

Information Sheet: Draft Upper Elk River Sediment Source Analysis

Scope

Geographic area: The Draft Upper Elk River Sediment Source Analysis and subsequent load allocations is on the upper 44 mi² (76%) of 58 mi² Elk River Watershed and is comprised of North Fork, South Fork, and upper Mainstem forested lands. This area is prioritized as the primary contributor to sediment impairment and nuisance flooding conditions. Due to significant differences in landuse, sediment source and instream data availability, topography and geologic formations, the technical TMDL analyses separate and prioritize the Upper Elk from Martin Slough and Lower Elk.

Analysis time periods: Based upon aerial photo sets used in identification of sediment sources. 1955-1966, 1967-1975, 1975-1987, 1988-1997, 1998-2000, and 2001-2003. Analyses of the 2004-2006 and 2007-2010 time periods are pending based upon recent reporting.

Approaches

Sub-basin specific data: Where available, sub-basin scale estimates were developed.

Study sub-basins: Three sub-basins within Upper Elk River, including one reference and two managed areas, selected for more detailed field-based evaluation of drainage density, streambank erosion rates, and streamside landslide rates.

Management-related effects on drainage network: Conducted field-surveys of study sub-basins to evaluate natural and managed drainage area thresholds for channel initiation. Calculated natural and managed drainage density for analysis time periods.

	Sediment Source	Data Sources Relied Upon / Approach
Natural	Soil Creep	Literature
	Bank Erosion	Field surveys of 1.9 miles of channel in reference sub-basin; natural drainage density estimate
	Small Streambank Landslides	Field surveys of 2.6 miles of channel in reference sub-basin; natural drainage density estimate
	Shallow Hillslope Landslides	Landslide delivery volumes from areas not harvested in past 15 years in Upper Elk River
	Deep seated Landslides	CGS mapped active features; Palco Elk River WA movement rates
Management	Low Order Channel Incision	Volume of management induced channel incision based upon channel dimensions and field-based estimates of managed and natural drainage density; assumed 75% occurred in 1950's and 5% in each subsequent decade
	Management-Related Soil Creep	Soil creep to management-induce channel network
	Management-Related Bank Erosion	Field surveys of 3.9 miles of channel in managed study sub-basins; managed drainage density estimate; subtracted natural loading
	Management-Related Open Slope Shallow Landslides	Sub-basin specific landslide inventory data from Palco WA and 2005 ROWD; non-road-related slides, includes some skid-related slides
	Road-related Landslides	Sub-basin specific landslide inventory data from Palco WA and 2005 ROWD
	Management-Related Streamside Landslides	Field surveys of 6.5 miles of channel in managed sub-basins in Freshwater Creek; applied to natural drainage density estimate assuming bank erosion captured features in management-induced network; subtracted natural loading
	Management-Related Discharge Sites	Sub-basin specific site inventories from Palco WA, HRC CAO reports, GDRC WDR reports, BLM reports
	Post-Treatment Discharge Sites	Compiled monitoring results from BLM, HRC, and GDRC from sites treated in Elk River.
	Skid Trails	Compiled findings from Elk River skid-related inventories on BLM and HRC lands to estimate loading from skid sites not included in Management Discharge Site inventories
	Road surface erosion	Estimated sub-basin road densities in different road surface and condition categories based on Palco WA and ROWD; unit loading based upon Palco ROWD
Harvest surface erosion	Estimated harvest history in clear-cut equivalents based upon CDF, Palco WA, and Palco ROWD; unit loading based upon Palco WA	
BLM=Bureau of Land Management; CGS=California Geologic Survey; GDRC=Green Diamond Resource Company; HRC=Humboldt Redwood Company; Palco= Pacific Lumber Company; ROWD=Report of Waste Discharge; WA=Watershed Analysis; WDR=Waste Discharge Requirements		

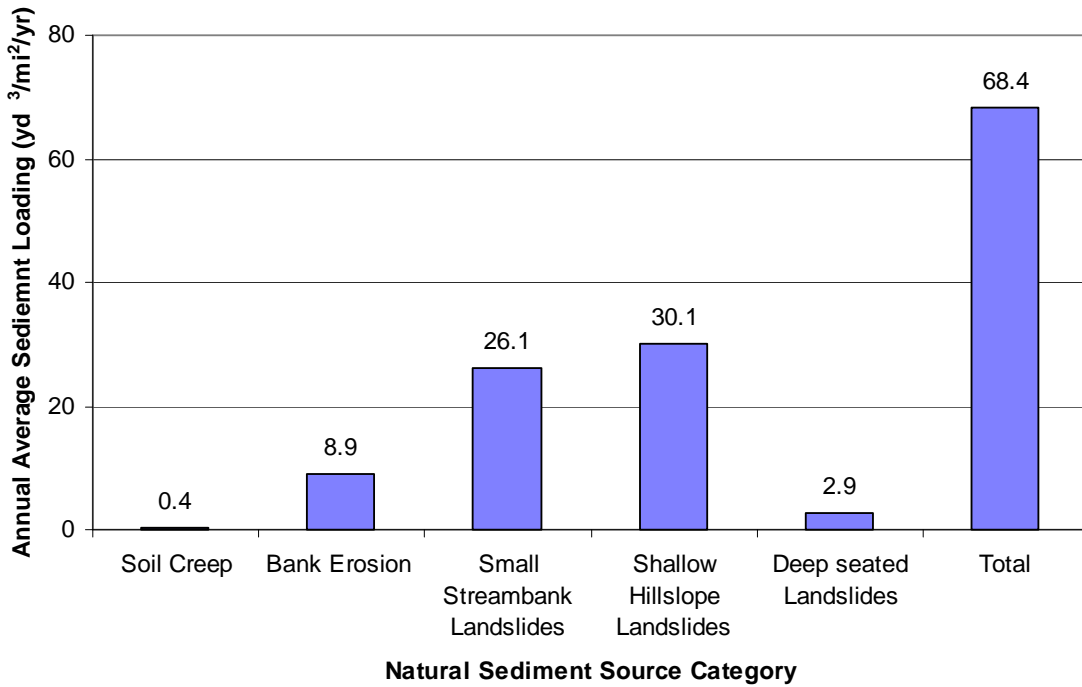


Figure 1. Summary of loading from natural sediment sources in Upper Elk River.

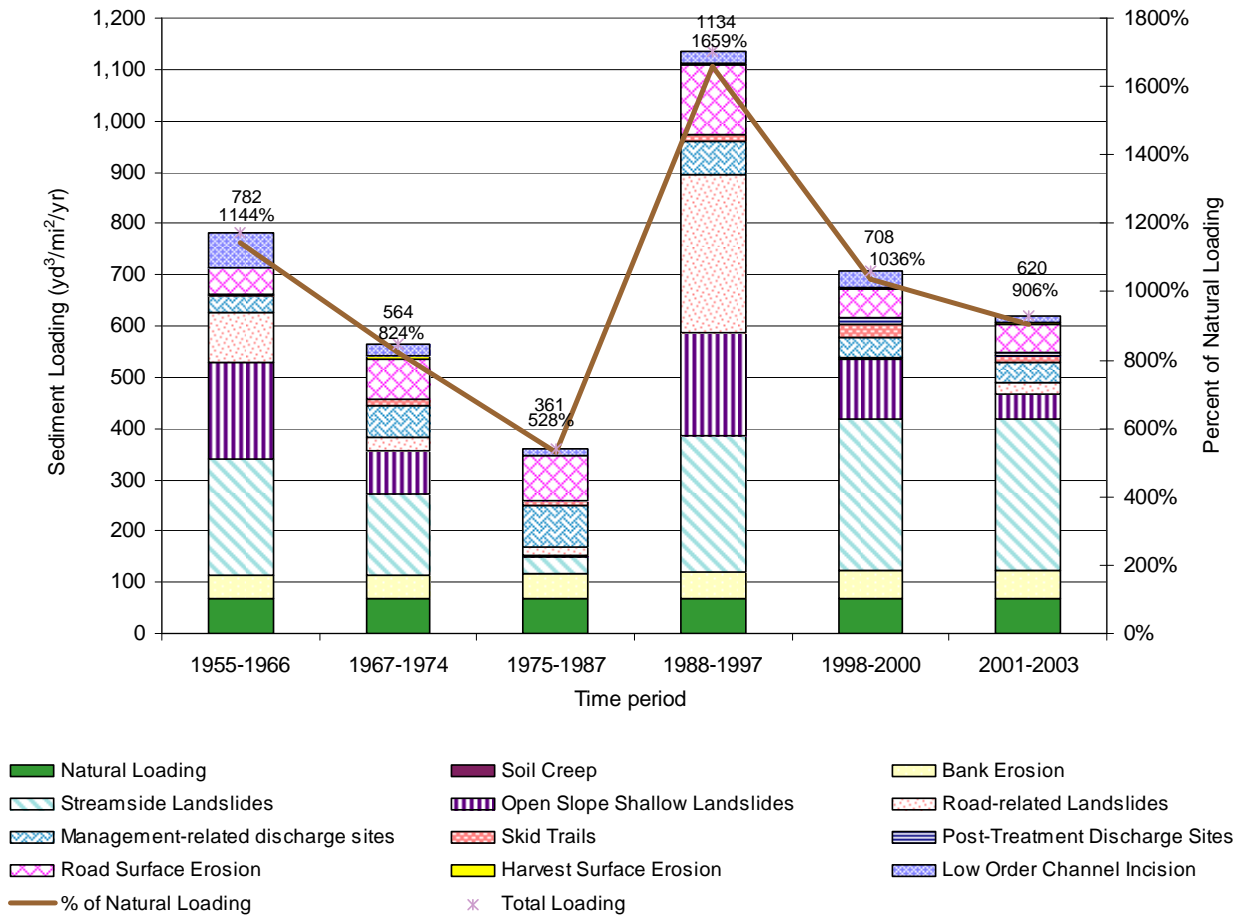


Figure 2. Summary of total sediment loading (bars and left axis) and percent of natural loading (line and right-axis) from natural and management sediment sources in Upper Elk River by analysis time period.