

Unburned Areas

- All areas above 5,000 feet up to 200 feet each side of roadway
- 62.5 miles and 3,027 acres (58% BLM lands & 42% other lands)
- Spring of 2016 - remove woody vegetation (i.e., shrubs and trees) up to 200 feet on both sides of roads
    - hand cutting or mowing, generally to 6-12 inches
    - woody materials will be chipped and hauled off site
- Fall of 2016 - apply pre-emergent herbicide up to 200 feet to each side of roads to control annual grasses and release perennial species; retreat in subsequent years as necessary

Burned Areas

- As woody vegetation returns, remove by hand cutting or mowing up to 200 feet on both sides of roads

Seeded Fuel Breaks (other than kochia)

Seeded fuel breaks consist of areas where natural recovery of native perennial vegetation is unlikely and seeding perennial species would meet fuel break criteria.

Unburned Areas

- All areas below 5,000 feet up to 200 feet each side of roadway
- 172.5 miles and 8,137 acres (80% BLM lands & 20% other lands)
- Spring of 2016 - remove woody vegetation (i.e., shrubs and trees) up to 200 feet on both sides of roads
    - hand cutting or mowing, generally to 6-12 inches
    - woody materials will be chipped and hauled off site
- Fall of 2016 - apply pre-emergent herbicide up to 200 feet to each side of roads to control annual grasses and release perennial species
- Fall of 2017 - broadcast and/or drill seed native and/or non-native perennial grasses

Burned Areas

- Fall 2016 - pre-emergent herbicide up to 200 feet to each side of roads will correspond with ESR recommended treatments
- Fall of 2017 - broadcast and/or drill seed native and/or non-native perennial grasses commensurate with ESR recommended treatments
- As woody vegetation returns, remove by hand cutting or mowing up to 200 feet on both sides of roads

Seeded Fuel Break Criteria and Species Information

The most effective characteristics for fuel break vegetation include (St John and Ogle 2009):

- adapted or adaptable to the site
- competitive with annual grasses and forbs
- easy to establish
- low stature with an open canopy
- resilience and regrowth capabilities after fire and grazing
- reduce fuel accumulation and volatility
- retain moisture and remain green through the fire season

To enhance establishment potential, cultivars specifically developed for use within the area would be selected. Establishment of fuel break specific vegetation requires reduction or elimination of existing vegetation to decrease competition. Methods that may be used for seedbed preparation include disking and herbicide application. Equipment selection would be dependent on soil type and seed requirements to ensure seeds are deposited at the required soil depth.

Prostrate kochia is a semi-evergreen sub-shrub originating from central Eurasia. It is well adapted to arid regions and has been effectively used across southern Idaho for almost thirty years, including several fuel break projects around Boise and Mountain Home (Pellant 1992; Harrison et al. 2002). Prostrate kochia re-sprouts from the base following fire (McArthur et al. 1990, Harrison et al. 2002) and is competitive against invasive annual grasses and forbs (Tilley et al. 2012).

Sandberg bluegrass is a short-statured, native perennial bunchgrass that perpetuates itself through prolific seed set and shatter. Sandberg bluegrass initiates growth early in the spring, around the same time as cheatgrass. It increases in density under heavy grazing and is an early colonizing species on disturbed sites; it occupies interspatial areas in plant communities, which can deter encroachment of cheatgrass (Monsen et. al., 2004, Davies and Svejcar, 2008). Sandberg bluegrass is a common grass in the project area and across southern Idaho.

Bottlebrush squirreltail is a mid-statured native perennial bunchgrass. Its persistence in a plant community is dependent on its ability to reseed itself. Bottlebrush squirreltail occurs naturally throughout the project area and cultivars are available that are adapted to the project area. This species germinates in fall or spring, initiates annual growth in early spring and does not enter complete dormancy in summer, remaining partially green throughout summer and into the fall.

Crested wheatgrass is a non-native perennial bunchgrass adapted to the project area. It has been used across southwest Idaho for many years. Crested wheatgrass remains green into the growing season and tends to exclude competition from other plants in established stands, developing wide spacing between the plants once established, making it a beneficial species in fuel breaks.

Fire Suppression Damage

Damage occurring to resources as a direct result of fire suppression actions has been identified within this document and is primarily a result of dozerline construction. Mitigation actions respective to recreation and archeology have been identified under those sections. Outside of these two disciplines, several miles and hundreds of acres of dozerline rehabilitation that occurred on private, state, and federal lands still needs to be assessed. The owners of these affected lands need to be identified and contacted. A determination will need to be made if those affected lands will receive separate seeding treatments with pre-identified seed mixes. Table 20 identifies the total miles, acres and ownership of all lands affected by fire suppression dozerline to date. Additional dozer lines are being identified and will be field-verified prior to treatments.

Table 20: Fire Suppression Dozerline Impacted Lands

State	Surface Ownership	Total Acres	Total Miles
ID	BLM	296	61
ID	PRIVATE	43	9
ID	STATE	19	4
Idaho TOTAL		**358**	**74**
OR	BLM	194	20
OR	PRIVATE	22	3
OR	STATE	12	2
Oregon TOTAL		**228**	**25**

State	Totals All	Total Acres	Total Miles
ALL	BLM	490	81
ALL	PRIVATE	65	12
ALL	STATE	31	6
All TOTAL		**586**	**99**

OREGON

Riparian and Aquatics

In the state of Oregon the Soda fire burned within the Middle Snake-Succor Sub-basin affecting all or a portion of the following sub-watersheds (6th field Hydrologic Unit Code (HUC)): South Alkali Creek-Succor Creek, Camp Kettle Creek-Succor Creek, Board Corral Creek-Succor Creek, Sage Creek, Pole Creek-Succor Creek, Upper Jump Creek, Spring Creek-Succor Creek, McBride Creek, Dry Creek, Mine Basin Creek-Succor Creek, Deadman Gulch-Succor Creek.

In Oregon, within the fire perimeter, there are 19.8 (4.8 BLM) miles of perennial streams and 160.5 (143 BLM) miles of intermittent/ephemeral streams. The 4.8 miles of perennial stream that occur on BLM managed lands are primarily on Succor Creek and its tributaries in the northeast portion of the fire. Succor Creek has a diverse and dense riparian plant community. The fire did not burn appreciably into the riparian zones of Succor Creek, a perennial fish bearing stream. No Proper Functioning Condition (PFC) Inventory exists within the fire perimeter for Vale BLM.

Succor Creek provides habitat for inland redband trout (*Oncorhynchus mykiss gairdneri*), a BLM tracked species and state sensitive - critical species in Oregon. In addition, Carter Creek located outside of the fire perimeter is also designated as current distribution. McBride Creek and other perennial tributaries of Succor Creek are considered historic distribution.

The biggest threat to the values at risk is the elevated levels of erosion leading to sediment making its way into the streams and drainages. The probability of the streams receiving elevated levels of sediment is likely however the level of consequence is low as this is seen as a short term effect until perennial vegetation re-establishes within a year or two. In addition the majority of riparian vegetation along Succor Creek was not drastically affected by the fire which will help to trap sediment and maintain stable banks.

No specific areas have been identified as needing erosion control structures. Drainages and streams are expected to recover on their own. In the short term it is expected to see elevated erosion levels until desirable perennial vegetation returns. Herbicide treatments with the chemical imazapic would help control the spread of invasive annual grasses as described in the Noxious and Invasive Weeds section

Treatments

R11 Facilities; BAR Issue 4 - Repair or Replace fire Damaged Facilities
Clean outs already identified in the Rangeland Management section.

Wildlife

Greater Sage-grouse

Within the fire perimeter 34,148 acres were designated as Preliminary Priority Habitat (PPH) and 15,954 acres were designated as Preliminary General Habitat (PGH) for sage-grouse. There are two sage-grouse leks present within the burn perimeter which are designated as Unoccupied pending and Historic. An Unoccupied-pending lek as defined by Oregon Department of Fish and Wildlife is a lek not counted regularly in a seven year period, but birds were not present at last visit. These leks should be resurveyed at a minimum of two additional years to

confirm activity. A historic lek as defined by ODFW is a lek that has been unoccupied prior to 1980 and remains so. Most of the fire is also within the Owyhee North Fire and Invasive Assessment Tool (FIAT) Project Planning Area and the Cow Lakes Priority Area of Conservation (PAC). A few small, unburned islands of sagebrush within the fire perimeter may provide short-term refuge for some sage-grouse, but the wildfire killed the vast majority of sagebrush plants. The burned area now provides virtually no cover and forage for this species. Most individuals that survived the fire and avoided predation immediately after the fire have been displaced into sagebrush steppe outside the fire perimeter. Sage-grouse may find limited forage near the edge of the fire, but most individuals are expected to avoid the area, especially during the winter months, until the sagebrush recovers to the extent it once again provides adequate hiding cover and forage. Sage-grouse have been observed returning to leks in burned areas in subsequent seasons, but the size of the area burned in the Soda fire and distance to sagebrush cover would be expected to diminish or possibly eliminate use of existing leks in the burned area for several years or decades. In order to restore sagebrush for sage-grouse it is proposed to plant sagebrush plugs and/or bare root seedlings in key areas, including near lek sites on 1,500 acres.

Other Wildlife

A variety of wildlife species could utilize suitable habitat within the affected area on a seasonal or yearlong basis. Many mammal species and several reptile and amphibian species can typically be found in sagebrush habitats, grasslands, and riparian areas within the affected area. Wildlife such as mule deer, pronghorn antelope, and other ungulates in the area may utilize small unburned islands, edges of the burn perimeter, and areas adjacent to water sources in search of forage, but most ungulates were displaced by the loss of vegetation in the burned area. Ungulates and many other generalist and grassland adapted wildlife species would be expected to return the following spring as grasses and other herbaceous plants quickly recover providing suitable habitat. Many wildlife species, including mule deer and pronghorn, would be expected to gain some temporary benefit from the fire due to increased forage from higher proportions of grass and forb cover in burned areas. Sagebrush and bitterbrush require decades to recover, providing adequate structure, and diversity, thermal and hiding cover for wildlife species in the area. A significant portion of old growth bitterbrush was consumed by the fire. In order to restore wildlife habitat sagebrush plantings are proposed on 1,500 acres and antelope bitterbrush plantings are proposed on 300 acres. Areas planted with bitterbrush seedlings would be protected until established from wildlife and livestock with a temporary eight foot protective fence.

Treatments

S4/R4 Seedling Planting; ES Issue 3 - Habitat for Threatened and Endangered Species
BAR Issue 1 - Lands Unlikely to Recover

Approximately 80,000 sagebrush seedlings will be planted on 1,500 acres within the burned area over the next three years. The planted seedlings will be a combination of containerized and bare-root stock of the appropriate species. Planting will occur in both fall and spring. Planting areas and preferred species for each site will be identified by local field office biologists and ecologists. Field office personnel will also assist with adjustments to the planting strategy based on monitoring of the burned area. The objective of sagebrush seedling plantings will be to immediately increase the suitability of habitat surrounding occupied leks and late brood rearing areas damaged by the fire. Initially targeted planting areas will focus on suitable areas within three miles of leks and utilized seeps, springs, and streams. Planted seedlings will provide and enhance nearby cover and foraging habitat for sage-grouse during the breeding and late brood rearing season.

Approximately 14,000 seedlings of bitterbrush will be planted on 300 acres over the next three years. The planted seedlings will be bare-root stock and planting will occur in both the fall and spring. Identification

of targeted planting areas and adjustments to planting strategy based on field observations will be coordinated with local field office biologists and ecologists. The potential exists for fire scorched bitterbrush to re-sprout on its own or propagate from seed that may have occurred before the fire.

Based on funding and surplus stock available for purchase, numbers proposed for planting could change for each of the fall and spring planting seasons.

Table 21: Seedling Planting Commitment

Species	FY16	FY17	FY18
Sagebrush	Local seed collection and grow out	Local seed collection, grow, and plant 40,000 plugs	Plant 40,000 plugs
Bitterbrush	Local seed collection and grow out	Local seed collection, grow, and plant 7,000 plugs	Plant 7,000 plugs

R7 Fence; ES Issue 3 - Habitat for Threatened and Endangered Species
BAR Issue 1 – Lands Unlikely to Recover

Ten miles of eight foot tall wildlife exclosure fence will be built around planted bitterbrush seedlings. High rates of wildlife herbivory on planted seedlings have occurred as a result of not providing seedling protection or Vexar tubing, resulting in seedling planting failure.

Vegetation

The rangeland landscape of the southeastern Oregon cool steppe environment is a product of geological and ecological processes, as well as human impacts. Immediately prior to settlement in the late 19th century, two major vegetation types dominated the lower elevation desert up-land communities. One type was typified by big sagebrush and bluebunch wheatgrass in which dominance of sagebrush varied according to the incidence of fire and other factors. The presence of other species varied with elevation, soil, and rainfall. Sandberg bluegrass and bottlebrush squirreltail are found in drier areas, and low sagebrush occurred on shallow soil. Idaho fescue and bitterbrush reached co-dominance with bluebunch wheatgrass and big sagebrush at upper elevations and provided the understory in juniper woodlands. Other minor species included Thurber's needlegrass, prairie junegrass, needle and thread grass, and several shrubs.

The second major lower elevation steppe vegetation type, is composed primarily of shrubs, grows on alkaline soil and is dominated by shadscale and other shrubs, including spiny hopsage, winterfat, bud sagebrush, and greasewood. Bluebunch wheatgrass occurred in the understory, while larger amounts of bottlebrush squirreltail and Indian ricegrass dominated on sandy soils.

The burn area is dominated by sagebrush/native bunchgrass communities. Big sagebrush/bunchgrass communities are the most widespread type within the burned area, with basin big sagebrush growing on deep alluvial soils, and Wyoming big sagebrush growing on well-drained soils at middle to lower elevations. Low sagebrush/bunchgrass communities dominate on shallow soils that are stony or clayey. Perennial grassland communities do not form a major climax vegetation type though they do dominate for a period following fire when the shrub component is eliminated. Historically, sagebrush/native bunchgrass communities were maintained with periodic wildfire as often as every 50–100 years in sites that support Wyoming big sagebrush, to even less frequent in low sagebrush communities with limited fine fuels. As a result of the elimination of fine fuels capable of supporting fire spread, many sites currently support a community with a much greater woody species composition than was present prior to European settlement.

A number of vegetation communities are the products of past heavy grazing use, fire, or rehabilitation efforts. Shrub/annual grassland communities are the product of past disturbance where cheatgrass, medusahead wildrye and other annuals have either replaced or co-exist with the perennial bunchgrass component of a sagebrush/bunchgrass community. Increased fire frequency, supported by heavy loading of fine fuels, has resulted in areas dominated by annual grasslands with little or no shrub component. Where present in the pre-burn vegetation community, rabbitbrush has replaced other shrub species in the overstory of sagebrush/bunchgrass communities for a period following fire. Seedings of crested wheatgrass and other introduced perennial species, with varying amounts of sagebrush and other shrub overstory, have been completed to rehabilitate and stabilize some low-seral sagebrush/bunchgrass communities.

Table 22: Soda Fire Vegetation Communities (Oregon only)

Vegetation Type	Associated Species	Approximate Acres	Percent of Fire
Big sagebrush/perennial grassland	Wyoming big sagebrush, basin big sagebrush, mountain big sagebrush, antelope bitterbrush, bluebunch wheatgrass, Idaho fescue, Thurbers needlegrass, Sandberg bluegrass, basin wildrye, bottlebrush squirreltail, arrowleaf balsamroot, phlox	30,000	57%
Low sagebrush/grassland	Low sagebrush, bluebunch wheatgrass, Thurber needlegrass, Idaho fescue, cheatgrass, biscuitroot, Sandberg bluegrass	5,000	10%
Big sagebrush/annual grassland	Big sagebrush, cheatgrass, tumble mustard, clasping pepperweed, foxtail barley, Sandberg bluegrass	5,000	10%
Annual grassland	Cheatgrass, foxtail barley, sixweeks fescue, Sandberg bluegrass, tumble mustard, clasping pepperweed	9,000	17%
Salt desert shrub/grassland	Shadscale, saltbush, bud sagebrush, fourwing saltbush, spiny hopsage, horsebrush, winterfat, bottlebrush squirreltail, saltgrass, basin wildrye	500	1%
Crested wheatgrass	Crested wheatgrass	2,800	5%

The portion of the Soda fire that burned through Oregon generally burned at a low intensity. This was confirmed by the BARC photography and on-site visits where many islands of unburned vegetation were observed as well as partially burned sagebrush. Examination of the perennial grass showed little damage to the crowns and high likelihood of survival. Observations also showed that both medusahead wildrye and cheatgrass where common in the area, especially in the southern area that burned west of Highway 95, along roads and other high livestock use areas such as near reservoirs. The elevation of the burned area ranges from over 5,000 feet on Pole Top table to less than 2,600 feet in the extreme northern reaches of the burn. Nearly 75 percent of the area lies above 4,000 feet and should recover quickly especially if the medusahead wildrye is treated. One area, which is estimated at 365 acres in size, has been identified as a possible location to drill with native grasses if the perennial bunchgrasses do not recover as anticipated. The area would be monitored in spring/summer 2016 to assess condition of the bunchgrasses. Areas between 2,600 and 4,000 feet in elevation are much less resilient and will require greater intervention to rehabilitate. Drill seeding with a drought tolerant native/non-native mix has been identified on approximately 3,850 acres. These seedings would occur in fall 2016, one year after it has been treated with imazapic. The road leading to one of the drill units is in poor enough condition that drill equipment cannot be mobilized to the site, five miles of road needs heavy maintenance to safely mobilize the equipment. The likelihood

of rehabilitating these areas would improve if the most drought resistant, non-native, perennial species are drill seeded.

Treatments

S2 Ground Seeding; ES Issue 3 - Habitat for Threatened and Endangered Species

Approximately 4,215 acres will be drill seeded using standard rangeland drills, without depth bands, in the fall 2016 following a 2015 fall imazapic treatment.

S8 Road/Trail; ES Issue 3 - Habitat for Threatened and Endangered Species

Maintenance of five miles of road for rangeland drill access.

Table 23: Drill Seed Lower Elevations Native/Non-native Mix

Species	Seeding Acres	Bulk Lbs/ac	PLS Lbs/ac	% of Mix (Bulk Lbs/ac)
Snake River wheatgrass *Elymus wawawaiensis*	3850	5.5	4.68	51
Siberian wheatgrass, Vavilov II *Agropyron fragile*	3850	4.5	3.23	42
Munro's globemallow *Sphaeralcea munroana*	3850	.25	.17	2
Basalt milkvetch *Astragalus filipes*	3850	.5	.23	5
TOTAL	3850	10.75	8.08	100

Table 24: Drill Seed Higher Elevations Native Mix

Species	Seeding Acres	Bulk lbs/ac	PLS lbs/ac	% of Mix (bulk lbs/ac)
Bluebunch wheatgrass, Anatone *Psuedoroegneria spicata ssp. spicata*	365	7	5.36	70
Bottlebrush squirreltail, Vale *Elymus elymoides*	365	2	1.35	20
Sandberg bluegrass, Vale *Poa secunda*	365	.25	.18	2
Munro's globemallow *Sphaeralcea munroana*	365	.25	.17	2
Western yarrow *Achillea millefolium var. occidentalis*	365	.1	.08	1
Basalt milkvetch *Astragalus filipes*	365	.5	.23	5
TOTAL	365	10.1	7.37	100

Special Status Plants

Thirteen occurrences of three different species of special status plants are located within the Soda fire perimeter. Table 25 identifies the species and their habitats. Due to the harsh soils (ash and clay outcrops) these plants grow, on there is little vegetation present at the sites that would carry fire, or sustain fire for a period of time that would damage the plants. There is no anticipation of direct or indirect effects to the plants because of the fire.

No issues or treatments were identified or treatments proposed within the special status plant sites.

Table 25: Special Status Plant Occurrences within the Soda Fire

Species Name	Common Name	Number of Occurrences	Habitat
Astragalus cusickii var. *sterilis*	sterile milkvetch	8	ash bluffs
Trifolium owyheense	Owyhee clover	1	loose talus or ash slopes
Mentzelia mollis	smooth mentzelia	4	clay and volcanic ash deposits

ACECs

The Coal Mine Basin ACEC/Research Natural Area (RNA) is within the Soda fire burn perimeter. The 755 acre Coal Mine Basin ACEC/RNA lies on the Oregon/Idaho border between Marsing, Idaho and Jordan Valley, Oregon. The extensive and colorful ash beds in Coal Mine Basin contain diverse plant communities: one special status plant (smooth mentzelia) and a former special status plant (Cusick's chaenactis); highly scenic vistas; and fossils of both vertebrate animals and plants. The area has been recognized by BLM offices in both Oregon and Idaho as representing excellent examples of typical Succor Creek ash habitat for the special status plant, as well as a full complement of the more common, but also plants with high habitat specificity, ash outcrop species. Towering ash cliffs, colorful ash formations, and unique outcrops provide unusual scenic vistas for the area.

The relevant and important values for Coal Mine Basin are: smooth mentzelia (*Mentzelia mollis*), Cusick's chaenactis (*Chaenactis cusickii*), the ash plant community, and paleontological resources.

Due to the sparse vegetation on the ash outcrops, the fire did not burn the relevant and important values of Coal Mine Basin ACEC/RNA. There is little concern of the fire altering or degrading the relevant and important values of the ACEC/RNA. Implementation monitoring is needed to ensure the values are not inadvertently impacted. No other treatments are proposed in the ACEC/RNA.

Treatments

S13 Monitoring; ES Issue 5 - Noxious Weeds and Invasive Species

Establish three monitoring plots within the ACEC under normal ESR monitoring protocol for three year period to monitor for post fire changes to area.

Cultural Resources

The Oregon portion of the Soda fire, 47,910 acres, burned over known cultural resource surveys encompassing 7,057 (14.7%) surveyed acres. While many portions of the area have been surveyed for cultural resources, there is a significant amount of land that has not (85.3%). The prehistoric sites include artifact isolates, artifact scatters, bedrock grinding features, hearths, middens, rock shelters, rock art, and other features associated with habitation sites. A multitude of sites are situated within the burned areas of the Soda fire. Also included are areas designated as sacred places and areas of cultural significance by the local tribal communities. Information regarding known sites is included in the administrative record for this project.

Paleo Lands

The Great Basin was a land abounding in water 1.8 million to 12,000 years ago. Glaciers slowly advancing from the bordering Wasatch Mountains and taller ranges inside the basin, left terminal moraines at valley margins. The remains of a menagerie of large Pleistocene animal are embedded in sediments within the APE.

Historic

Camp Lyons to Jordon Valley historic trail, located west of the highway, about one mile on the south bank of Cow Creek, is the site of Camp Lyon, named in honor of Idaho's second Territorial Governor and Superintendent of Indian Affairs, Caleb Lyon in 1865. Camp Lyon was one of the most active military posts in eastern Oregon and the headquarters of the first Oregon cavalry during the troubled 1860's when cavalry troops were dispatched attempting to subdue Indian tribes. Although this site was located with the Soda fire perimeter it had lost visual and surface integrity prior to the fire.

Values at Risk – Oregon Cultural Resources

- The fire eliminated vegetation and loosened the top soils making cultural sites highly susceptible to erosion, flooding, and landslides. Post fire erosion factors are a high risk.
- Archaeological site exposure is a concern since the fires may have created easy access to these sites by removing the thick vegetation cover. As a result vandalism and pot-hunting are obvious concerns. Post-fire looting and vandalism are a high risk.
- GIS maps have been assessed regarding damages that may have ensued during fire suppression activities, such as the cutting of fire breaks by bulldozers. The potential for on-the-ground differences from the GIS mapping scale may differ, as such; fire suppression disturbances are considered a high risk.
- Excessive levels of heat from wildfire can damage, break and destroy cultural artifacts. Burn intensities on the Oregon side of the Soda fire were assessed with the BARC map and did not reach the high level making the risk level low.

A Class III cultural resources inventory of the Soda fire APE is planned for all ground disturbing proposals. The cultural survey design will be created to provide cultural site data relating to:

- Physical evidence that includes: presence/absence, location, site density and type.
- Social, political spiritual and religious cultural factors
- Paleo land surfaces were included in the survey objectives

Table 27: Proposed Activities Listed by Ground Disturbance

Ground Disturbing Activities (high risk)	Non-Ground Disturbing Activities (low risk)
Clean-out (same footprint) seven reservoirs	Stabilizing and concealing cultural sites
Sagebrush and bitterbrush plug planting	Pre-emergent herbicide applications
Temporary protective fence exclosures	Domestic grazing closure
Ground seeding with dozers and seed drills and harrows	Anti-looting signage and monitoring
	Update existing cultural site forms identifying spatial density, post-fire condition and eligibility determinations
	Short and long term law enforcement patrols for cultural and paleo sites
	Repair/replace range fence
	Erosion control using wattles, straw bales, etc.

Threats to Values at Risk – Oregon Cultural Resources

A Class III cultural resource inventory will be completed to assess the proposed environmental stabilization measures and the effects on archaeological resources prior to any ground disturbing activities. Complete site avoidance is the preferred form of treatment for archaeological resources that have the ability, or may have the ability, to yield scientific data.

The Archaeological Resource Protection Act (ARPA) (16 U.S.C. 470aa-470mm; Public Law 96-95 and amendments to it). ARPA mandates the regulation of legitimate archeological investigation on public lands and the enforcement of penalties against those who loot or vandalize archeological resources with larger financial and incarceration penalties for convicted violators.

The proposed non-ground disturbing and monitoring activities will not directly or indirectly affect any eligible or potentially eligible cultural sites as per the Oregon State Historic Preservation Office and the BLM Oregon Washington State SHPO 2015 Protocol.

Indirect effects from the proposed ground disturbing activities identified in the emergency stabilization and rehabilitation actions support the cultural resource management direction identified in the SEORMP (2002). Cultural resources will benefit by establishing an adequate vegetative cover that will decrease artifact exposure, illegal collection and theft potential. Managing the fire influenced areas by re-vegetating the bare soil also decreases the potential for ground/site erosion, meets the intent identified in the SEORMP, Cultural Resources, Objective 1. Protect and conserve cultural and paleontological resources.

Treatments

- **S9 Ground Seeding; ES Issue 4 – Cultural Heritage Resources**
  Assess cultural sites and determine if future treatments are needed. Ground seed high risk sites to camouflage artifacts and limit erosion. Recommendation is based on GIS analysis of sites having significant elements combined with those on >25 degree slope and/or near main roads within moderate to high intensity burn GIS data, and as determined by past or post-fire observations of looting, erosion, and fire effects. Sites include open lithic scatters and rock shelters with significant cultural elements.

- **S9 Cultural Protection; ES Issue 4 – Cultural Heritage Resources**
  Law enforcement patrols of sites most at risk from looting based on their values, location, visibility from roads, degree of vegetation loss, and known past issues in the area. Patrols should increase from that which occurs on a normal basis, particularly during high-use seasons, until vegetation has recovered sufficiently to camouflage artifacts.

- **S9 Cultural Protection; ES Issue 4 – Cultural Heritage Resources**
  Installation of 30-40 anti-looting signs will occur inside and outside of the APE.

Noxious and Invasive Weeds

There are scattered populations of noxious weeds in the burned area and in the general vicinity of the fire, including:

- Several small sites of Russian knapweed (*Acroptilon repens*) along the many two-track roads generally north of Antelope Springs between the state line and Succor Creek and heaviest on private land along Succor Creek (< 2 acres)

- Spotted knapweed (*Centaurea stoebe*) in Succor Creek State Park and along Hwy 95 north of Cow Creek (< .5 acres)
- Scattered diffuse knapweed plants (*Centaurea diffusa*) occur along Hwy 95 north of Cow Creek (<.5 acres)
- Yellow starthistle (*Centaurea solstitialis*) is known at the confluence of Sage Creek at the north end of Succor Creek State Park, on state park land north of the park, and was eradicated from a small site on McBride Creek Road (<.5 acres)
- Leafy spurge (*Euphorbia esula*) is known to be around the Sheaville Pit Reservoir near the Delmar Mine Road and the surrounding area, as well as isolated sites to the north of that site. Treatments have been ongoing (+/- 1 acre)
- Linear strips of jointed goatgrass (*Aegilops cylindrica*) follow the Rockville road a short distance West of Hwy 95 and can also be found on the north end of the burned area, east of Succor Creek (<2 acre)
- Saltcedar (*Tamarix ramosissima*) is associated with Succor Creek and small seeps on the north end of the fire (<.25 acres)
- Perennial pepperweed (*Lepidium latifolium*) occurs along Succor Creek in the state park and small sites at two reservoirs on the north end of the fire (<.1acres)
- Whitetop species (*Lepidium* ssp) is a problem species along roads and in much of the lowlands along Succor Creek in the state park and on the east side of the creek (approximately 2 acres)
- Rush skeleteonweed (*Chondrilla juncea*) is near the Oregon border north of McBride Creek Road as well as on west side of the state park. It has been reported in Spanish Charlie Basin, but not confirmed (<.1 acre)
- Halogeton (*Halogeton glomeratus*) is scattered along roads around Graveyard Point and has the potential to spread back into the fire boundary by vehicle traffic (>1 acres)
- Scotch thistle (*Onopordum acanthium*) is also scattered along roads and dots most of the road systems with single plants to larger populations (>2 acre)
- Canada thistle (*Circium arvense*) and bull thistle (*Circium vulgare*) show up in small populations in moist sites and along Succor Creek (<.2 acre).

Medusahead rye (*Taeniatherum caput-medusae*) is increasing within and around the burned area. Populations are most dense in the lower elevations above the Succor Creek bottomland and gradually decrease up to the rims that separate the good condition rangelands on the higher hills and flat top mesas. Isolated populations are beginning to encroach on these good condition rangelands from Cow Creek road in the south, to Pole Creek Top, above McBride Creek, and on north to near Graveyard Point, especially around disturbed areas, including reservoirs, and along roads.

To know the full extent and variety of noxious weeds present, a more thorough survey needs to be completed when weeds appear after moisture this fall or during next spring's growing season. Dozer/grader activity and other fire suppression traffic would exacerbate spread of any of these noxious and/or invasive weeds, especially invasive grasses.

Other invasive annual species that increase following fire are cheatgrass and various annual mustards, including tumble mustard (*Sisymbrium altissimum*), Russian thistle (*Salsola kali*) etc., which are scattered throughout the area. These species would also be controlled by imazapic treatments.

Weed control within the burned area and a buffered area outside would help prevent invasive/noxious species from dominating the site and encroaching from exterior edges. If not controlled, invasive/noxious species would suppress recovery of desired vegetation and further degrade sage-grouse and other wildlife habitat. These species are poor forage for wild horses and livestock and can be a threat to sensitive plant populations. Most weeds recover more

quickly than native or other non-native desirable perennials, take advantage of moisture and nutrients earlier, and proliferate following wildfire.

Treatments

S5/R5 Noxious Weeds; ES Issue 5 - Noxious Weeds and Invasive Species
BAR Issue 2 – Noxious Weeds and Invasive Species

- During fall 2015, aerial application of approximately 24,200 acres in order to reduce medusahead wildrye and other noxious weeds or invasive annual grass species.
- Inventory 15,000 acres for noxious weeds and invasive species; treat approximately 20 acres by ground methods including ATV and backpack sprayers.
- Monitor areas for re-treatment of remaining noxious weeds or additional treatment of new noxious weed sites. Species to be included on the monitoring plan are: Russian knapweed, spotted knapweed, diffuse knapweed, yellow starthistle, leafy spurge, jointed goatgrass, saltcedar, perennial pepperweed, whitetop, rush skeletonweed, halogeton, Scotch thistle and Canada thistle.

Future Projects

- Additional areas will be evaluated for future imazapic treatments.

Wild Horse and Burro HMAs

The Three Fingers Herd Management Area (HMA) is located approximately six miles west of the Soda fire perimeter. Cumulative economic impacts in this area affect one grazing permittee and consist of livestock grazing reductions in the area because of the Soda fire, the 2013 Owyhee fire, and no reduction of wild horses in the Three Fingers HMA prior to or after these fires.

Due to the Owyhee fire in 2013, the permitted livestock use in the Board Corrals allotment was reduced for the 2014 and 2015 growing seasons for a total reduction of 2588 AUMs. The Soda fire livestock grazing reductions will consist of an additional 2303 AUMs from this permittee. To date, the wild horse numbers in the adjacent Three Fingers HMA were not reduced resulting in over grazing within the HMA and wild horses being pressured to graze outside the HMA in the burned areas closed to livestock grazing . Currently the number of horses in the HMA is exceeding the Appropriate Management Level (AML) of 75-150 horses, resulting in the permittee voluntarily reducing another 1000 AUMs.

Because of these cumulative impacts and issues as well as following sage-grouse management direction, the Vale BLM is requesting to gather excess wild horses from the Three Fingers HMA.

Treatments

S14 (Other Treatments) Wild Horse and Burro Gather; ES Issue 2 - Soil/Water Stabilization
Gather and remove approximately 100 horses from the Three Fingers HMA. This treatment would reduce competition for forage with wildlife, reduce the inevitable over use of the burned area and increase the rate of recovery of sage-grouse habitat. This will return the HMA to AML levels.

Rangeland Management

In Oregon the Soda fire burned 48,200 acres, of this, 43,108 acres are public lands administered by BLM Oregon and 4,105 acres administered by BLM Idaho within the Strodes Basin allotment, 4,526 of private land including 40 acres within the Strodes Basin allotment, 202 acres of Oregon State Parks and 365 acres of Oregon State Lands. Public acres burned by the Soda fire will be rested from grazing for one full year and through a second growing season at a minimum, or until monitoring or professional judgment indicate that health and vigor of desired vegetation has recovered to levels adequate to support and protect up-land function.

The Soda fire impacted 4 out of 123 grazing allotments in the Malheur Resource Area (MRA) within the Vale District BLM. It burned through portions of the Board Corrals allotment, Rockville allotment, Spring Mountain allotment, and Three Fingers allotment. Fire recovery will require the reduction of permitted grazing by 5,000 AUMs per year while the burned area is rested. Approximately 50 miles of BLM livestock management fence as well as several range improvement projects were damaged or destroyed by the Soda fire. Repair or replacement of these facilities is required to facilitate future livestock management.

Treatments

S7 & R7 Fence, Gate, Cattleguard; ES Issue 2 - Soil/Water Stabilization
BAR Issue 4 - Repair or Replace fire Damaged Facilities

- Repair or replace approximately 50 miles of fire damaged fence.
- Install approximately seven miles of new temporary fence to allow for grazing on partial burned pastures and to protect treatments as needed.
- Cattle guard repair with replacement of braces and wings with clean out
- Cattle guard braces, bases and new cattle guard installation

S12 Closures; ES Issue 2 - Soil/Water Stabilization

There will be a closure of approximately 43,108 acres by grazing decision or agreement. Areas closed will be rested from grazing for one full year and through a second growing season at a minimum, or until monitoring or professional judgment indicate that health and vigor of desired vegetation has recovered to levels adequate to support and protect up-land function.

R11 Facilities; BAR Issue 4 - Repair or Replace fire Damaged Facilities

- Perform maintenance and repairs on seven reservoirs; clean out to original specifications if they become filled with large amounts of sediment. Cleaning out these reservoirs and maintaining/reconstructing them to their original specifications would ensure that livestock and wildlife have viable water sources.
- Reconstruction of two springs which includes trough and pipeline replacement.
- Develop one new spring to improve greater livestock distribution within the burned area
- Clean out five cattle guards

Fuels Reduction

Within the past five years, southeast Oregon has experienced numerous large-scale wildland fires within sage-brush steppe habitat. These fires burned hundreds of thousands of acres per burn period and each consumed an average of 264,000 acres of rangeland. Fires such as Long Draw, Holloway, Miller Homestead, Buzzard Complex, Soda, and Bendire have combined to burn over 1.5 million acres since 2012. A system of fuel breaks designed to be consistent with those proposed on the Idaho side of the Soda Fire is proposed to protect ESR investments, adjacent

sage-grouse habitat, and the Wildland Urban Interface (WUI). The Soda fire burned approximately 241,170 acres within the Northern Owyhee FIAT Project Planning Area identified in 2015. Approximately 218 miles of linear fuel treatments (fuel breaks) were identified within and adjacent to the Soda fire perimeter in Oregon.

Fuel breaks INSIDE Oregon portion of Soda fire perimeter (69 miles): would protect ESR treatments and recovering vegetation from fires originating from nearby WUI areas and adjacent roads outside the fire perimeter, as well as manage fires that originate inside the fire perimeter, thus protecting ESR investments.

Treatments

S8 Road/Trail Water Diversion; ES Issue 5 - Noxious Weeds and Invasive Species

Current treatments (within 3 years)

- Re-establish ditches on roadsides using graders, blades, etc.
    - Gravel in and/or keep bare (scraping and/or chemical treatment) 15 feet on both sides of road

- Chemically treat up to 200 feet maximum to both sides of road
    - Pre-emergent herbicide targeting invasive annual grasses (imazapic)
    - Contact foliar herbicide targeting broadleaf weeds (2,4-D) – spot treatment for noxious weeds

- Seed native and/or non-native species, or combinations thereof (depending on site), to establish a perennial plant component that meets fuel break criteria (see Attachment 1)
    - <4,500 feet: prostrate kochia (esp. adjacent to WUI areas)
    - >4,500 feet: Sandberg bluegrass, bottlebrush squirreltail, crested wheatgrass, (others: Snake River wheatgrass, forbs?) (Note: These spp. may also be used where appropriate below 4,500 feet)

- Maintain roads (other than fuel breaks) to facilitate fire suppression operations/access

Future treatments (>3 years)

- Maintain ditches 15 feet on both sides of road
- Continue herbicide treatments as necessary
- Re-seed as necessary
- Maintain roads other than fuel breaks for fire suppression access
- Remove all brush ("brush out") up to 200 feet maximum on either side of road
    - Mow or hand cut – depending on site
    - Terrain and resource concerns dictate fuel break width (e.g., riparian areas)
    - A minimum 25-foot buffer (or where greenline vegetation intersects fuel break) along riparian features to protect from erosion

Fuel Breaks OUTSIDE the Oregon portion the Soda fire perimeter (149 miles): Fuel breaks outside the perimeter would protect WUI areas and adjacent unburned vegetation/habitat from fires originating within the fire perimeter, as well as manage fires that originate outside fire perimeter that may threaten ESR treatments and recovering vegetation inside the fire perimeter.

Treatments

S8 Road/Trail Water Diversion; ES Issue 5 - Noxious Weeds and Invasive Species

Current treatments (within 3 years)

- Re-establish ditches 15 feet on both sides of road (see above)
- Remove all brush up to 200 feet maximum on either side of road (see above)
- Chemically treat up to 200 feet maximum on either side of road (see above)
- Seed up to 200 feet maximum on either side of road (see above)

Future treatments (>3 years)

- Maintain borrow pits 15 feet on both sides of road (see above)
    - Remove all brush up to 200 feet maximum on either side of road (see above)
    - Continue herbicide treatments as necessary up to 200 feet maximum on either side of road (see above)
- Re-seed as necessary up to 200 feet maximum on either side of road (see above)

For fuel break implementation details reference the Idaho Fuel Breaks section.

Native/Non-Native Plants Worksheet

Table 28: Proposed Plant Species for All Combined Treatments

Native Species	Non-Native Species
Grasses	**Grasses**
Basin wildrye	Crested wheatgrass
Bluebunch wheatgrass	Siberian wheatgrass
Bottlebrush squirreltail	Triticale
Idaho fescue	
Sandberg bluegrass	
Snake River wheatgrass	
Streambank wheatgrass	
Thickspike wheatgrass	
Forbs	**Forbs**
Arrowleaf balsamroot	Alfalfa
Basalt milkvetch	Small burnet
Fernleaf biscuitroot	
Globemallow spp.	
Penstemon spp.	
Western hawksbeard	
Western yarrow	
Shrubs	**Shrubs**
Antelope bitterbrush	Forage kochia
Basin big sagebrush	
Low sagebrush	
Wyoming big sagebrush	

A. Proposed Native Plants in Seed Mixtures (Both ES & BAR Treatments)

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

Yes Rationale:

The proposed native species are adapted to the ecological sites within the proposed treatment areas and many were common in pre-burn monitoring. These species have been extensively utilized in similar ecological sites throughout the Boise District. Ecological site descriptions, provisional seed zone information, monitoring data and local specialists were utilized in species selection. Locally collected seed is being utilized to the extent that it is available. Local collections will also be utilized for future treatments.

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

Yes Rationale:

The native seed proposed for the treatment area is generally available in the required quantities. Species that require large quantities (grasses) are commonly used throughout the west and available from most vendors. The BLM Regional Seed Warehouse system also keeps an inventory of most of the species being proposed.

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

Yes Rationale:

All species in the mixtures are commonly planted species and the costs for native seed are considered reasonable and acceptable. Furthermore, the native seed proposed for use has been increasingly utilized in recent years for stabilization, rehabilitation, and restoration. The demand has resulted in increased production and decreased price. The costs are considered reasonable given Land Use Plan and ESR Plan objectives. A successful seeding will help to mitigate post-fire damage to rangeland health, greater sage-grouse priority and important habitat, stabilize soils, protect against erosion, and reduce the expansion of invasive annual grasses and noxious weeds.

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

Yes Rationale:

Given the elevation and annual precipitation of areas where native species are being proposed, it is expected that the native species will survive on the selected sites. Also, native species are preferable for reseeding where applicable and in some cases such as sagebrush, no introduced shrubs are available to replicate appropriate habitat. The seeding of most of the native species has been focused in areas where competition is expected to be at acceptable levels that will allow the native species to establish.

5. Will the existing or proposed land management practices (e.g. wildlife populations, recreation use, livestock, etc.) maintain the seeded native plants in the seed mixture when the burned area is re-opened?

Yes Rationale:

The seeded areas will be rested from livestock grazing to allow establishment of seeded species. Post-fire livestock grazing will be managed according to the Owyhee RMP and applicable grazing permits to maintain.

B. Proposed Non-native Plants in Seed Mixture (Both ES & BAR Treatments)

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

Yes Rationale:

The objective of the proposed introduced species is to stabilize and rehabilitate the burned area by competing with invasive species and noxious weeds while providing functional structural habitat for wildlife. Invasive species are being proposed where competition from invasive annual grasses is highest. It has been stated in the Vegetation Section that, in general, the fire did not consume the invasive annual grass seed bank. Due to erosion concerns, many areas will not be treated with imazapic in 2015 and species seeded into these sites will have to compete with invasive annual grasses still present in the seed bank. This competition from invasive annual grass would make establishment of native perennial grasses very difficult and less likely to be successful. Introduced perennial grasses are more successful at competing with invasive annual grasses and successful establishment of these species

is more likely. If establishment of perennial grass is successful but invasive annual grasses are still sub-dominant or common the area can later (2016 and/or later) be targeted for an imazapic application that would control annual grasses and release perennial vegetation.

Establishing species that will compete with invasive annual grasses and prevent a shortened fire return interval is critical to re-establishing and maintaining sage-grouse habitat. If invasive annual grasses become dominant on site they may out-compete desirable perennial vegetation and exponentially increase the cost of future, long-term restoration treatments. This treatment will reduce the cost of future restoration as well as provide and ecologically functional intermediary community.

The non-native forbs proposed in the aerial sagebrush seed mix are available in large quantities, affordable and adaptable species that are known to be preferred by sage-grouse and/or pollinators. These species have the ability to establish throughout the burned area but are unlikely to displace or dominate native species. Alfalfa and burnet have been planted throughout the Boise District and no negative impacts to native vegetation have been observed. These species provide excellent forage for wildlife, including sage-grouse, and support pollinator species.

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

Yes Rationale:

The treatment areas vary from degraded crested wheatgrass seedings to sagebrush communities with understories of perennial grasses and invasive annual grasses. The natural successional processes that normally occur within a native plant community have been altered by the introduction and establishment of invasive annual grasses such as cheatgrass and medusahead rye, as well as noxious weeds. The proposed non-native plants can effectively compete with these species. Establishing a competitive perennial plant species with a mixture of native and non-native species will promote a greater degree of resiliency within the plant community and restore more natural successional processes.

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

Yes Rationale:

The proposed introduced plant species have been used in seedings within the Owyhee Field Office for over 50 years. Many of the seedings have occurred within the burned area, where current seedings are planned, or adjacent to planned seedings. Incidental establishment of the proposed species may occur outside of the treatment area by the seasonal movement of wildlife and livestock, but this occurrence is not common nor has it been observed to result in the long-term displacement of adjacent native species or communities. Also, many of the 2015 drill seeding areas proposed for introduced species were part of a plowing and seeding project that occurred in the 1960s and currently the dominant perennial grass on site is crested wheatgrass but these areas have been heavily invaded by annual grasses as well.

Cost Risk Analysis

Idaho Cost Risk Analysis – ES and BAR and Fuels Combined

Spec #	Spec #_Treatment / Action	Type of Units	# of Units	Unit Cost	Total Costs	% Probability of Success
S1_R1	Planning (Plan Prep District Overhead)	WM	60	9,783	587,000	100%
S1_R1	Planning (Soda ESR Team)	WM	165	8,455	1,395,000	100%
S2_R2	Herbicide Application	AC	123,374	20	2,426,000	75%
S2_R2	Ground Seeding (Drill)	AC	56,317	106	5,948,000	75%
S3_R3	Aerial Seeding Grass	AC	101,691	100	10,180,000	65%
S3_R3	Aerial Seeding Shrub/Forb	AC	235,742	74	17,535,000	80%
S4_R4	Seedling Planting (Shrub/Tree)	EA	2,450,000	1.66	4,073,000	70%
S5_R5	Weed Treatments	AC	898,195	0.67	602,000	95%
S7_R7	Fence/Gate/Cattleguards	MI	400	6,255	2,502,000	100%
S8_R8	Road/Trail Water Diversion	MI	28	4,107	115,000	100%
S9_R9	Cultural Protection (Stabilization/Patrol)	AC	1300	192	249,000	90%
S11_R11	Facilities/Improvements	EA	250	200	50,000	100%
S12_R12	Closures (area, OHV, livestock)	EA	36	2,750	99,000	100%
S13_R13	Monitoring (Treatments, Grazing Resumption, AIM	AC	179,639	21	3,755,000	100%
S14_R14	Other Treatments (FIRE SUPPRESSION DAMAGE	MI	90	1022	92,000	75%
S14_R14	Other Treatments FUELS	AC	11,065	*660*	7,299,000	75%
S14_R14	Other Treatments - HAZARDOUS MATERIAL REMOVAL SQUAW CREEK				368,000	95%
S14_R14	Other Treatments - ABANDON MINE CLOSURES SHAFTS AND ADITS				51,000	100%
S14_R14	Other Treatments - WILD HORSE GATHER				369,000	95%
				TOTAL BAR & Seed	56,943,000	
				TOTAL Seed Only	25,450,850	

Oregon Cost Risk Analysis – ES and BAR and Fuels Combined

Spec #	Spec #_Treatment / Action	Type of Units	# of Units	Unit Cost	Total Costs	% Probability of Success
S2_R2	Herbicide Application	AC	51,137	46	2,370,000	75%
S2_R2	Ground Seeding (Drill)	AC	4,215	160	674,000	75%
S4_R4	Seedling Planting (Shrub/Tree)	EA	94,000	2.68	252,000	70%
S5_R5	Weed Treatments	AC	15,000	3.33	50,000	95%
S7_R7	Fence/Gate/Cattleguards	MI	17	16,118	274,000	100%
S9_R9	Cultural Protection (Stabilization/Patrol)	EA	40	850	34,000	90%
S11_R11	Facilities/Improvements	EA	7	5000	35,000	100%
S12_R12	Closures (area, OHV, livestock)	EA	4	4,250	17,000	100%
S13_R13	Monitoring (Treatments, Grazing Resumption, AIM	AC	46,314	43	2,000,000	100%
S14_R14	Other FUELS (Total)	AC	*5,287*	*870*	4,600,000	75%
S14_R14	OTHER WILD HORSE GATHER				100,000	
			TOTAL ES, BAR, FUELS & SEED		10,406,000	
			TOTAL Seed Only		856,600	

Cost Risk Summary (Idaho/Oregon combined)

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 Rationale for answer:

If the proposed treatments are completed on Hazardous Materials sites, AML sites, and transportation systems the risk to human life and safety and private property will be reduced to an acceptable level. The seeding of sagebrush, perennial grasses, and forbs will maintain sage-grouse habitat, ensure that the site is resistant to invasive annual grasses and resilient to wildfire, and maintain proper structure and function of sagebrush steppe habitat. The noxious weed treatments will help protect BLM lands and adjacent private lands against further expansion of noxious weeds. The temporary protection fence and existing fence repair will help to ensure that no disturbance from livestock occurs in the newly seeded area, and allow for long term grazing management within the burned area.

No Action No Rationale for answer:

Without the proposed treatments at the Mac D and Squaw Cr. Hazardous Materials sites there is an unacceptable risk of a large rainfall event moving contaminants off site and impacting private property. The risk to human life and safety at the AML sites will continue at current levels if treatments are not implemented. The risk of road failure and sediment damage to private property will continue at an unacceptable level if the proposed treatments are not implemented. Without the proposed seeding treatments the area will see an increase in invasive annual grasses and become unsuitable as sage-grouse habitat. Noxious weeds could expand and dominate portions of the burned area. Adjacent wildlife habitat would be compromised due to a lack of connectivity.

Alternative(s) **Rationale for answer: N/A**

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

Proposed Action **Yes** **Rationale for answer:**

The likelihood of the Hazardous Materials and AML treatments being successful is very high, and the cost is appropriate considering the risks associated with no treatment. The probability of seeding success is high. The species selected for seeding are well adapted to the site conditions with many existing on the site prior to the fire. All of the proposed species have been successfully seeded within the Boise and/or Vale Districts in the past. Bluebunch wheatgrass, Snake River wheatgrass, Siberian wheatgrass, crested wheatgrass and Wyoming big sagebrush were all successfully seeded on the Trimbly fire in 2002 and exhibited high rates of establishment. The Trimbly fire is adjacent to the Soda fire and shares the same ecological site description (Loamy 10-13" ARTRW/PSSPS) as many of the areas within the Soda fire. Early detection and treatment of noxious weed infestations is more effective and less costly than treatment of a larger infestation at a later date.

No Action **No** **Rationale for answer:**

The burned area has a high potential for expansion of invasive annuals and noxious weeds and there is a probability that over time these species could move into adjacent unburned areas. Not treating the area would also make it more susceptible to repeated burning. Because of this it is unlikely the burned area would be acceptable as sage-grouse habitat in the future.

Alternative(s) **Rationale for answer: N/A**

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

Proposed Action | X|,
Alternative(s) |__|,
No Action |__|

Comments: None

C. Risk of Resource Value Loss or Damage

No Action - Treatments Not Implemented (check one)

Resource Value	N/A	None	Low	Medium	High
Unacceptable Loss of Topsoil				X	
Weed Invasion				X	
Unacceptable Loss of Vegetation Diversity					X
Unacceptable Loss of Vegetation Structure					X
Unacceptable Disruption of Ecological Processes					X
Off-site Sediment Damage to Private Property				X	
Off-site Threats to Human Life			X		
Other-loss of Access Road Due to Plugged Culverts				X	

Proposed Action - Treatments Successfully Implemented (check one)

Resource Value	N/A	None	Low	Medium	High
Unacceptable Loss of Topsoil			X		
Weed Invasion			X		
Unacceptable Loss of Vegetation Diversity			X		
Unacceptable Loss of Vegetation Structure			X		
Unacceptable Disruption of Ecological Processes			X		
Off-site Sediment Damage to Private Property			X		
Off-site Threats to Human Life		X			
Other-loss of Access Road Due to Plugged Culverts			X		

Team Members

Idaho Team	Team Member (Agency/Office)	Initial and Date
Soda ESR Team Lead	Michele McDaniel - OFO	
ESR Rapid Response Team Lead	TJ Clifford - BFO	
Wild Horse and Burro	Chris Robbins - ISO	
Hydrology	Scott Sheppard - University of AZ	
Hydrology	Jason Williams - ARS	
GIS	Bernie Hoffman - ISO	
Planning/NEPA	Seth Flannigan - BDO	
Cultural	Kelli Barnes - OFO	
Hazardous Materials	Carrie Wontorcik - BDO	
Minerals AML	Forrest Griggs - OFO	
Recreation	Ryan Homan - OFO	
Engineering/Roads	Dave Woras - BNF	
Engineering/Roads	Dale Nichols - BDO	
Noxious Weeds	Lonnie Huter - BDO	
Wildlife	Brad Jost - OFO	
Botany/Ecology	Beth Corbin - OFO	
Riparian	Janelle Alleman - BDO	
Riparian	Scott Hoefer - ISO	
Range	Pete Torma/Mike Spicer - OFO	
Soils	Terry Hardy - BNF	
Soils	Gina Rone - ISO	
Fuels	Lance Okeson - BDO	
USFWS Liason	Jason Pyron - FWS	

Oregon Team	Team Member (Agency/Office)	Initial and Date
Range Specialist	Marcy Tiffany - MFO	
Botanist	Susan Fritts - MFO	
Noxious Weeds Specialist	Lynne Silva - MFO	
Hydrologist/Soils/Fish Biologist	Todd Allai - MFO	
Fuels Specialist	Jason Simmons - MFO	
Fuels Specialist	Don Rotell - MFO	
Wildlife Biologist	Megan McGuire - MFO	
Wild Horse and Burro Specialist	Shaney Rockefeller - MFO	
Recreation/Wilderness Specialist	Kari Points - MFO	

List of Preparers

List of Preparers	Team Member (Agency/Office)	Initial and Date
ESR Lead	Cindy Fritz - BDO	
ESR Specialist	Alex Webb - BDO	
ESR Specialist	Rob Bennett - BDO	
ESR Botanist (GBI)	Amy Stillman - BDO	
ESR Monitoring Specialist (GBI)	Helen Meier - BDO	
ESR Technician	Caleb Ashby - BDO	

Plan Approval

The Agency Administrator is responsible for developing, implementing, and evaluating emergency stabilizations and rehabilitation plans, treatments and activities. 620 DM 3.5C

/s/ Jenifer Arnold, Acting Boise District Manager *Sept. 30, 2015*

DISTRICT MANAGER - IDAHO DATE

/s/ Donald Gonzalez, Vale District Manager *Sept. 30, 2015*

DISTRICT MANAGER - OREGON DATE

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