Section G
SEDIMENT INPUT SUMMARY

INTRODUCTION

The estimated sediment inputs for the Navarro WAU have been summarized and are presented. The purpose of this summary is to determine the relative amount of different sediment sources to assist with priorities for erosion control and interpretation of stream channel conditions in relation to sediment inputs. A sediment budget provides quantification of sediment inputs, transport, and storage in a watershed (Reid and Dunne, 1996). In this case we are not doing a true sediment budget, only an estimation of the sediment inputs. However, this estimation is useful for source analysis, numeric targets, and allocation of responsibility as needed in a Total Maximum Daily Load (TMDL) for 303(d) listed rivers, such as the Navarro River. However, care must be used when interpreting these estimated values; by no means can the estimates be considered absolute. Rather, the sediment input estimates are best interpreted for relative comparisons between processes and planning watersheds.

This section combines and summarizes the sediment input results from the Mass Wasting and Surface and Point Source Erosion modules of the watershed analysis for the Navarro WAU. Sediment input for the Navarro WAU is estimated from hillslope mass wasting, road associated mass wasting, road surface and point source erosion, and skid trail erosion. The sediment inputs have been estimated for thirty-two years (1969-2000).

SEDIMENT INPUTS

The average estimated sediment input for the past thirty-two years for the Navarro WAU is 1300 tons/square mile/year. The Navarro WAU is broken down into two areas Navarro West and Navarro East for sediment inputs (see Tables G-1 a and b for the planning watersheds that are in these areas). Sediment inputs over the last thirty two years in Navarro West have come from hillslope mass wasting (25%), road mass wasting (23%), road surface and point source erosion (49%) and to a lesser extent skid trail erosion (3%) (Figure G-1a). In Navarro East sediment inputs came from hillslope mass wasting (9%), road mass wasting (61%), road surface and point erosion (27%), and to a lesser extent skid trail erosion (3%) (Figure G-1b). The breakdown of total sediment input is presented by planning watershed for the Navarro WAU (Table G-1a and Table G-1b). The greatest amount of sediment inputs per unit area is estimated to be from the North Fork Indian Creek planning watershed, primarily due to one very large landslide within a proportionately smaller ownership area then other planning watersheds.

Road associated erosion is the dominant sediment contributing process in the Navarro WAU. The road associated mass wasting and surface and point source erosion combined to account for 88% of the estimated sediment inputs in the Navarro East. In Navarro West road associated mass wasting and road surface and point source erosion combined to account for 72% of the sediment input. Mass wasting from roads accounts for 61% of the sediment inputs in the Navarro East. While in Navarro West mass wasting associated with roads accounted for 23% of the sediment input. Future forest practices must give the potential of mass wasting and road erosion careful attention in the Navarro WAU to reduce this sediment input over time.

One road in the Navarro WAU has been responsible for a considerable amount of the management associated sediment inputs. That road is the Masonite Road (M Road). It is estimated that the Masonite Road has contributed about 30% of the surface and point source erosion in the Navarro WAU and is associated with 20% of the mass wasting sediment inputs. Our estimate of sediment yield for the past 32 years for the Masonite Road is 23,500 tons/yr. This equates to about 20% of the total sediment yield in the Navarro WAU the last 32 years.

Figure G-1a. Estimated Percentage of Sediment Input for Navarro West 1969-2000.

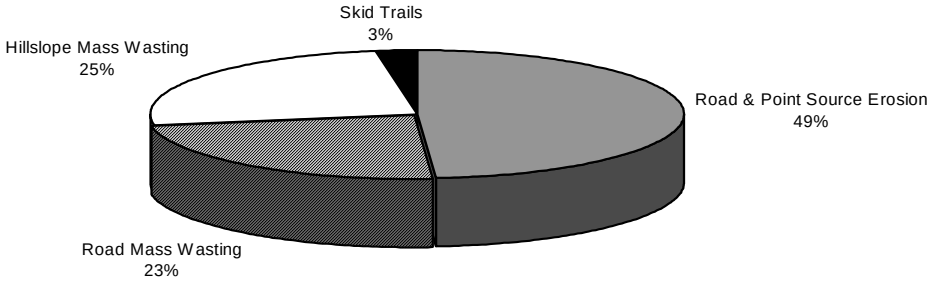

Figure G-1b. Estimated Percentage of Sediment Input for Navarro East 1969-2000.

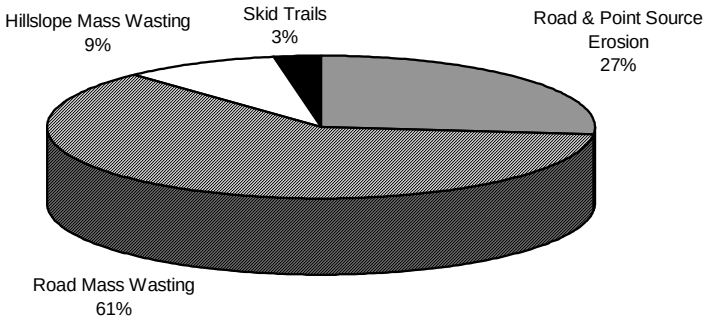

Table G-1a. Estimated Sediment Inputs by Input Type for Calwater Planning Watersheds of Navarro West, 1969-2000.

Planning Watershed	Road Surface and Point Source Erosion (Tons/Mi^2/Yr.)	Hillslope Mass Wasting (Tons/Mi^2/Yr.)	Road Mass Wasting (Tons/Mi^2/Yr.)	Skid Trails (Tons/Mi^2/Yr.)	Total (Tons/Mi^2/Yr.)
Rancheria Creek	1270	540	490	64	2364
Flynn Creek	105	118	93	10	326
Floodgate Creek	68	84	353	3	508
Hendy Woods	860	0	4	10	874
Lower Navarro River	221	214	235	13	683
Middle Navarro River	273	697	508	43	1521
Upper Navarro River	993	1020*	264	35	2312
Ray Gulch	1389	57	73	24	1543
North Fork Navarro River	316	126	178	42	662
Mill Creek	184	67	516	47	814

* -The higher percentage of hillslope mass wasting in Upper Navarro is due to a large deep-seated landslide (“Floodgate slide”).

Table G-1b. Estimated Sediment Inputs by Input Type for Calwater Planning Watersheds of Navarro East, 1969-2000.

Planning Watershed	Road Surface and Point Source Erosion (Tons/Mi^2/Yr.)	Hillslope Mass Wasting (Tons/Mi^2/Yr.)	Road Mass Wasting (Tons/Mi^2/Yr.)	Skid Trails (Tons/Mi^2/Yr.)	Total (Tons/Mi^2/Yr.)
Dutch Henry	311	187	1222	27	1747
Lower South Branch Navarro River	131	210	495	24	860
Middle South Branch Navarro River	518	193	935	86	1732
Upper South Branch Navarro River	238	114	534	66	952
Little North Fork Navarro River	753	48	604	68	1473
North Fork Indian Creek	267	244	3105**	1	3617
John Smith Creek	824	37	100	40	1001

**- high value due to one very large landslide within a relative small area of MRC land

LITERATURE CITED

Reid, L. and T. Dunne. 1996. Rapid evaluation of sediment budgets. Catena Verlag GMBH. Reiskirchen, Germany.