

## SECTION C HYDROLOGY

### INTRODUCTION

This section provides the available river peak flow data for the South Fork Gualala River. The closest stream flow station to the Gualala River 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 Gualala River 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. > 20 year event) from forest harvesting are not found (Ziemer, 1981; Wright et. al., 1990). The Gualala River 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

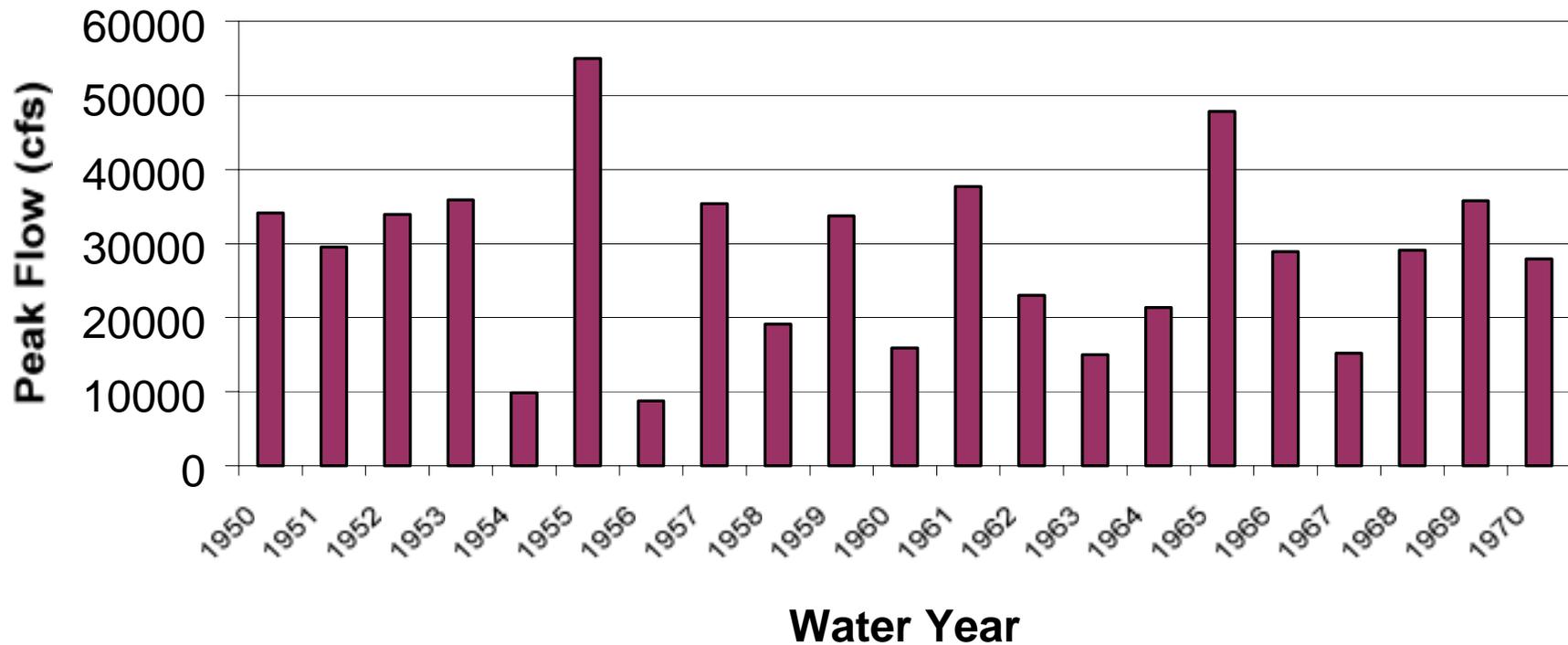
### Peak Flows

The peak flow information was taken from the United States Geological Survey (USGS) gage 11467500, South Fork Gualala River, from water years 1950-1970. To estimate the recurrence interval of the flood events of the South Fork Gualala River the USGS annual peak flow series was used. 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 the basin.

Table C-1. Flood Recurrence for Peak Flows of the Gualala River, 1952-1998.

<u>Recurrence Interval (years)</u>	<u>Peak Discharge (cfs)</u>
1.5	22000
2	26280
5	36790
10	43740
25	52530
50	59050
100	56530

**Figure C-1. South Fork Gualala River Peak Flows, 1950-1970**



Using the peak flow record from 1950-1970, the flood of record is 1955 (55,000 cfs) calculated to be greater than a 25 year event for the South Fork Gualala River (Table C-1). The second highest peak flow occurred in the 1965 water year, specifically December 1964. This is similar to most of the stream flow stations in the Mendocino and Sonoma County areas. Although this is a brief period of record, it suggests that the Gualala River has been subjected to similar storms and magnitude as other watersheds of the area. The high occurrence of these extreme storms suggests that the Gualala River WAU has been subjected to stressful hydrologic conditions and can be assumed to be a major contributor to the erosion and mass wasting delivered to the watercourses in the WAU.

#### **LITERATURE CITED**

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

Harr, D. 1981. Some characteristics and consequences of snowmelt during rainfall in western Oregon. *Journal of Hydrology*, 53: 277-304.

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.