

## SECTION C HYDROLOGY

### INTRODUCTION

This section provides the available river peak flow data for the South Fork Eel River at Leggett. 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 South Fork Eel river gaging station at Leggett encompasses flows from Hollow Tree Creek, but also incorporates drainage from a larger watershed. However given its close proximity this peak flow data is assumed indicative of the timing and magnitude of large flow events in Hollow Tree Creek.

The Hollow Tree 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. > 20 year event) from forest harvesting are not found (Ziemer, 1981; Wright et. al., 1990). The Hollow Tree 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

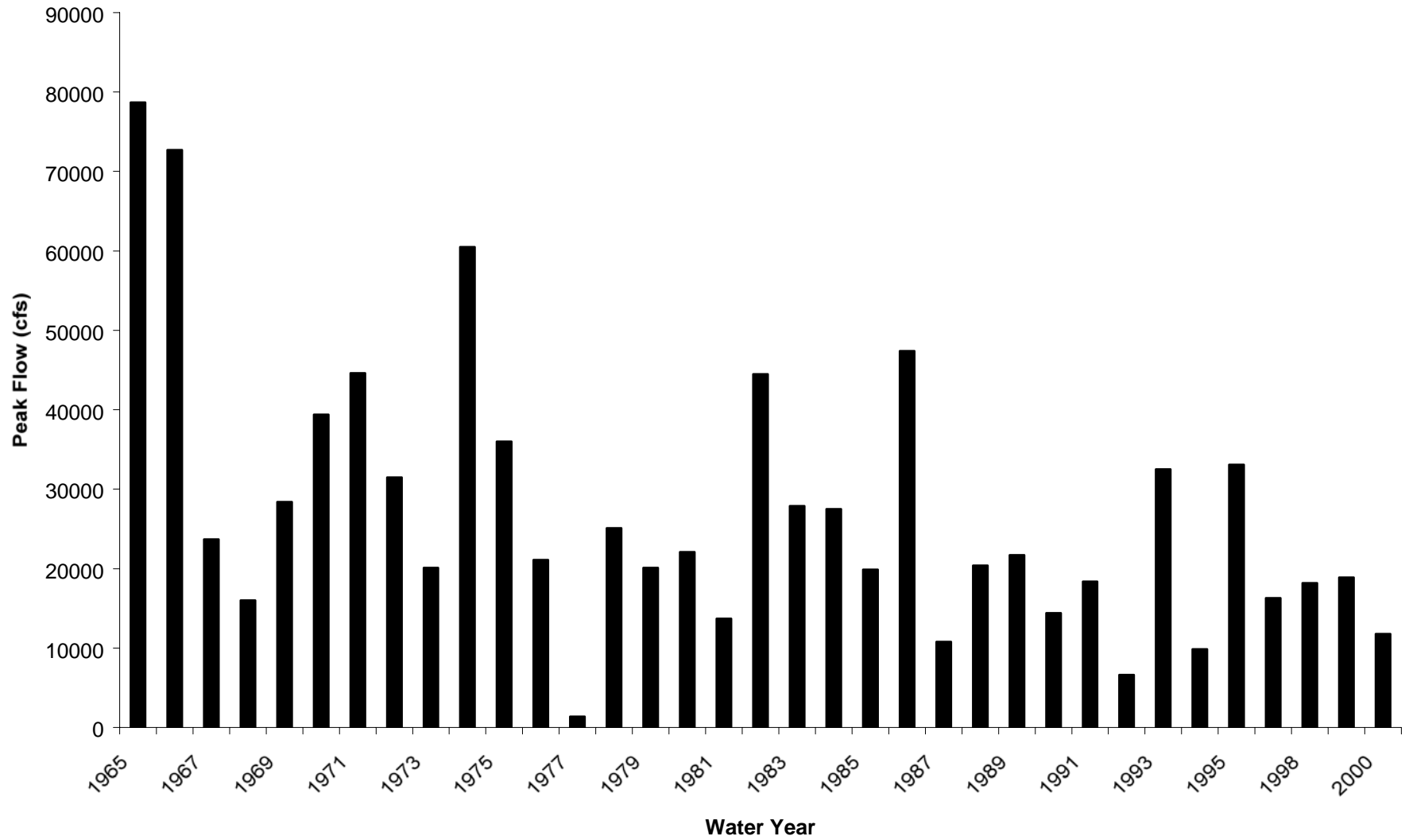
### PEAK FLOWS

The peak flow information was taken from the United States Geological Survey (USGS) gage 11475800, South Fork Eel River at Leggett, from water years 1965-2000 (excluding 1997, no peak flow data available for this year). Annual peak flows are shown over the period of record (Figure C-1). To estimate the recurrence interval of the flood events of the South Fork Eel 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 the basin.

Table C-1. Flood Recurrence for Peak Flows of the South Fork Eel at Leggett, 1965-2000.

<u>Recurrence Interval (years)</u>	<u>Peak Discharge (cfs)</u>
1.1	7710
1.5	18240
2	24450
5	39740
10	49860
25	62650
50	72140
100	81560

**Figure C-1. South Fork Eel River (at Leggett) Peak Flows, Water Years 1965-2000**



Using the peak flow record from 1965-2000, the flood of record is December, 1964 (Water Year 1965) at 78,700 cubic feet per second calculated to be greater than a 80 year event for the South Fork Eel and thus assumed the same for Hollow Tree Creek (Table C-1). Each decade there has been at least one peak greater than or equal to a 10 year event with the exception of the 1990s. In the 1990s there have been 2 storms greater than a 2 year recurrence interval (1993 and 1995) and 5 storms greater than a 1.5 year recurrence. The occurrence of these storms suggests that the Hollow Tree Creek WAU has been subjected to stressful hydrologic conditions, particularly in the 1960-1980's time period possibly creating a greater incidence of landslides, road failures or surface erosion than the 1990's decade. However, the 1990's still received large storms.

Throughout the last 40-50 years in the Hollow Tree Creek WAU, based on South Fork Eel River flow data, there have been 3 flood events >20 year recurrence (Figure C-1). These flood events occurred in 1965, 1966 and the 1974 water years. There has been one additional 10-year event, this occurred in 1986. Large events have the capacity to re-shape river or stream channels and transport large sediment loads. The meteorological events that created these large floods also can be assumed to be a major contributor to the erosion and mass wasting delivered to the watercourses in the WAU.

### **LITERATURE CITED**

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