

SECTION C HYDROLOGY

INTRODUCTION

This section provides the available river peak flow data for the Navarro River. This is the closest stream gaging station to the Elk Creek WAU. The peak flow data is used to show the magnitude of storm events and when they occurred. High river peak flow events are indicative of the largest storms, with large storms typically comes high erosion and sediment transport events.

The Elk Creek WAU does not receive any significant snow accumulations that could contribute to rain-on-snow events. Current research shows possible cumulative effects from increased peak flows from forest harvest in rain-on-snow dominated areas (Harr, 1981). However, in rain dominated areas, increases in large stream peak flows (i.e. greater than a 20 year event) from forest harvesting are not found (Ziemer, 1981; Wright et. al., 1990). The Elk Creek WAU is a rain-dominated area in the temperate coastal zone of Northern California, therefore analysis on peak flow hydrologic change was not considered necessary

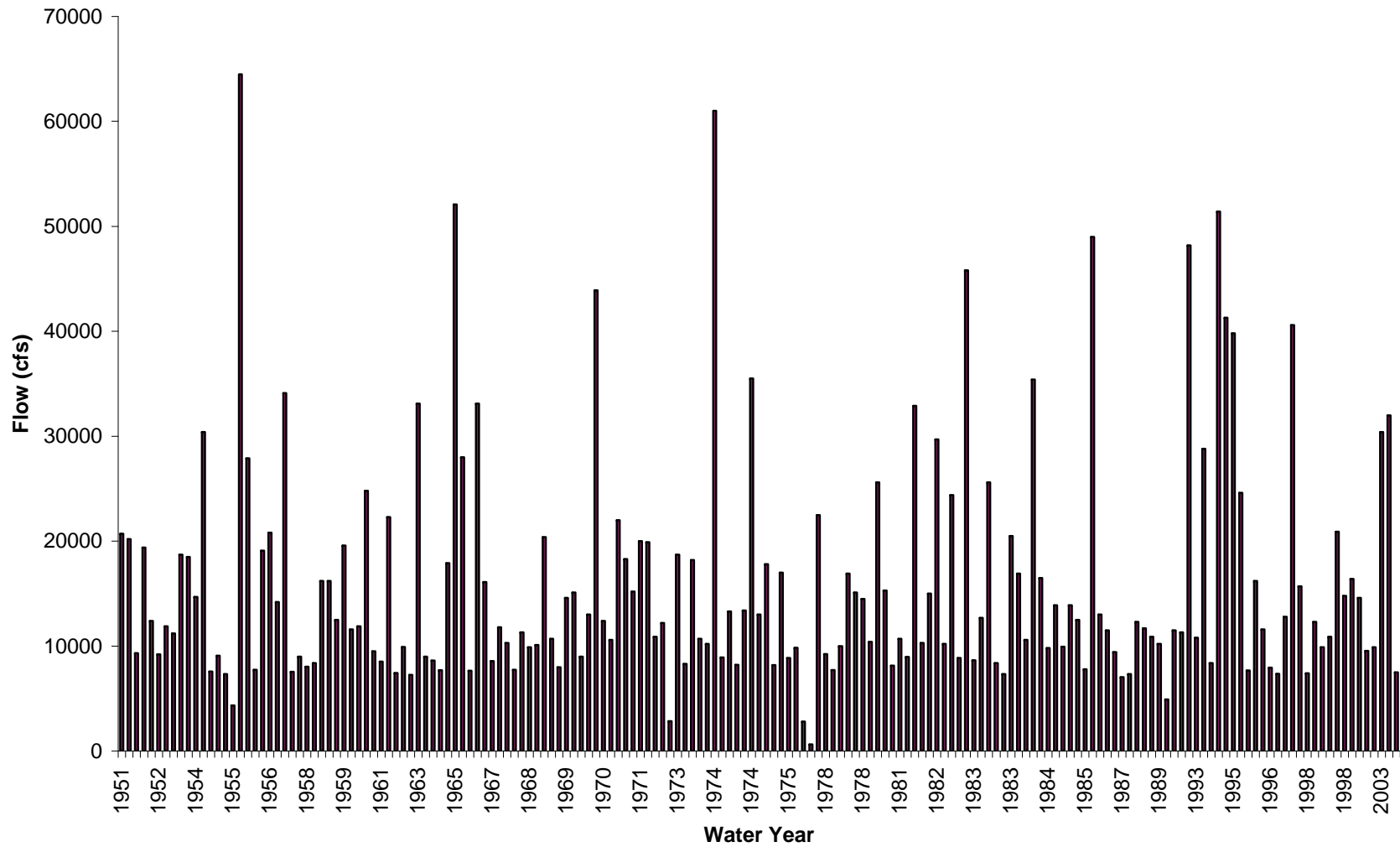
Peak Flows

The peak flow information was taken from the United States Geological Survey (USGS) gage 11468000, Navarro River, from water years 1951-2005. The USGS annual peak flow series was used to estimate the recurrence interval of the flood events of the Navarro River. An extreme value type I distribution (Gumbel, 1958) was fitted to the data. Table C-1 shows the estimated recurrence interval for peak discharges (in cubic feet per second, or cfs) in the basin.

Table C-1. Flood Recurrence for Peak Flows of the Navarro River, 1951-2005.

<u>Recurrence Interval (years)</u>	<u>Peak Discharge (cfs)</u>
1.1	4,931
2	19,800
5	33,340
10	42,317
25	53,661
50	62,076
100	70,430

Figure C-1. High Peak Flows (above base flow) for Navarro River, 1951-2005



Using the peak flow record from 1965-2003, the flood of record was in December 1956 (64,500 cfs) calculated to be a little more than a 50 year event for the Navarro River near Navarro (see Figure C-1). The lowest peak flow (630 cfs) occurred in 1977. This suggests that Elk Creek has been subjected to similar storms and magnitude as other watersheds of the area.

LITERATURE CITED

Gumbel, E.J. 1958. Statistics of extremes. Columbia University Press, New York.

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Wright, K.A., K. Sendek, R. Rice, and R. Thomas. 1990. Logging effects on streamflow: storm runoff at Caspar Creek in northwestern California. *Water Resources Research*, 26(7) 1657-1667.

Ziemer, R. 1981. Storm flow response to road building and partial cutting in small streams of northern California. *Water Resources Research*, 17(4) 907-917.