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Watershed Sediment Reduction Plan and Master Reassessment and Treatment Schedule

South Fork Elk River CAO

NCRWQCB R1-2004-0028

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Table of Contents {A2}

TABLE OF CONTENTS {A2}	2
LIST OF TABLES	2
LIST OF TABLES	2
BACKGROUND	4
OVERVIEW	4
SEDIMENT SOURCE TREATMENT PROGRESS TO DATE	4
SEDIMENT SOURCE INVENTORY PLAN	6
ROADS	6
LANDSLIDES	6
SKID TRAILS	6
<i>Skid Trail Inventory Scheduling</i>	6
MASTER ASSESSMENT AND TREATMENT SCHEDULE	7
REASSESSMENT AND TREATMENT OF SEDIMENT SOURCES	7
ROADS	7
SKID TRAILS	8
LANDSLIDES	8
APPENDICES	11
APPENDIX A. MAP OF SITE TREATMENT STATUS IN SOUTH FORK ELK RIVER	12
APPENDIX B. MAP OF SKID TRAIL INVENTORIES IN SOUTH FORK ELK RIVER	13
APPENDIX C. REASSESSMENT AND TREATMENT SCHEDULE FOR PENDING ROAD RELATED SEDIMENT SOURCES IN THE SOUTH FORK ELK RIVER WATERSHED.	14
APPENDIX D. REASSESSMENT AND TREATMENT SCHEDULE FOR PENDING OFF ROAD SEDIMENT SOURCES IN THE SOUTH FORK ELK RIVER WATERSHED.	15
APPENDIX E. ASSESSMENT SCHEDULE FOR LANDSLIDE SEDIMENT SOURCES IN THE SOUTH FORK ELK RIVER WATERSHED.	16

List of Tables

TABLE 1. SUMMARY OF ROAD AND SKID TRAIL RELATED SEDIMENT SOURCE TREATMENT IN SOUTH FORK ELK RIVER BY NUMBER AND SUB-BASIN FROM 1998-2011. VOLUME IS REPORTED IN CUBIC YARDS.	5
TABLE 2. TREATMENT SCHEDULE TOTALS FOR REMAINING SEDIMENT SOURCE SITES OCCURRING IN SOUTH FORK ELK RIVER.	9

List of Tables

FIGURE 1. PROGRESS IN REMEDIATION OF ROAD AND SKID TRAIL RELATED TREATABLE SEDIMENT SOURCE VOLUME IN SOUTH FORK ELK RIVER.	5
FIGURE 2. PROGRESS IN TREATING ALL SEDIMENT SITES AND SITES WITHIN A PARTICULAR ENVIRONMENTAL SCORE RANGE. RED SHADE INDICATES SITES WHICH HAVE BEEN TREATED. BLUE SHADE INDICATES PROJECTED TREATMENT SCHEDULE.	10



**PROJECT TITLE: SOUTH FORK ELK RIVER WATERSHED
SEDIMENT REDUCTION PLAN AND MASTER REASSESSMENT AND
TREATMENT SCHEDULE**

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Background

A master treatment schedule was originally submitted on August 7, 2007 as required per the South Fork Elk River Clean Up and Abatement Order # R1-2004-0048. The schedule set a treatment goal of 80% of the top 100 sites with the greatest potential for environmental impact by 2011. The 2007 schedule stated that a revised master treatment schedule would be submitted by 2012 to schedule the remaining sediment sources in the watershed. This report fulfills that obligation by providing a reassessment plan and schedule for the remaining treatable sediment source sites in South Fork Elk River.

Overview

The Master Treatment Schedule provides measurable implementation goals for achieving a specific amount of treatment work within a specified timeline. The Master Treatment Schedule for the watershed is the long-term plan that lays out the timetable and implementation milestones for treating the controllable sites and any other elements of the program that need to be completed in the watershed and that may vary each year. Each year HRC treats sediment sources on its roads and property in South Fork Elk River. The Sediment Source database provides a catalogue from which to select sites when developing each year's annual work plan.

The Master Reassessment and Treatment Schedule addresses:

- Sediment Source Inventories
- Source Treatment

All details of HRC's Sediment Treatment Program are carried out according to the General Sediment Source Treatment Plan that explains the steps and methods for sediment inventory of sediment sources, road standards and treatment priority mechanisms.

Sediment Source Treatment Progress to Date

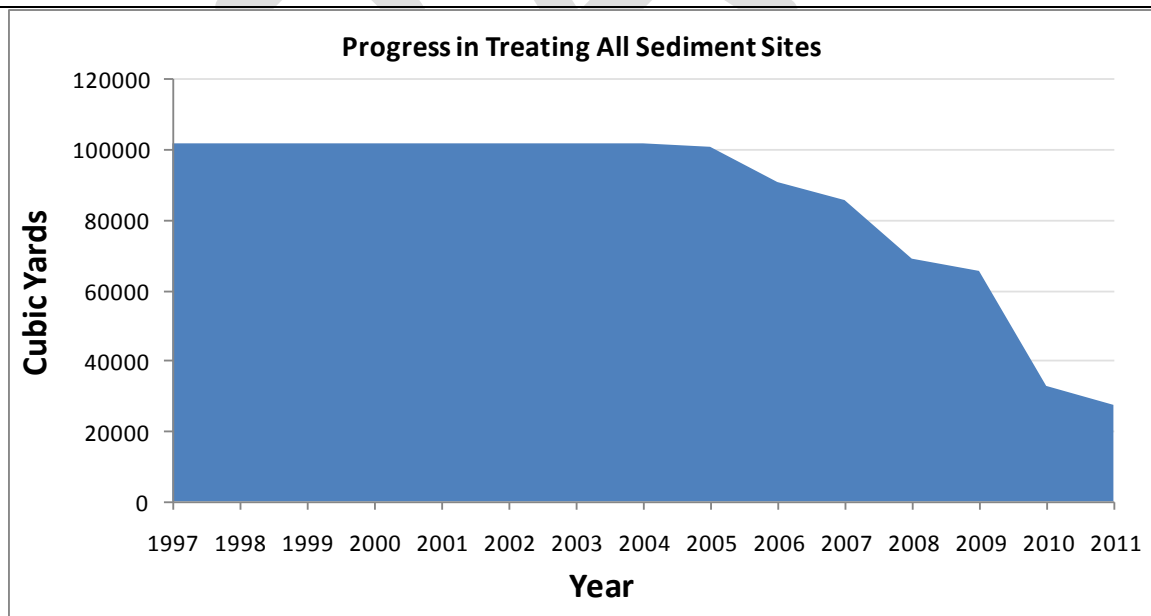
Stormproofing and related sediment control activities from 1998 to date (end of 2011) have been substantial in the South Fork Elk River watershed. A map of the completion status of individual sites is shown in Appendix A. The future potential volume of sediment in the sediment source inventory is considered retired when the site treatment is complete and is termed "sediment savings". The summation of sediment volume saved at the end of 2011 is listed by sub-basin in Table 1. Since 1998, a total of 874 road and skid trail related sediment sources (130,094 yd³) have been identified. Of those sites, 366 (28,249 yd³) were not feasible to treat. At the end of 15 years of the restoration program, a total of 74,432 yd³ of material have been "saved" at 352 sites. This is 73% of the treatable volume in the watershed (Figure 3). Since 2000, 39 landslides have been identified. Of those sites, 7 were considered infeasible to treat, 22 require further assessment, and 10 have been treated.



Table 1. Summary of road and skid trail related sediment source treatment in South Fork Elk River by number and sub-basin from 1998-2011. Volume is reported in cubic yards.

Sub basin	Total #	Total Volume	# Complete	Complete Volume	# Pending	Pending Volume	# No Treat	No Treat Volume
Upper South Fork Elk River	231	47803	169	40390	39	5088	23	2325
Tom Gulch	211	45882	102	27242	38	9816	71	8824
Railroad Gulch	95	10377	2	245	33	7484	60	2648
McCloud Creek	61	1028	6	395	0	0	55	633
Lower South Fork Elk River	276	25005	73	6160	46	5026	157	13819
Total	874	130094	352	74432	156	27414	366	28249

Figure 1. Progress in remediation of road and skid trail related treatable sediment source volume in South Fork Elk River.



Sediment Source Inventory Plan

Roads

A watershed-scale inventory of all existing roads was completed in South Fork Elk River in 1999. The inventory has been updated during Timber Harvest Plan development and road maintenance activities. The road inventory will continue to be updated in the future during these activities.

Landslides

The inventory of landslides in South Fork Elk River was first completed by PWA in 1999. The inventory was last updated by HRC in 2010 and submitted to the NCRWQCB staff. The landslide inventory will be updated following triggering storm events as defined in the Watershed Wide Waste Discharge Permit (R1-2006-0039).

Skid Trails

The South Fork Elk River Cleanup and Abatement Order (R1-2004-0048) require that skid trails be inventoried for sediment sources. Skid trail-related sediment sources have been identified during the 1999 PWA inventory and subsequent THP inventories and are included in the sediment source database for the watershed. This plan outlines the long-term plan for completing the inventory.

The skid trail inventory strategy has been driven by past land use history of tractor yarding. Knowledge of land use history was derived from PWA assessments including historical aerial photograph analysis, field surveys, and personal communications with resource managers knowledgeable about the area. Areas inventoried since 2006 are shown on the map in Appendix B.

Skid Trail Inventory Scheduling

Surveys will be conducted annually in coordination with the planning of other projects. These projects include THP layout, in which areas within and surrounding future harvest units will be surveyed; and road decommissioning projects, in which areas surrounding planned road decommissioning will be surveyed to avoid orphaning controllable sediment sources by removing potential access roads. WOP-56 is used to search for all sediment sources, including skid trail associated sources such as stream crossings, mechanically filled channels and landings.

These surveys would characterize all skid trail sources found, and would be on the alert for identifying high value mitigation opportunities. Off-road skid trail sites not in THP's must have a beneficial ecological effect (e.g. larger sediment potential either singly or in a cluster), and must pass an access/disturbance feasibility planning process to ensure HRC can develop feasible treatment plans and does not create more problems than treatment is worth. Although these may be a relatively small percentage of the sites that are found, they could have a disproportionately large payoff in sediment



saved. It should be assumed that only some fraction of the opportunities identified will ultimately be treated.

All non-tractored areas within THPs will be inventoried during THP preparation. HRC will work with the NCRWQCB to determine priorities on an annual basis.

Master Assessment and Treatment Schedule

Reassessment and Treatment of Sediment Sources

Treatment of road, off road and landslide sediment sources will ultimately be based on feasibility of treatment. During the planning phase for an annual plan, each scheduled site will be reassessed for appropriateness of treatment, using lessons learned from previous work in the drainage. If more damage will incur accessing or remediating the site, no treatment or delaying treatment will be proposed. If treatment is proposed, the current prescription will be reevaluated based on HRC's anticipated use of the road and success of similar treatments in the watershed. The determination as to whether a site can be treated/delayed or not will ultimately depend on the Area Forester's decision. Results of the re-assessment will be included with each annual plan.

Decisions on treatment of a site will be based the following key factors

- Future use of the road – Is the road is necessary for current or future operations? If so the site will likely be treated.
- Stability of site – Is the site stable, contributing minor amounts of sediment annually or likely to deliver large amounts in the near future.
- Risk of adjustment – Is there a strong likelihood proposed treatment will be effective at controlling sediment at the site.
- Sensitivity of adjustment – Can downstream beneficial uses handle post treatment site adjustment delivery rates which are significantly greater than existing pretreatment delivery rates.

Stable sites on roads that are not planned to be used and have a high potential for post activity adjustment will not be treated or delayed. Sites that are contributing minor amounts of sediment, with a low risk of adjustment will likely be treated.

Roads

The Master Treatment Plan for roads establishes the performance milestones based on the environmental sensitivity scoring system. The system assigns a score to each site based on



environmental risk. The scoring system has a wide point spread (0-1400), and can be used to rank the sites within the watershed. The score contains the treatment immediacy call used in the HCP, but enhances the overall priority by including several watershed and stream-related parameters that place each site in the context of its impact on public resources.

HRC has scheduled the remaining five years of work (Appendix C). The schedule front loads the higher ranked sites in the first two years of treatment. Eight (8) of the 13 sites with the highest environmental scores (500 to 1200) will be treated by 2014 (Figure 4). Table 2 indicates 8 of the 17 remaining top 100 sites will be treated by 2014. Forty eight (48) percent of the remaining treatable sediments source volume will be treated by 2014. This strategy guarantees that some sites are selected based on environmental considerations rather than operational considerations.

Minor adjustments in the schedule may occur due to weather or market conditions may occur annually. These adjustments will be reported to the NCRWQCB in the annual work plan and summary reports.

Skid Trails

For skid trail sediment sources where treatment is deemed beneficial and feasible, scheduling of actual treatment will be coordinated with the project which dictated the initial survey. All skid trail-related controllable sediment sources found within or surrounding the THP project will be addressed in the Erosion Control Plan for the THP. All sites will be completed within 5 years of THP approval, and in certain circumstances, where justified by imminent failure.

All skid-trail related controllable sediment sources whose treatment may be affected by road decommissioning projects will be addressed prior to or in coordination with the road decommissioning project.

THP-related sediment sources will typically use the THP to obtain necessary streambed alteration (SA) permits, while road decommissioning related sediment sources will typically be amended to the road decommissioning project as necessary to obtain SA permits. Off-road sites not covered by these permitting mechanisms will have to have a permitting vehicle before the work can be scheduled.

Twenty four (24) skid trail sites are scheduled to be completed by 2017 (Appendix D). Twenty two (22) off road sites are pending and will be reassessed or treated by 2017. More skid trail sites will likely be treated as THP's are prepared.

Landslides

Future landslides identified during inventories will be evaluated for treatment before the next summer operational period. If treatment is deemed feasible, sites will be treated within 2 years.

Twenty two (22) sites are scheduled to be assessed for treatment by 2013 (Appendix E).

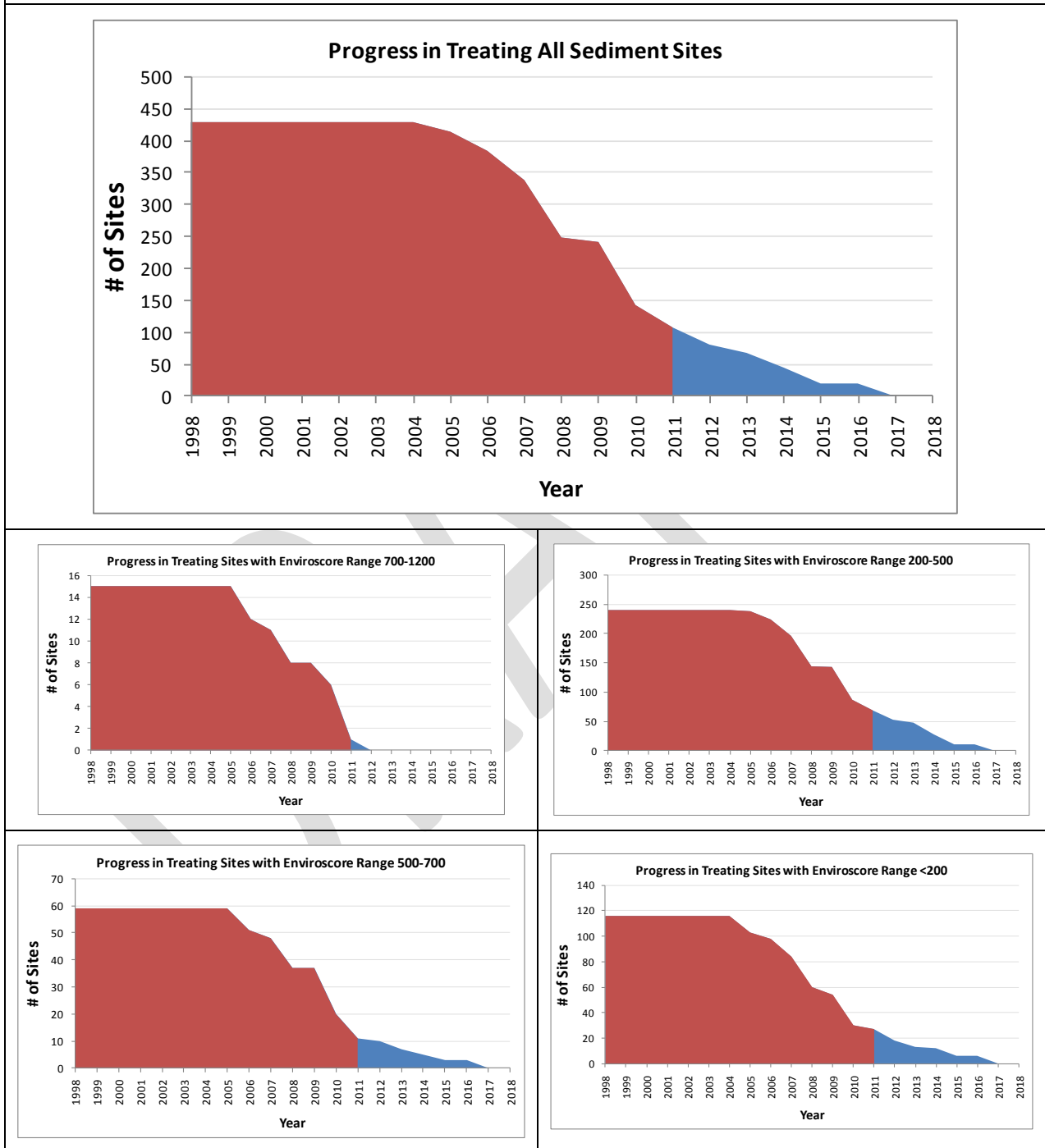


Table 2. Treatment schedule totals for remaining sediment source sites occurring in South Fork Elk River.

Year	Total #	Total Volume (cubic yards)	Top 100 Sites
2012	33	6470	3
2013	13	2067	3
2014	23	2838	2
2015	26	3580	5
2016	0	0	0
2017	20	8625	4



Figure 2. Progress in treating all sediment sites and sites within a particular environmental score range. Red shade indicates sites which have been treated. Blue shade indicates projected treatment schedule.



Appendices

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Appendix A. Map of site treatment status in South Fork Elk River.

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Appendix B. Map of skid trail inventories in South Fork Elk River

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Appendix C. Reassessment and treatment schedule for pending road related sediment sources in the South Fork Elk River watershed.

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**Appendix D. Reassessment and treatment schedule for pending off road
sediment sources in the South Fork Elk River watershed.**

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**Appendix E. Assessment schedule for landslide sediment sources in the
South Fork Elk River watershed.**

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