Watershed Action Plan

To remove barriers and improve stream function
on National Forest System Lands within the

Granite Creek Watershed
(HUC 1707020202)

Approved By

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Table of Contents

Floodplain restoration removing placer tailings on Clear Creek, 2006 and 2008

Executive Summary

The theme for this "Watershed Action Plan", or WAP, is ***removing barriers and improving stream function*** to address key limiting factors to watershed and aquatic ecosystem health in the Granite Watershed. The WAP is considered a work in progress; it synopsizes current and available information, identifies critical restoration needs for the next 5 to 10 years, and sets out a recommended course of action to address key limiting factors in the near term. The action plan is both confirmation and extension of ongoing efforts to stabilize and restore degraded watershed conditions. The WAP recognizes and acknowledges past and ongoing efforts to reclaim degraded conditions but attempts to broaden this view to address "whole watershed" conditions, limiting factors, and multi-jurisdiction interests. The Umatilla and Wallowa Whitman National Forests share management responsibility for the majority of the lands in the watershed. The watershed is also within the ceded lands of the Confederated Tribes of the Umatilla Indian Reservation, a treaty tribe with strong interest in watershed and fisheries restoration and management. Other parties, including private land owners, the county, and state have many varying interests in the watershed. All have worked on watershed restoration and related actions and share common objectives for improving watershed health; however, these efforts could be better coordinated and targeted at the most critical needs.

The Granite Watershed has an extensive mining history, at one time there were 1,000s of people living and working in the drainage. Harnessing water from Olive Lake in 1908 literally supplied the power to electrify the valley and run mining operations. But mining activities severely degraded hillslopes and streams leaving persistent chemical, biological, and physical effects. Despite this Granite is recognized as a critical watershed to water quality and fish recovery in the John Day Basin. It is high elevation, headwaters which produces proportionately more cold water, and supports critical habitat for federally listed steelhead and imperiled salmon. These characteristics make Granite a "**High Risk-High Value**" watershed for restoration investment. As a result, restoration actions are intended to be focused on the most critical elements impairing function to sustain water quality and support fisheries. Specific recommended actions include: improving treatment of acid mine discharge from abandoned lode mines, targeting future mine reclamation actions more strategically, removing physical barriers to fish migration, restoring connectivity of streams and floodplains, and restoring riparian vegetation. The WAP is a summary of available information and best professional judgment to focus on critical restoration needs in coming years. It is not intended to be a comprehensive compilation of all available known information about watershed condition and restoration needs but should establish a reasonable course of action and build on existing relationships to enhance partnership opportunities and leverage funding.

The WAP is also not a decision document but does recommend appropriate types of actions to achieve specific objectives. Lastly, this WAP is a dynamic document intended to be periodically reviewed, validated, and updated.

I. Watershed Overview

The Granite Creek Watershed (HUC 1707020202) is located in northeastern Oregon (inset Figure 1). Granite Creek is a headwater tributary to the North Fork John Day River which lies within the John Day River Basin (HUC 170702). The Granite Creek Watershed is comprised of 40,857 acres on the Wallowa-Whitman National Forest (WAW), 49,262 acres on the Umatilla National Forest (UMA), and 4,407 of private land. A significant portion of the acreage (27%) in the watershed is in federally designated wilderness primarily in the northwest (lower) part of the watershed.

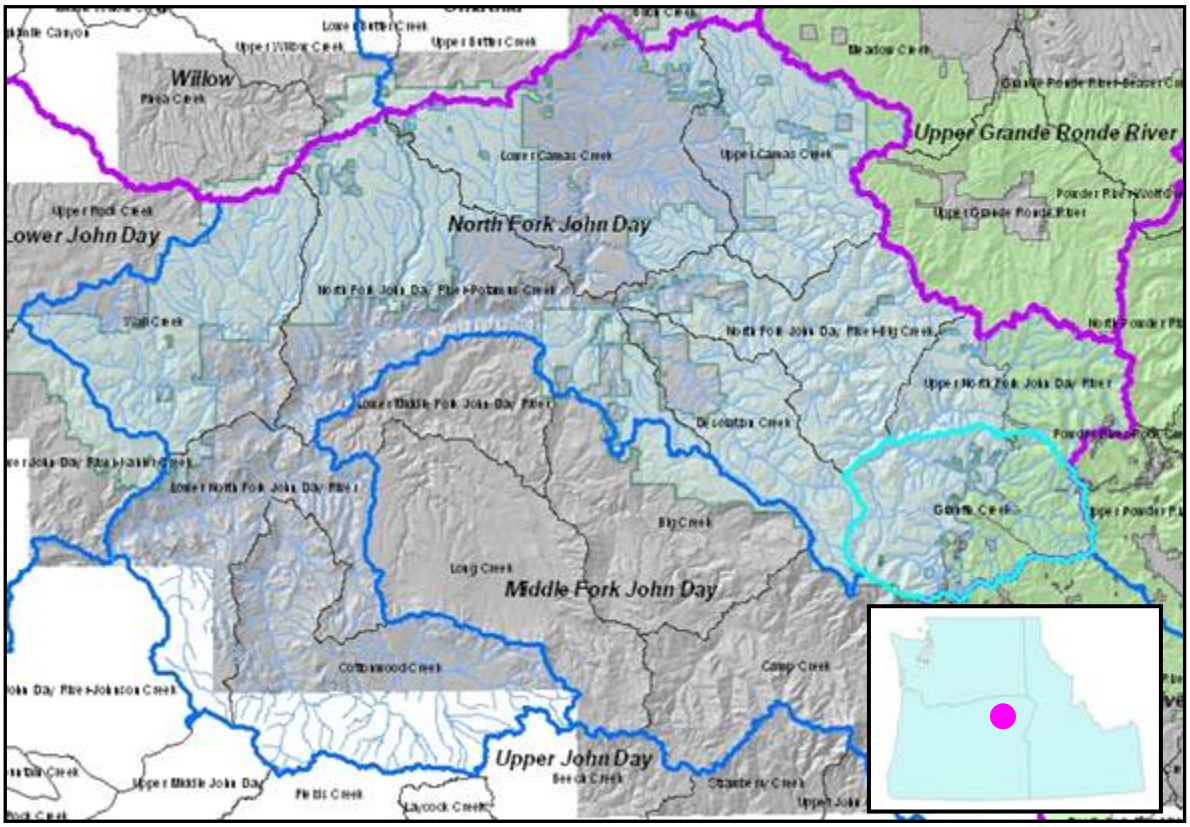

Figure 1. North Fork John Day subbasin and Granite watershed, (inset of 3 NW states with approximate location of the Granite area.

The Granite Creek watershed arises at elevations over 8000 feet in the Elkhorn and Greenhorn Mountains. Main Granite Creek and its tributaries flow in a northwesterly direction to join the NFJD River at an elevation of 3900 feet. Average annual precipitation ranges from 55 inches in the higher elevations to 25 inches at the lowest elevations (confluence of the NFJD), with the majority of precipitation accumulating as snow from November to April. Granite is in the cold snow zone, with mean January temperatures of about 20ºF. The runoff-streamflow regime is dominated by spring snowmelt with peaks occurring in May and June. The geology includes ancient seafloor volcanics and crustal ultramafics, a mix of sedimentary and metamorphic complexes, granite intrusions, a more recent series of surface volcanic flows (Columbia River

Basalts), glacial moraines, and recent alluvial deposits. Minerals of interest are not limited to any one geologic formation or rock type, but can be found in all of them. Vegetation communities in the watershed reflect the influences of climate, topography, and geologic setting, and are characterized by mixed dry pine plant communities in the lower elevations and cool-moist subalpine fir/whitebark pine in the higher elevations. Fuel conditions vary widely across the watershed but trend toward the high end of loadings partly as a result of fire suppression. Riparian vegetation types include conifer communities in smaller tributaries, grass-forb meadow types, and mixed forb-shrub communities, including black cottonwood, aspen, willow, red-osier dogwood, rocky mountain maple, wetland forbs, sedges, and a variety of grass species. The general condition of vegetation varies across the landscape depending in part on past management of the specific area. Invasive plants are present but are localized at this time. Active treatment is occurring at known sites but there is potential for spread. The only known invasive aquatic organism, brook trout, are present in Granite Creek and adjacent watersheds.

The Granite Creek watershed contains federally listed Middle Columbia River steelhead (*Oncorhynchus mykiss*) and Columbia River bull trout (*Salvelinus confluentus*). Other native fish species in the watershed include spring Chinook salmon (*O. tshawytscha*), inland redband trout (*O. mykiss gairdneri*), westslope cutthroat trout (*O. clarkii lewisi*), and margined sculpin (*Cottus marginatus*) brook trout (*Salvelinus fontinalis*), a non-native fish species, are know to occur in the NFJD River and Granite Creek. Approximately 87 miles of streams in the Granite Watershed have also been federally listed as designated critical habitat for Mid-Columbia Steelhead and Essential Fish Habitat for spring Chinook salmon.

Granite, Beaver, Bull Run, and Clear Creeks are listed under the Clean Water Act section 303(d) for temperature, and Granite and Bull Run Creeks are listed for sedimentation. The FS is participating with Oregon DEQ in development of TMDLs (Total Maximum Daily Load, or targets for water quality improvement) for the John Day River Basin. This watershed action plan will contribute to meeting water quality requirements in the TMDL, though specific targets and/or loads have yet to be determined.

The primary human impacts to the watershed include historic and active mining (lode and placer), water diversions, timber harvest, road construction, historic domestic livestock grazing, ongoing motorized recreation, and human habitation. Hazardous fuels and Wildland Urban Interface (WUI) designation in the vicinity of Granite (extreme hazard rating) make this area a priority for fuels reduction. There is no livestock grazing currently permitted on the National Forest (the Camp Creek allotment was vacated in 2006). Effects from natural disturbances including wildfires and insect and disease epidemics are also present in the watershed.

The Granite Creek watershed lies within ceded lands of the Confederated Tribes of the Umatilla and Warm Springs Indian Reservations. By treaty, Tribes have retained rights to hunting, fishing, and gathering on these lands.

The WAW completed a watershed analysis for Granite Creek in 1997. The Northwest Power Planning Council finished a "Subbasin Plan" for the John Day River basin in 2005 (http://www.nwcouncil.org/fw/subbasinplanning/johnday/plan/). Numerous biological assessments for listed fish species have been conducted which describe limiting factors and specific actions to protect or restore listed fish. An OWEB collaborative prioritization with state and federal agencies (2002) identified Granite as a high priority for restoration in the John Day River. The Mid-Columbia Recovery Plan (NOAA Fisheries) for steelhead is nearing completion and has been posted in the Federal Register (final out for comment, October 2008). This recovery plan incorporates Granite Creek and its tributaries. The Umatilla National Forest participated in the planning process for recovery planning and was involved with the development and review of the plan.

II. Process for Prioritizing Watersheds

The Wallowa-Whitman National Forest used the Aquatic Module Approach (Heller *et al.* 2002) to establish forest watershed priorities at the HUC5 level (watershed). This approach considers resource condition, watershed sensitivity, and management related risk factors in establishing priorities. Establishing the priorities for the Whitman Ranger District, in context of the forest, was completed by an interdisciplinary team of fish biologists, watershed specialists, and range managers. Throughout the process, involvement was solicited from partners including North Fork John Day Watershed Council, Baker County, Powder River Watershed Council, Oregon Department of Fish and Wildlife, Confederated Tribes of the Umatilla Indian Reservation, and the John Day Basin Working Group.

The Umatilla National Forest followed a similar process and developed an interdisciplinary watershed restoration prioritization (2002) to establish forest-wide watershed priorities at the HUC5 level. Granite Watershed was among the overall "High" priority watersheds for the forest, with "High" priority individual ratings for watershed, fish/aquatics, and vegetation condition.

In 2005, the UMA and WAW began working cooperatively to identify mutual watersheds of interest, tiering to the regional Aquatics Restoration Strategy (2005) and basin prioritization, and using the John Day Basin Working Group to formalize the selection of Granite Creek for development of a Watershed Action Plan (WAP). The Granite WAP distills the various plans and assessments to identify critical outstanding restoration needs, factors limiting recovery, and estimate costs, timelines, and logical sequencing of priority restoration projects for the next 5 to 10 years. The WAP summarizes current conditions, and identifies linkages to existing programs and partnerships (roles and responsibilities).

This cooperative effort between the UMA and WAW is intended to focus scarce resources towards restoration of essential watershed and aquatic elements. The UMA and WAW will continue to work with the various partners in the Granite Creek

watershed to gain support and assistance in implementing the Watershed Action Plan. Partners include: Oregon Department of Fish and Wildlife (ODFW), Oregon Department of Environmental Quality ODEQ), Grant County, Grant Soil and Water Conservation District (Grant SWCD), Confederated Tribes of the Umatilla Indian Reservation (CTUIR), Confederated Tribes of the Warm Springs Indian Reservation (CTWS), North Fork John Day Watershed Council (NFJDWC), US Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), and private landowners and operators.

III. Whole Watershed Restoration

A review of the watershed analysis, subbasin plan, aquatic passage assessments, Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process, and various project specific planning documents identified **areas in the Granite Creek watershed that need active restoration** and the factors limiting physical or ecological function. Site-specific actions leading to improvement are provided in the Action Plan section and identified at the HUC6 (subwatershed) scale. This scale allows aggregation of actions and priority needs to the HUC5 watershed scale for comparison across basins.

Restoration Needs and Goals

General restoration needs and goals for the Granite watershed include: addressing known water quality impairments, identifying and prioritizing abandoned mine sites that pose a significant hazardous risk to the environment[1], removing physical and chemical barriers in waterways, and improving stream function, floodplain connectivity, and riparian conditions.

1) Stabilize critical known impairments to water quality and aquatic resources. Identify and prioritize abandoned lode mine actions: there are hundreds of abandoned lode mine sites in the watershed, their status and condition are largely unknown (Appendix A). Abandoned lode mines with acid mine discharge currently under CERCLA clean-up actions include the Black Jack and Blue Bird mines (on Clear Creek).

2) Identify and prioritize abandoned placer mine reclamation actions: there are hundreds of abandoned placer mine sites impairing stream flow in the watershed. Successful floodplain restoration has been completed along Clear and Granite Creeks using these placer tailings.

[1] ***Placer*** mines are separate from ***lode*** mines: placer tailings are rarely toxic to the environment; we have successfully removed placer tailings in Granite and Clear Creeks without CERCLA endorsement. Lode mine dumps and tailings are significantly different from each other, and from placer tailings, and are almost always toxic to the environment. Lode dumps and tailing should not be moved in stream restoration. CERCLA actions are limited to lode mines (pers. com., G. Visconty, 9-15-2008).

3) Remove physical barriers to aquatic passage: inventories of fish passage at road-stream crossings have identified numerous "Red" culverts, prioritize and remove these barriers. Roads in valley bottoms in critical locations also pose physical barriers to aquatic organisms, for example, the county road along Clear Creek (FSR 13).

4) Reconnect floodplains and tributary habitat and restore native riparian vegetation: placer mining and roads have separated floodplains and channels, critical reaches have limited floodplain connectivity and native riparian vegetation (extirpated and non-reproducing species).

Watershed Elements and Limiting Factors

The following list, organized by "watershed elements", identifies conditions, limiting factors and potential actions to address them. The list was derived from source materials (watershed analysis and assessments) and from local subject mater experts. It is intended to help identify and focus on critical elements and factors to be addressed by this Action Plan.

1. Upland Watershed Conditions (UWC):

- Lode mine sites
- Roads contributing to increased drainage network
- Unstable slopes (slumps, slides, and gullies)
- Water diversions and ditches
- Uncharacteristic vegetation and fuels

Factors limiting the improvement of upland watershed conditions

- Mining impacts (range of effects from soil disturbance to acid mine discharge)
- Road density, location, and diversion potential
- Overstocking and/or uncharacteristic fuel loading
- Uncharacteristic species composition

Actions resulting in improvement:

- Reclamation of disturbed mine sites
- Road decommissioning
- Precommercial thinning, fuels treatment
- Revegetation of reclaimed and decommissioned sites.

2a. Riparian Areas (RA):

- Placer mine sites
- Stream-valley floor hydrologic connection
- Wetland type and setting
- Active floodplain
- Valley floor (abandoned floodplain)
- Riparian vegetation (composition, abundance, diversity, and distribution)
- Canopy and large wood recruitment

2b. Stream Channels:

- Placer mine sites
- Channel form (width-depth)
- Channel sinuosity
- Stream bank stability
- Stream-valley floor hydrologic connection
- Channel bed armoring
- Pool-riffle ratios and distributions
- Large wood frequency
- Bank undercuts
- Shade/cover
- Stream bank vegetation composition, distribution, and abundance

Factors limiting restoration of riparian areas and stream channel form and function

- Magnitude of historic channel widening, incision, and straightening
- Lack of sediment trapping mechanisms in the channel
- Lack of sediment storage on floodplains
- Active mining
- Placer tailings lining stream banks and confining the stream channel

Actions resulting in improvement:

- Plant appropriate riparian vegetation
- Protect existing riparian vegetation (fencing or barriers to motorized access)
- Remove/reconfigure placer tailings that confine streams and prevent floodplain access
- Improve habitat for beavers
- Increase channel sinuosity by improving floodplain connectivity

3. Aquatic/Fish Habitat (AH):

- aquatic passage
- pool and riffle habitat
- stream bank stability
- large wood components
- water temperatures
- water chemistry

Factors limiting the improvement of aquatic/fish habitat

- Degraded physical habitat, loss of habitat connectivity, loss of aquatic habitat complexity (large wood, stable pools, riffles, runs, bank undercuts,

spawning substrate, side channels), elevated stream temperatures, chemical barriers.

- Passage barriers at road-stream crossings, valley bottom roads, ditches, culverts, reaches that go seasonally dry

Actions resulting in improvement

- Fix culverts so passable during all life stages
- Increase water quantity, volume and timing (See Water Quantity)
- Restore instream flows where lost to hyporheic zone
- Increase stream side shade
- Improve stream-valley floor hydrologic connection and baseflows
- Decrease channel widths
- Increase channel sinuosity
- Placement of woody material
- Vent or remove roads that bisect streams to reconnect flow
- Treat/remove lode mine chemical sources

4. Water Quantity

- Volume and timing of flows – placer mine and road impacts; increased stream velocity, decreased overbank flows (floodplain storage function), floodplain storage losses, reduced late season flows. Diversions and ditches have altered flows and affected stream function.

Factors limiting the improvement of water quantity

- lack of water retention capability in the watershed
- altered groundwater tables
- loss of stream-valley floor hydrologic connection
- infrequent valley floor flooding limiting groundwater recharge
- stream diversions and ditches
- mining impacts on groundwater (aquifer storage, hyporheic exchange)

Actions resulting in improvement

- Improve stream-valley floor hydrologic connection, sediment storage
- Restore suitable beaver habitat
- Improve wet meadow function
- Evaluate water rights and uses, seek opportunities to conserve use and transfer consumptive water rights to instream flows

5. Water Quality (WQ):

- Water chemistry
- Summer water temperature
- Sediment loads (sources include: mines, roads, landslides, headcuts, upland erosion, and streambank erosion

Factors limiting the improvement of water quality

- Acid mine discharge[2]
- Over wide and incised stream channels
- Lack of stream side shade
- Water withdrawals for irrigation
- Loss of stream-valley floor hydrologic connections
- Decreased base flows
- Fine sediment accumulations in tributary spawning reaches
- Localized high sediment inputs

Actions resulting in improvement

- Operate and maintain pipe systems in abandoned mine sites under CERCLA (Black Jack, Blue Bird) and work with private owners of the Red Boy pipe system
- Maintain ponds and wetlands to effectively treat acid mine discharge
- Identify and prioritize critical CERCLA removal actions
- Stablize headcuts
- Decommission or upgrade unstable roads
- Increase stream side shade by planting shrubs and conifers
- Restore wet meadow function
- Reduce active channel width
- Increase active floodplain area
- Large wood placement on floodplain

IV. Action Plan Development

Restoration and reclamation work has been ongoing in the Granite Creek watershed for more than two decades, yet much remains to be done. Some actions may be one-time investments, but others will require long term investment because chronic conditions and/or severe impacts. Portions of the watershed were severely altered by lode and placer mining activities from the late 1900s up to WWII. Mining effects on watershed function are variable, highly complex, and fully described elsewhere in numerous reports and scholarly articles. In the 1970s and 1980s, restoration activities focused on improving instream habitat to increase pools and help ensure survival during the late summer low flow period. Numerous instream structures (log-rock weirs) were installed in tributaries to improve late summer pool habitat and hold fish. During the same time period, efforts to reclaim abandoned mines with known toxic discharge focused on diverting discharge into off-channel settling ponds. Recently, several CERCLA actions have been implemented to address priority sites (http://www.fs.fed.us/r6/uma/projects/index.shtml). Between 2001 and 2007, 2 miles of Granite Creek and 3 miles of Clear Creek had dredge tailing restoration, including

[2] Recent spawning ground surveys in the John Day Basin identified "a significantly higher incidence of gill lesion…in the Granite Creek System when compared to the rest of the basin". (July 2007, draft report, Terra Lang Schultz, Oregon Dept. of Fish & Wildlife, Fish Research Asst. Project Leader). Gill lesions may be related to exposure to heavy metals (K. Groves, pers. com. April, 2008).

planting of 5000 shrubs, hardwoods, and conifers, and approximately 400 lbs of native seed mix. Over 6 miles of road were decommissioned (full obliteration) with Legacy road funds in 2008 in Lower Granite Creek, and several passage projects are in the planning stages (upper Granite Creek).

The Granite Creek Watershed Analysis completed in 1997 contained a number of recommended actions. These related to pool development, large wood additions, planting in riparian areas, and mine reclamation. Road decommissioning in Riparian Habitat Conservation Areas (RHCAs) and along fishbearing streams was also discussed, but specific road locations were not identified.

Mining-related actions

Inventory and assessment of abandoned mines is ongoing on National Forest lands, coordinated through the Regional Office. This inventory is part of the National Abandoned Mine Lands (AML) program to assess the status and condition of abandoned mines and to plan for reclamation actions (Appendix A). For example, removal actions under CERCLA were recently completed at the Black Jack and Blue Bird mine sites on Clear Creek, with new pipe drainage systems installed under a Regional contract. Operation and maintenance of pipe systems was the responsibility of the Forest, however, there are new operational and funding challenges because of added complexity and limited access with the new pipe systems. There are hundreds of other abandoned mines in the watershed and their status is largely unknown. A "watershed study" was proposed to source contaminants and prioritize additional removal actions (RO Nov 6 USDA hazardous materials proposal)[3].

Active mining -- two Environmental Impact Statements, Upper Granite Mining EIS (WAW) and North Fork John Day Mining EIS (UMA), are also in progress to address active mining operations in the Granite Creek watershed. For the Wallowa-Whitman's EIS, there are 44 proposals, with 28 lode mines, but not all of these are active. In the Umatilla's EIS there are 16 active mine proposals in the Granite watershed (Figure 2).

Aquatic Organism Passage

The UMA and WAW completed culvert inventories for aquatic passage in 2003. This assessment identified culverts that were barriers to aquatic passage, primarily fish. The resulting culverts have been incorporated into the annual program of work for the Forests. Two culverts on Granite Creek (Granite #1 and Granite #2) were replaced in 2006. A culvert on Lightning Creek (tributary to Clear Creek) was replaced with a low cost bridge, completed in 2006.

[3] This involves a funding decision by USDA. The RO requested a funding several years ago but unlikely to receive a response in the immediate timeframe due to national priorities. The intent is to evaluate the entire watershed with a site investigation under CERCLA to identify suspect elements and source tributaries, trace elements to their source, as an alternative to site investigations mine-by-mine (Greg Visconty, pers. com., 9-15-2008)

In 2006, the WAW conducted an aquatic passage assessment on Forest Highway segments within the greater forest boundary. These segments are primarily on county and state roadways leading into the national forest.

These aquatic passage assessments provided the UMA and WAW with an inventory of aquatic passage problems in the Granite Creek Watershed. Table 1 displays known aquatic passage problems at road-stream crossings.

Table 1. Passage barriers identified from culvert inventories in Granite watershed

Site/Stream Name	Township	Range	Section	¼ Section	Status	Priority
Umatilla National Forest						
Ten Cent Creek	08 S	35 E	35	NE of NE	Red	M
West Ten Cent Creek	08 S	35 E	26	SE of NE	Red	M
West Ten Cent Creek	08 S	35 E	36	NW of NW	Red	M
Lightning Creek	09 S	35 E	28	SW of NE	Completed 2006	H√
Lake Creek	09 S	34 E	11	SW of SE	Red	L
Lake Creek	09 S	34 E	15	SE of NE	Red	L
Rabbit Creek Tributary	09 S	34 E	13	SW of SE	Red	
Lost Creek	09 S	34 E	14	SE of NE	Red	M
Granite Creek	08 S	35.5E	31/32		Red	H
Beaver Creek	09 S	35 E	14	SE of SE	Red	H
Wallowa-Whitman National Forest						
Granite Creek	08S	35.5E	34	SW of SW	Red	
Granite Creek	08S	35.5E	24	NE of SW	Red	
Granite Creek	08S	35.5E	23	SW of NW	Red	
Bull Run Creek	09S	35.5E	10	SE of NW	Red	
Corral Creek	09S	35.5E	2	NE of SE	Red	
Lamb Creek	09S	35.5E	10	NW of NW	Red	
Bull Run Creek	09S	36E	18	NE of SW	Red	
Bull Run Creek	09S	36E	19	NW of NE	Red	
Channel Creek	09S	36E	16	SW of NW	Red	
Deep Creek	09S	36E	18	NW of NE	Red	
Deep Creek	09S	36E	18	NE of SW	Red	
Gold Center	09S	36E	21	SE of NE	Red	

Note: Granite Creek (UMA) has partial funding from CTUIR through 2009 for implementation

Road assessments for both forests have been completed to varying degrees but have not been assessed for this WAP. There are many opportunities for road decommissioning, obliteration, stabilization and storm-proofing to address loss of floodplain connectivity, increased drainage networks, loss of riparian vegetation, increased sediment delivery to stream channels, and increased stream crossings. Over 20 miles of road were identified for possible decommissioning in the Granite Mining EIS, and project roads analysis, (information available in the project file). A CE was completed in 2008, roads were field verified, and 6 miles of high risk roads were decommissioned.

Numerous other actions were identified and listed below, and some are in progress. Actions are identified by subwatershed, with limiting factors, priority, and sequencing (recognizing that some actions are linked) (Table 2). This compilation and prioritization will allow the Wallowa-Whitman and the Umatilla National Forests to strategically target and coordinate the next series of restoration actions in the Granite Creek watershed.

Funding and Partnership Opportunities

A variety of funding sources will be needed to plan and implement critical restoration actions. Mining-related actions are generally funded through Regional and National programs and priorities. Coordination and support from Regional engineering and minerals programs will be essential to accomplishing critical mine-related actions, including operation and maintenance of remediation systems. Fund sources for other actions include regular appropriated, Regional restoration (WWRI), Bonneville Power Administration, and federal Capitol Improvement Program (CIP). Partners include the CTUIR who have a vested interest in the watershed and are already working with the Forests on AOP projects. The NFJD Watershed Council, ODFW, Grant County, Grant SWCD, Oregon Department of Transportation, and Trout Unlimited are also likely or potential partners.

County road 24 (FSR 13) in Clear Creek floodplain

Table 2. Possible restoration actions in the Granite Creek watershed to address limiting factors

6th field HUC Name	Lead Unit	Project ID	Project	Location	Limiting Factor(s) Addressed	Linked Projects	Priority	Area needing Active Restoration**
Upper Granite Creek	WAW	UG-1	Granite Slide Stabilization	73 Road – MP 32.8	Slope stability/sediment delivery		Med	WC
		UG-2	Culvert Replacement	73 Road – MP 33.4	Access - steelhead		Med	AH
		UG-3	Culvert Replacement	FHS – 225 MP 0.10	Access - steelhead		Med	AH
		UG-4	Riparian Plantings	Boulder Cr; SF Boulder upstream for ~ 1 mile	Water quality	N; Can be implemented at any time	Low	WQ, AH, RA
Bull Run Creek		BR-1	Culvert Replacement	FHS – 113 MP 5.8	Access - steelhead		High	AH
		BR-2	Culvert Replacement	FHS – 113 MP 11.7	Access - steelhead		High	AH
	WAW	BR-3	Bull Run Creek/73 Road Venting	73 Road b/w Corral Cr and Onion Gulch	Temperature; flow	N	High	AH, WQ
Beaver Creek		BC-1	Culvert Replacement	13 Road (also referenced as County Road 24)	Access		High[1]	AH
	WAW	BC-2	Clear Cr Reconnect	Ab. Clear Cr confluence with Beaver Creek	Access	Y	High with sequencing [1]	AH

6th field HUC Name	Lead Unit	Project ID	Project	Location	Limiting Factor(s) Addressed	Linked Projects	Priority	Area needing Active Restoration**
	WAW	BC-3	Headcut Stabilization	Above Beaver Meadows	Sediment delivery; low groundwater table	Y; linked to BC-2 and CC-6	Low	AH, WQ
Clear Creek		CC-1	CERCLA Actions	various	Water quality (chemical, physical), barriers		High	WC, WQ, AH, RA
		CC-2	Abandoned Mines	various	Water quality (chemical, physical), barriers	?	?	Unknown
		CC-3	Redboy Mine			Bluebird, Black Jack maintenance	High[2]	WQ
		CC-4	Road Decomm.		Sediment			WC
		CC-5	Pete Mann Ditch	Upper Olive, Lightning, Clear Creek	Flow, temperature	NA	Low	WC, RA
		CC-6	1300 Road/Clear Creek	13 Road (also referenced as County Road 24)	Wetland/floodplain functions, shade	BC-2	High[1]	AH, RA
		CC-7	Floodplain Dam Structure Removal	Upper Clear and Olive Cr	Floodplain function		Med	RA, WQ, AH
		CC-8	Riparian Revegetation	RM 0-6	Wetland/floodplain functions, shade	In progress	High	RA, AH
		CC-9	Large Wood Placement on Floodplain	RM 3-4	Wetland/floodplain functions, habitat complexity	In progress	Med to High	RA, AH

6th field HUC Name	Lead Unit	Project ID	Project	Location	Limiting Factor(s) Addressed	Linked Projects	Priority	Area needing Active Restoration**
		CC-10	Noxious weeds	Clear Creek/ Lightning Creek			Med	
		CC-11	Instream Large Wood Placement	Clear Creek	Floodplain function, habitat		Low	RA, AH
Lake Creek		LC-1	Road Decomm.				Low	UC
		LC-2	Olive Lake Dam	Olive Lake/Lake Creek			Med	AH, RA
		LC-3	Fish Passage	Lake Creek/10 Rd	Access		Low	AH, RA
		LC-4	Fish Passage	Lost Cr/10 Rd	Access		Med	AH
		LC-5	Fish Passage	Lake Cr	Access		Low	
		LC-6	Fish Passage	Rabbit Cr / 10 Rd	Access		Low	
		LC-7	Abandoned Mines				Variable	WC, RA, AH
		LC-8	Riparian Revegetation		Wetland/floodplain functions, habitat complexity		Med	RA, AH
Lower Granite Creek	Uma	LG-1	Trail Stabilization and Erosion Control	Granite Creek Trail	Sediment		Low	WC
	Uma	LG-2	Road Decomm.				High	Completed 6 miles in 2008
	Uma	LG-3	Road improvement, storm proof	Granite Cr/1035	Sediment		High	WC, WQ
	Uma			Granite	Access			Planning in

6th field HUC Name	Lead Unit	Project ID	Project	Location	Limiting Factor(s) Addressed	Linked Projects	Priority	Area needing Active Restoration**
		LG-4	Fish Passage	Cr/1035 Rd			High	progress
	Uma	LG-5	Fish Passage	Ten Cent/1035	Access		Med*	AH
	Uma	LG-6	Fish Passage	W Ten Cent/1035	Access		Med*	AH
	Uma	LG-7	Fish Passage	W Ten Cent/7350	Access		Med*	AH
	Uma	LG-8	Large Wood Placement	Granite Creek	Wetland/floodplain functions, habitat complexity		Med	RA, AH
	Uma	LG-9	Riparian Revegetation	Granite Creek	Wetland/floodplain functions, habitat complexity		High	RA, AH
	Uma	LG-10	Abandoned Mines	various			Variable	unknown
	Uma	LG-11	CERCLA – Magnolia Mine/Ajax	Appendix A	Water quality (chemical, physical), barriers		High	WC, RA, AH
	Uma	LG-12	Dredge Tailings Restoration	Rabbit and Granite Creek	Wetland/floodplain functions, habitat complexity		Low to Med	RA, AH, WQ

* Replace Ten Cent Creek culvert first, then the two culverts on W. Ten Cent Creek

** Areas needing active restoration key: WC = Watershed Condition; AH = Aquatic/Fish Habitat; WQ = Water Quality; RA = Riparian Areas

[1] 1300 road needs to be moved first before Beaver Creek is reconnected.

[2] Requires state coordination.

V. Action Plan

The Granite Creek Watershed Action Plan identifies critical high priority actions based on known limiting factors, sequenced by planning and implementation dates for a 10 year period (Table 3). The actions are displayed with estimated costs, anticipated BLI and linked to partnership opportunities. It will be important to identify and coordinate opportunities with partners to fully implement priority actions in the watershed. Funding from partners will be a key component to full implementation.

Table 3. Granite Creek WAP focused restoration needs.

Location	Project Actions	Priority	Approx. Cost and Associated BLI	Planning (yr)	Implementation (yr)	Partner Opportunity
Clear Creek	Ongoing CERCLA Actions - finalize O&M plans for Black Jack and Blue Bird mines, coordinate Red Boy mtce. (private)	H	10,000/yr	In progress	ongoing	Need Regional support (earmark?)
Upper Granite	Ajax-Magnolia, Monumental, New York planned removal (CERCLA) actions	H	TBD	In progress	TBD	Mine operators, ODEQ
Watershed or tributary	Watershed or other strategic approach to prioritizing AML work	H	~500,000 (USDA)	Proposed to USDA	Needs work to be a viable proposal	USDA, ODEQ, RO, Mine operators
Upper Granite, Clear Creek	AOP priority projects	H-M	150,000 per site (CMRD, CMLG, HTAP)	2008-2010	2009-2012	CTUIR, NFJDWC
Clear Creek	Valley bottom road in Clear Creek	H	120,000 (CMLG, HTAP)	2009-2010	2011	Grant County, NFJDWC
Beaver Creek	Stream reconnection	H	75,000 (NFWF)	2010	2011	ODFW, CTUIR, NFJDWC
Clear and Granite Creeks	Riparian planting and large wood placement (select reaches)	M-H	50,000 (NFWF, NFVW, OWEB, WWRI)	2009-2010	2010-2015	CTUIR, ODFW, NFJDWC, OWEB Stewardship?
Upper Granite, Bull Run, Clear, Beaver, Lake	Complete roads analysis, prioritize high risk to aquatics, complete critical storm proofing and decommissioning	M-H	30,000 - 200,000 (CMRD, CMLG)	2008-2010	2009 (lower Granite) Other 2010-2012	CTUIR, County, NFJDWC

VI. Line Officer Endorsement

I have reviewed the Granite Creek Watershed Action Plan and concur with its findings and prioritization of actions. I will work with the Natural Resources Staff on my respective forest to integrate this high priority Watershed Action Plan with the other high priority Watershed Action Plans on the forest and the forest's program of work.

/s/ Ken Anderson 9/29/2008
Ken Anderson, District Ranger — Date
Whitman Ranger District
Wallowa-Whitman National Forest

/s/ Kristy Groves for Craig Smith-Dixon 9/22/2008
Craig Dixon, District Ranger — Date
North Fork John Day Ranger District
Umatilla National Forest

Beaver Creek Meadow Late season dry channel barrier downstream at mouth prevents access to meadow habitat

Appendix A

Mine Status (2007) – Granite Creek Watershed

Note: Shaded mines indicate most prominent sites in the watershed needing action

MINE NAME	FOREST	PLAN NAME	APA	RESULTS /RISK	SI	EE/CA	REMOVAL ACTION	Comments
Upper Granite Creek								
Monumental	W-W	NOI	02/2003	Do an SI	01/2004	2007	2008	Programmed
Cap Martin Complex	W-W	-----	08/2006	Do an SI	01/2004	2007		
Granite Creek Mine 7	W-W	-----	08/2006	Do an SI	-----	2007		No SI done, to be in EE/CA
Granite Creek Mine 6	W-W	-----	08/2006	NFA	-----	N/A	N/A	May be included in EE/CA
Sheridan	W-W	-----	-----	-----	01/2004	2007		No APA done
Tillicum	W-W	Tillicum	02/2003	Do an SI	01/2004	2007		Dump issues
Horace Worchester	W-W	-----	08/2006	N/A	N/A	N/A	N/A	On private land
Granite Creek Mine 5	W-W	-----	08/2006	Do an SI	-----	2007		No SI done, to be in EE/CA
Golden Fraction	W-W		08/2006	Do an SI	-----	2007		No SI done, Cree claim
Central Complex	W-W	Shipman	08/2006	NFA	01/2004	2007		East side of FSR 73
Chipman Gulch – trib to Granite Crk								
Buffalo	W-W	Buffalo	08/2006	NFA				No action required under current operation. FS/pvt lands
Boston Tunnel	W-W							Pvt lands
East Eddie Group	Umatilla	Shipman	08/2006	Do an SI	2007	2008	2010 ?	West side of FSR 73
Lucas Gulch – trib to Granite Crk								
Magnolia	Umatilla	Magnolia	12/2002	Do an SI	01/2004	03/2005	2008?	To be programmed
Ajax	Umatilla	-----	12/2002	Do an SI	01/2004	03/2005	2008?	To be programmed
Granite Creek Mine 4	Umatilla	-----	08/2006	Medium			2008?	May include in Magnolia RA
China Gulch – trib to Granite Crk								
Independence	Umatilla	Independence	12/2002	NFA				
SW St. Paul	Umatilla	SW St. Paul	8/2006	NFA				Lower portal drainage to consider in proposed Plan of Operations

MINE NAME	FOREST	PLAN NAME	APA	RESULTS /RISK	SI	EE/CA	REMOVAL ACTION	Comments
Granite Creek								
Granite Creek Mill	Umatilla	-----	08/2006	Do an SI	2007	2008	2010	Likely operated for the Cougar & Independence mines, cultural
New York	W-W	New York/Paiger	08/2006	Do an SI	2007	2008	2010	Tailings in creek, mine discharge
Granite Creek Mine 3	W-W	-----	08/2006	NFA				
Granite Creek Mine 2	Umatilla	-----	08/2006	NFA				
Granite Creek Mine 1	W-W	-----	08/2006	NFA				
Last Chance Crk – trib to Granite Creek								
Lost Buck	W-W		2007					
Sunset Lode	W-W		2007					
Tetra Alpha Lode	W-W		2007					
Prospect	W-W		2007					
Beagle Creek Lode	W-W		2007					
Corral Creek – trib to Bull Run Crk, which is a trib to Granite Crk								
Uncle Sam	W-W		2007					
Boundary Crk – trib to Bull Run Crk								
Gold Bug Grizzly	W-W							
Deep Creek – trib to Bull Run Crk								
Ibex	W-W							Pvt lands; there are 4 other mines in this drainage

MINE NAME	FOREST	PLAN NAME	APA	RESULTS /RISK	SI	EE/CA	REMOVAL ACTION	Comments
Clear Creek – trib to Granite Crk								
Red Mountain Mine	?							3 mines on FS(?) from confluence with Granite Creek to Red Mountain, numerous private mines and a couple that appear on FS
Bluebird	Umatilla	-----	10/2002	Do an SI	02/2004	02/2005	2008	This will be an ongoing project.
Black Jack	Umatilla	-----	2003	Do an SI	02/2004	02/2005	2008	This will be an ongoing project.
Congo Gulch – trib to Clear Crk								
Red Boy	Umatilla							Pvt lands
7 mines in area	Umatilla							Between Freemont Powerhouse and Red Boy, 7 mines that appear on FS
Mosquito Gulch – trib to Congo Gulch								
Gray Eagle	P							
Blue Mountain	Umatilla							
Greenhorn Area								Numerous mines and tribs, so will not try and breakout which trib these mines are located on.
Altona	W-W		2007					
Aurora	W-W		2007					
Beaver Lode	W-W		2007					
Belcher	W-W		2007					
Big Elk	W-W		2007					
Don Juan	W-W		2007					
Eureka	W-W		2007					
Eureka 2	W-W		2007					

MINE NAME	FOREST	PLAN NAME	APA	RESULTS /RISK	SI	EE/CA	REMOVAL ACTION	Comments

Greenhorn Mine 1	W-W		2007					Given name of Greenhorn Mine as unnamed
Greenhorn Mine 2	W-W		2007					
Greenhorn Mine 3	W-W		2007					
Greenhorn Mine 4	W-W		2007					
Greenhorn Mine 5	W-W		2007					
Greenhorn Mine 6	W-W		2007					
Greenhorn Mine 7	W-W		2007					
Greenhorn Mine 8	W-W		2007					
Greenhorn Mine 9	W-W		2007					
Humboldt	W-W		2007					
Humpback	W-W		2007					
Lightning Creek	Umatilla		2007					Adit and placer
Lucky Strike	W-W		2007					
Ophir	W-W		2007					
Owl	W-W		2007					
Pyx	W-W		03/2004	Do and SI				
Quartz Gulch Lode	W-W		2007					
Quebec Area	W-W		2007					
Rabbit	W-W		03/2004	Do and SI				
Redbird	W-W		2007					
Robinsonville	W-W		2007					
Royal White	W-W		2007					
Van Anda	W-W		2007					
Yellow Jacket	W-W		2007					

MINE NAME	FOREST	PLAN NAME	APA	RESULTS /RISK	SI	EE/CA	REMOVAL ACTION	Comments
East Ten Cent Creek, tributary to Ten Cent Crk, trib to Granite Creek								
Brice 1-3	Umatilla		2007					
PBGF 1-3	Umatilla		2007					
Cougar Mine	Umatilla							Pvt lands
3 mines	Umatilla							3 mines appear on FS

Notes:

1. This list is by no means to be considered a comprehensive list of mines in the Granite Creek Watershed. These are merely mines I'll be working on and private mines within the same vicinity. Private mines were not listed for the Greenhorn area.
2. Any quad map of the area can be pulled up and dozens upon dozens of mines will be shown, unnamed, named, or private. The list is but a small fraction of what is on the ground.
3. Acronyms:
    a. APA – Abbreviated Preliminary Assessment
    b. SI – Site Inspection
    c. EE/CA – Engineering Evaluation/Cost Analysis
    d. RA – Removal Action
    e. CERCLA – Comprehensive Environmental Response, Compensation and Liability Act
    f. NFA – No Further Action