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WATER SURFACE ELEVATIONS AND CHANNEL CHARACTERISTICS FOR SELECTED REACHES OF THE ROGUE RIVER AND ELK CREEK

Jackson And Josephine Counties, Oregon

U.S. GEOLOGICAL SURVEY
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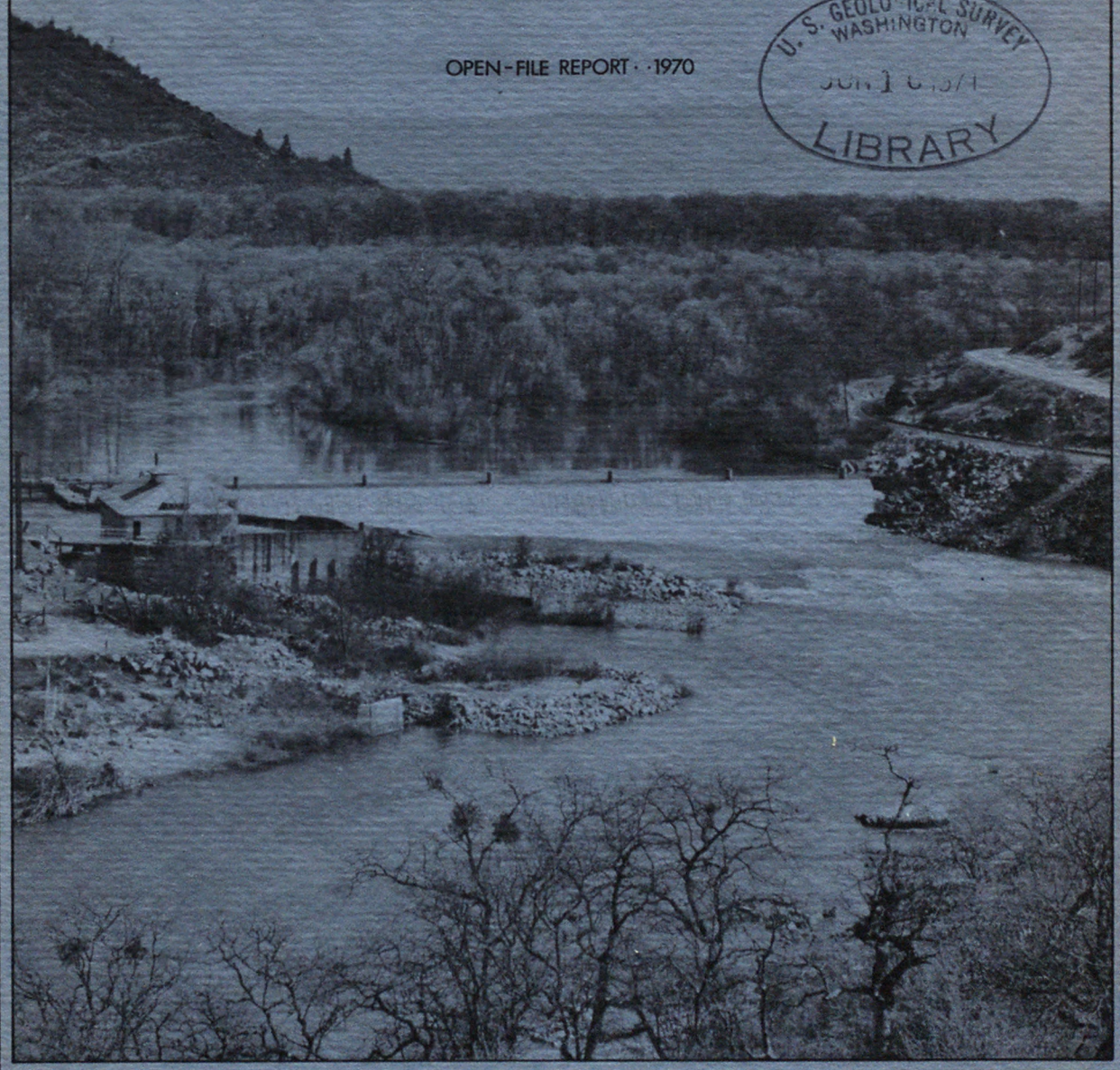

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UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
Water Resources Division

WATER-SURFACE ELEVATIONS AND CHANNEL CHARACTERISTICS FOR SELECTED REACHES OF THE ROGUE RIVER AND ELK CREEK, JACKSON AND JOSEPHINE COUNTIES, OREGON

By D. D. Harris, 1925

223935

Prepared in cooperation with Jackson County
and the Oregon State Water Resources Board

OPEN-FILE REPORT

Portland, Oregon
1970

UNITED STATES DEPARTMENT OF THE INTERIOR
WALTER J. HICKEL, *Secretary*

Geological Survey
William T. Pecora, *Director*

Water Resources Division
Ernest L. Hendricks, *Chief Hydrologist*

Oregon District
Stanley F. Kapustka, *District Chief*

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UNITED STATES GOVERNMENT

Memorandum

TO : Library, U.S. Geological Survey, Washington, D. C.

DATE: September 11, 1970

FROM : District Chief, WRD, Portland, Oreg.

SUBJECT: PUBLICATIONS--Open-file report "Water-surface elevations and channel characteristics for selected reaches of the Rogue River and Elk Creek, Jackson and Josephine Counties, Oregon," by D. D. Harris

Enclosed is a copy of subject report for your library.

Roy B. Sanderson
for Stanley F. Kapustka

Enclosure

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WATER-SURFACE ELEVATIONS AND CHANNEL CHARACTERISTICS FOR SELECTED REACHES OF THE ROGUE RIVER AND ELK CREEK, JACKSON AND JOSEPHINE COUNTIES, OREGON

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By D. D. Harris

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INTRODUCTION

The central Rogue River valley, because of its mild climate, fertile soil, scenic attractions, and sport-fishery resource, has great potential for future population growth and industrial development. As the population grows and the area develops, zoning becomes necessary to assure the most beneficial use of the land, especially of the flood plains. To establish land-use zones on the flood plains, the area subject to inundation and elevation of floods must be considered. Areas flooded during the December 1964 flood and the approximate limits of the 1861 flood in Jackson and Josephine Counties are shown in two interim reports (Corps of Engineers, 1965); however, there are no published flood-elevation profiles to use as a basis for establishing meaningful land-use-zone boundaries or for delineating inundated areas of other floods.

This study was made at the request of Jackson County to define water-surface profiles and channel characteristics, geometry and slope, for a reach of the Rogue River from the Jackson-Josephine County line upstream to Lost Creek damsite and for a reach of Elk Creek from the mouth upstream to Elk Creek damsite (fig. 1). Profiles were defined for (1) the flood of December 1964; (2) the 20-year flood; (3) the 10-year flood; (4) the flood of December 1964 after adjusting for storage in the proposed upstream reservoirs; (5) a low flow considered to be the minimum operational flow from the proposed reservoirs; and (6) the thalweg (the lowest part of the channel bottom).

The December 1964 flood data, adjusted for proposed storage, and minimum operational flow were provided by the Corps of Engineers (Col. R. L. Bangert, written commun., 1969).

The profile of the adjusted December 1964 flood was determined for the reach of the Rogue River downstream from Dodge Bridge where adjusted discharge data were available.

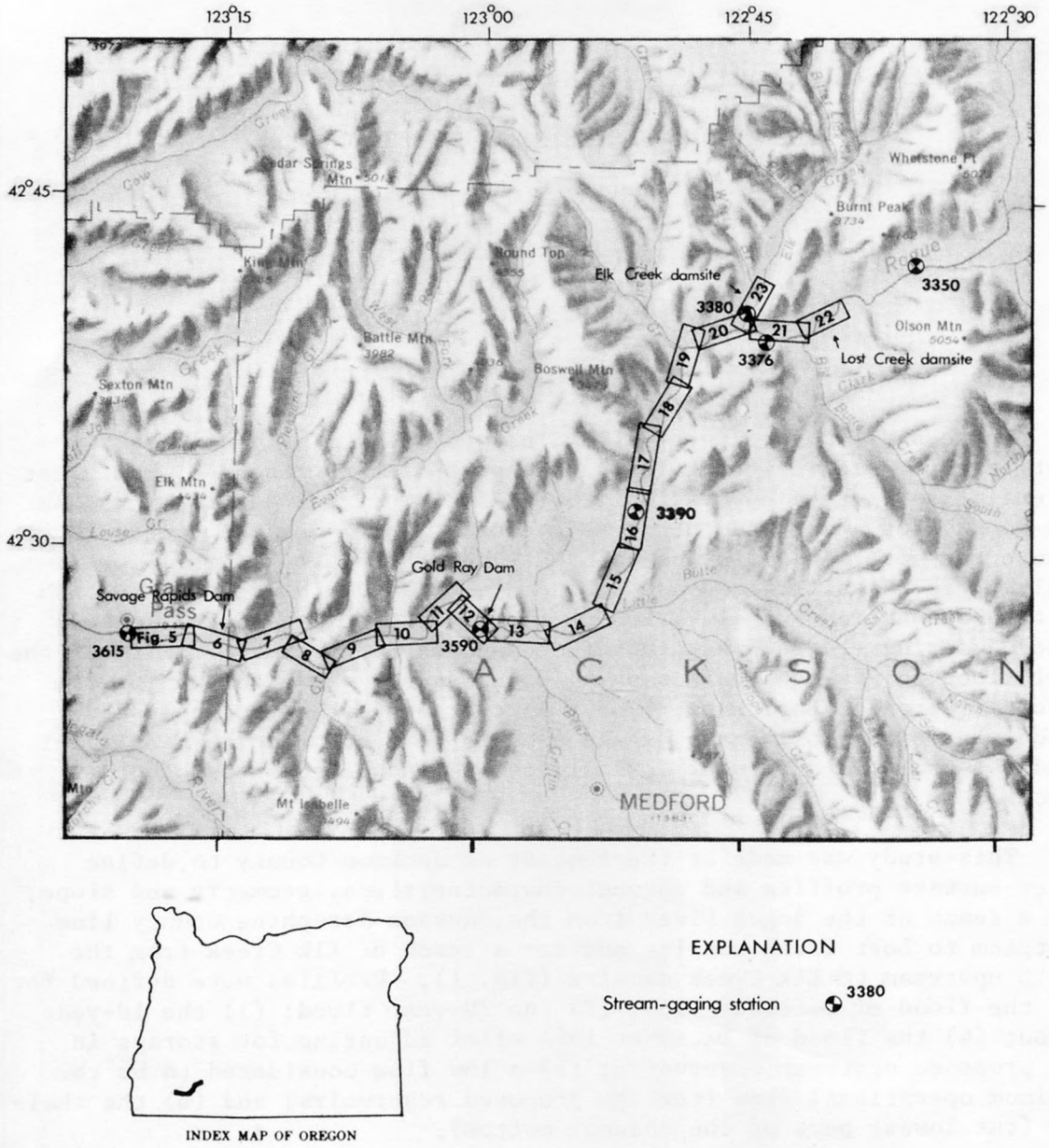

Figure 1.--Location of the study area.

The minimum operational flow needed primarily for fishery enhancement is the minimum release proposed from Lost Creek and Elk Creek Reservoirs. For the purpose of this study, a minimum operational flow (proposed for October) of 1,000 cfs (cubic feet per second) below the proposed Lost Creek Dam was used in developing the profile. Smaller minimum releases are proposed for other months of the year, but because natural flow and tributary inflow are lowest in September or October, flow throughout the entire study reach should be lowest during these months. The profile of the minimum operational flow was not determined for the reach downstream from Savage Rapids Dam, where flow can be diverted, or for Elk Creek. The Elk Creek low-water profile is not shown because the proposed minimum operational flow is only 25 cfs and would be very close to the thalweg profile.

The step-backwater method was used to define the high-water profiles; photogrammetric maps and water-depth soundings made during the periods of low flow were used to define the low-water and thalweg profiles. The theory of the step-backwater method, described in Geological Survey Water-Supply Paper 1869-A (Bailey and Ray, 1966) and in many textbooks on hydraulics involves the use of hydraulic equations expressed as functions of channel geometry, roughness, and slope.

This report is not intended to show the areas inundated by the selected floods. Such information can be determined by using the flood elevations in conjunction with the contoured photogrammetric work maps.

Elevations computed for the 2-, 25-, and 50-year floods are not included in this report, but elevations for parts of the study reach are available in the Oregon District office of the U.S. Geological Survey.

This study was made, in cooperation with Jackson County and the Oregon State Water Resources Board, under the general supervision of Stanley F. Kapustka, district chief of the Water Resources Division of the U.S. Geological Survey in Oregon.

DESCRIPTION OF THE STUDY REACHES

The study reach on the Rogue River extends 56 miles between the Grants Pass gaging station, where the low-water elevation is about 900 ft above msl (mean sea level) and Lost Creek damsite, where the low-water elevation is about 1,560 ft above msl (fig. 1). On Elk Creek the reach extends 1.7 miles between the mouth, where the low-water elevation is about 1,450 ft above msl, and Elk Creek damsite, where the low-water elevation is about 1,510 ft above msl.

From Grants Pass upstream to Rock Point, the channel is confined and the slope decreases. This reach includes Savage Rapids Dam, which is used primarily for irrigation diversion. Stoplogs are placed on the crest of the dam to raise the upstream pool elevation during the irrigation season and are removed during the period of high flow, November through March. This manipulation of the stoplogs influences profiles upstream from the dam. The average channel slope is about 8 feet per mile.

From Rock Point upstream to Gold Ray Dam, the channel is narrow and steep. There is a notable break in the profile at a falls about a mile upstream from Gold Hill bridge. High velocities through the narrow constrictions at Gold Hill and Rock Point (figs. 9, 10) have created deep scour holes. At these constrictions, depths greater than 30 feet were sounded during a period of low flow. These were the greatest depths found in the entire study reach. Average slope through this part of the channel is about 13 feet per mile.

Between Gold Ray Dam and Little Butte Creek, the flood plain is flat and wide (as much as 7,000 ft) and is susceptible to inundation during periods of high flow. Backwater from Gold Ray Dam, which is used for power development, influences the slope of the water-surface profile. The wide, meandering channel in this reach has a slope of about 8 to 9 feet per mile.

The upper 20-mile reach of the Rogue River is generally well confined and widens gradually downstream to Little Butte Creek. This upper reach contains occasional rapids or low falls, most of which become submerged during high flow. Channel slope above Little Butte Creek averages about 15 feet per mile.

The 1.7-mile reach of Elk Creek is generally well confined, although some lowland flooding occurred in the downstream part of the reach in December 1964. The channel slope averages 32 feet per mile.

Figure 2.--Gold Ray bridge during December 1964 flood. Photograph courtesy of Medford Mail Tribune.

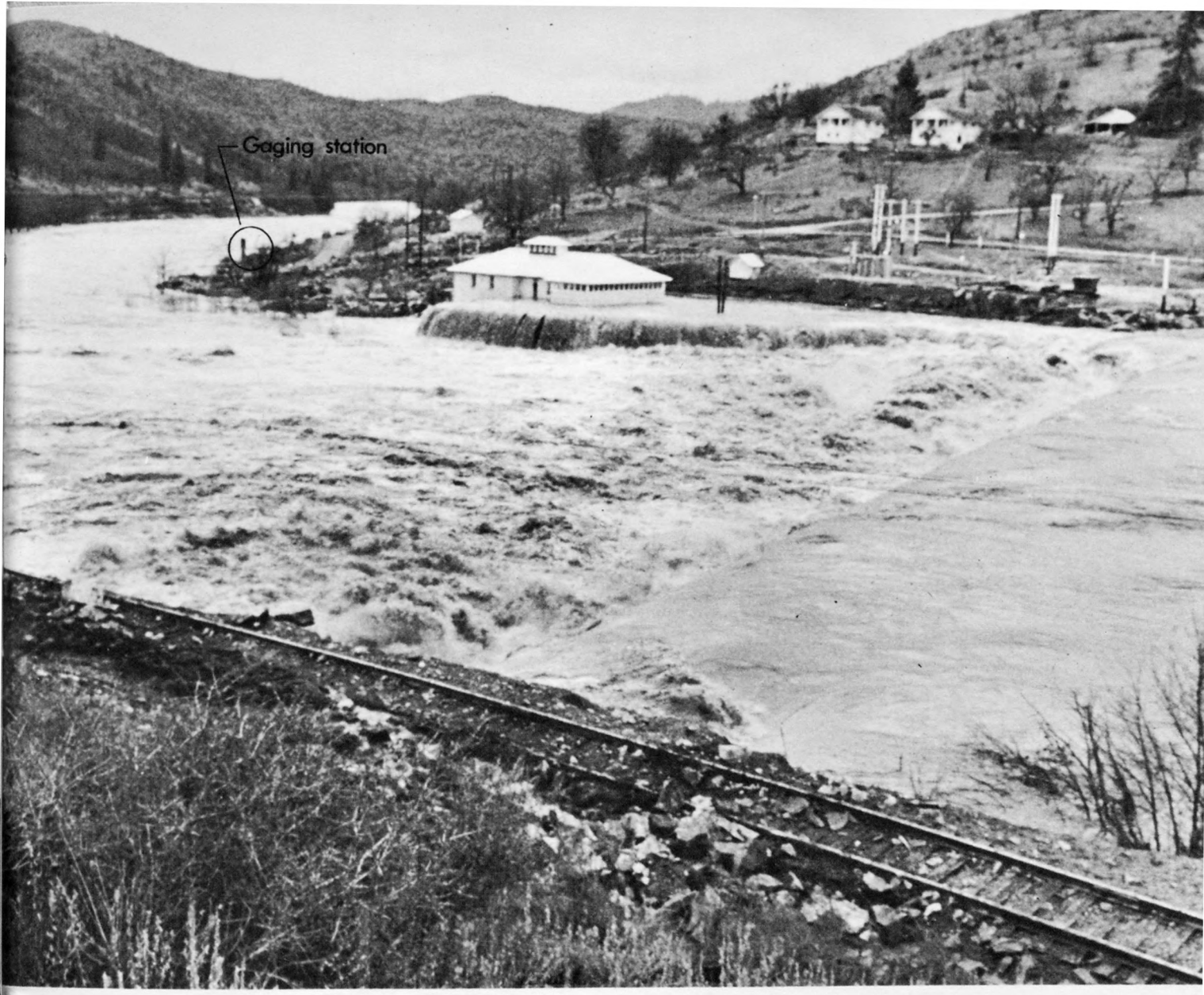

Figure 3.--Gold Ray Dam and Raygold gaging station during December 1964 flood. Photograph courtesy of Medford Mail Tribune.

FLOODS IN THE ROGUE RIVER VALLEY

Highest flows of the Rogue River usually occur from late fall to early spring. All but two of the annual peaks in 64 years of record for the gaging station below Gold Ray Dam (station 3390) occurred during November through March. The annual peaks are listed in table 1. The highest peak of record was that of December 1964, although higher peaks occurred in 1861 and 1890, prior to operation of the gaging station. Figure 2 shows the pileup of water on Gold Ray bridge just before its destruction during the December 1964 flood. Figure 3 shows flow over Gold Ray Dam during the December 1964 flood and after Gold Ray bridge was destroyed. The bridge was located between the dam and the gaging station shown in the picture.

Table 1.--Annual peaks for Rogue River at Raygold, near Central Point, Oreg. (station 3590)

Water year	Date	Elevation (in feet above msl)	Discharge (in cfs)
1862	December 1861	1,154	--
1890	February 1890	1,149.3	--
1906	Jan. 16, 1906	1,135.5	a/38,800
1907	Feb. 4, 1907	1,138.8	a/56,000
1908	Dec. 26, 1907	1,137.1	a/46,700
1909	Jan. 20, 1909	1,133.8	a/31,100
1910	Nov. 23, 1909	1,144.3	a/92,800
1911	Nov. 28, 1910	1,134.9	a/35,500
1912	Feb. 17, 1912	1,136.0	a/41,200
1913	Jan. 18, 1913	1,129.1	a/14,200
1914	Jan. 22, 1914	1,131.8	23,500
1915	Feb. 1, 1915	1,129.2	15,400
1916	Feb. 7, 1916	1,130.9	20,600
1917	Feb. 25, 1917	1,128.5	12,300
1918	Jan. 12, 1918	1,132.7	25,800
1919	Feb. 9, 1919	1,130.8	19,200
1920	Dec. 25, 1919	1,127.3	8,980
1921	Dec. 30, 1920	1,132.3	24,400
1922	Nov. 30, 1921	1,130.9	19,600
1923	Dec. 31, 1922	1,130.6	18,600
1924	Feb. 7, 1924	1,129.1	14,400
1925	Dec. 30, 1924	1,137.0	44,400
1926	Feb. 4, 1926	1,127.7	10,000
1927	Feb. 21, 1927	1,146.6	110,000
1928	Mar. 26, 1928	1,132.5	26,100
1929	Jan. 3, 1929	1,127.6	9,730
1930	Dec. 19, 1929	1,129.3	14,800
1931	Apr. 1, 1931	1,127.1	8,420
1932	Mar. 19, 1932	1,134.0	31,900
1933	Jan. 2, 1933	1,130.2	17,800
1934	Jan. 23, 1934	1,127.8	10,600
1935	Dec. 20, 1934	1,128.6	12,700

a/ Maximum observed.

Table 1.--Annual peaks for Rogue River at Raygold, near Central Point, Oreg. (station 3590)--Continued

Water year	Date	Elevation (in feet above msl)	Discharge (in cfs)
1936	Jan. 15, 1936	1,132.0	24,200
1937	Apr. 13, 1937	1,132.5	26,100
1938	Dec. 11, 1937	1,132.8	27,200
1939	Mar. 12, 1939	1,129.4	15,200
1940	Feb. 28, 1940	1,132.0	24,200
1941	Jan. 25, 1941	1,129.1	14,100
1942	Dec. 3, 1941	1,132.2	25,200
1943	Dec. 31, 1942	1,136.1	40,500
1944	Nov. 5, 1943	1,126.8	8,060
1945	Feb. 14, 1945	1,132.8	27,100
1946	Dec. 28, 1945	1,137.8	48,000
1947	Nov. 19, 1946	1,128.2	11,500
1948	Jan. 7, 1948	1,137.4	46,200
1949	Feb. 22, 1949	1,130.9	20,400
1950	Mar. 19, 1950	1,131.1	21,100
1951	Oct. 29, 1950	1,136.7	43,100
1952	Feb. 2, 1952	1,133.2	28,900
1953	Jan. 18, 1953	1,139.6	56,500
1954	Nov. 23, 1953	1,138.7	52,300
1955	Dec. 31, 1954	1,127.3	9,210
1956	Dec. 22, 1955	1,144.9	110,000
1957	Mar. 12, 1957	1,134.4	39,300
1958	Jan. 28, 1958	1,135.5	44,900
1959	Feb. 15, 1959	1,128.2	12,800
1960	Feb. 9, 1960	1,131.8	26,300
1961	Feb. 11, 1961	1,130.1	19,300
1962	Dec. 19, 1961	1,129.9	18,400
1963	Dec. 2, 1962	1,140.9	88,900
1964	Jan. 20, 1964	1,133.7	36,300
1965	Dec. 23, 1964	1,145.2	131,000
1966	Jan. 6, 1966	1,133.9	37,400
1967	Jan. 28, 1967	1,131.7	26,000
1968	Feb. 23, 1968	1,132.9	32,000
1969	Jan. 13, 1969	1,130.1	18,900

Table 2.--Discharges used in developing the flood profiles

Gaging station[1/]	Discharge, in cubic feet per second			
	December 1964 flood	December 1964 flood (adjusted)	20-year flood	10-year flood
Rogue River below South Fork Rogue River, near Prospect (3350)	55,000	--	29,500	20,800
Elk Creek near Trail (3380)	19,200	--	14,800	11,900
Rogue River at Dodge Bridge, near Eagle Point (3390)	87,600	24,600	61,500	46,600
Rogue River at Raygold, near Central Point (3590)	131,000	74,000	81,000	61,700
Rogue River at Grants Pass (3615)	152,000	102,000	119,000	93,200

1/ Number following station name is the gaging station number.

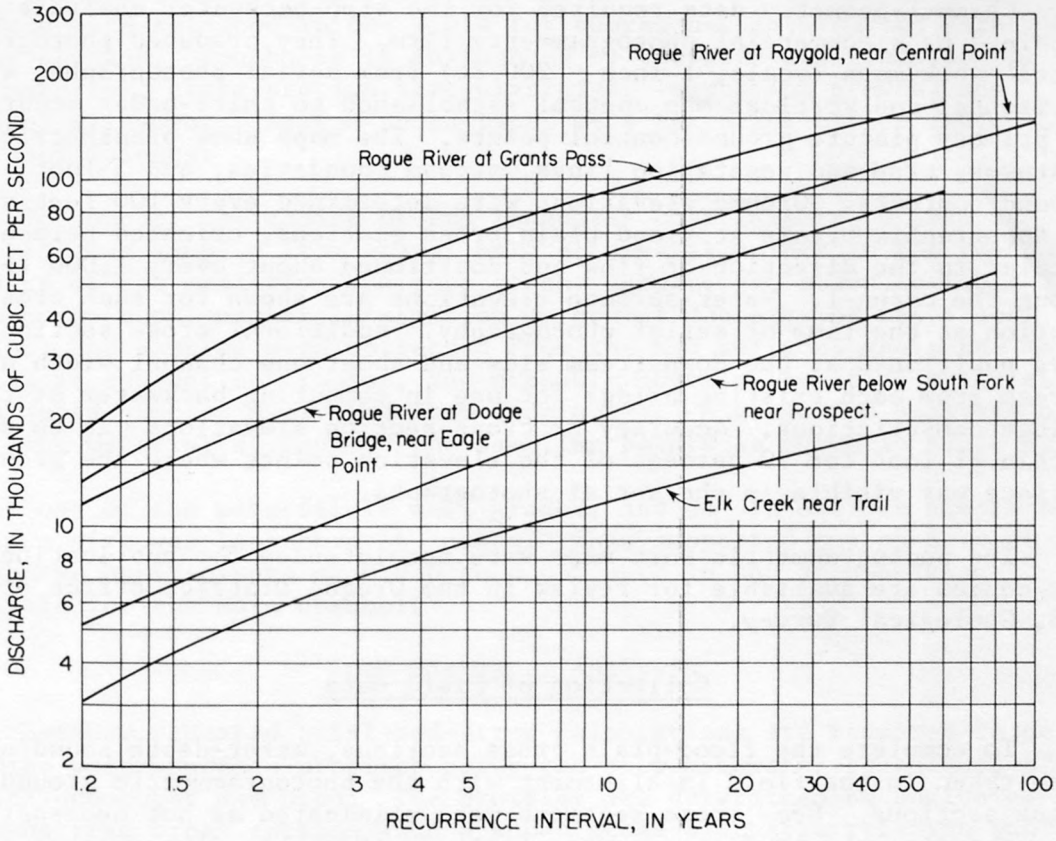

Figure 4.--Flood-frequency curves for gaging stations in the study area.

Flood-frequency curves for five gaging stations in the study area are shown in figure 4. The curves were developed from annual peak-flow data by using the log-Pearson Type III method (Hydrology Subcommittee, 1967). Flood-frequency data for the gaging station on Rogue River below South Fork was used in the analysis even though the gaging station was upstream from the study reach (fig. 1) and is no longer in operation. The gaging station on Rogue River near McLeod (station 3376, figs. 1, 21) has been in operation only since 1965 and therefore has insufficient data for use in a flood-frequency analysis.

Flood discharges used in the analyses are shown in table 2. The 10- and 20-year floods listed in table 2 are floods that will recur on on an average of once every 10 and 20 years, respectively. These recurrence intervals might also be considered to have a 1 chance in 10 and a 1 chance in 20 of occurring in any one year. Discharges used in developing the profiles between gaging stations were interpolated in proportion to drainage areas of intervening tributaries.

Photogrammetric Mapping

Channel-geometry data required for the step-backwater analysis were obtained by a commercial photogrammetry firm. They produced photogrammetric work maps (scale, 1 inch = 200 ft) from aerial photographs, with horizontal and vertical map control established to third-order accuracy at primary picture ground-control points. The maps show planimetric features, tree and vegetation lines, stream boundaries, and 5-foot ground contours. Ground elevations were determined every 100 feet and at topographic breaks at flood-plain cross sections, oriented perpendicular to the direction of flow and positioned about every 1,000 feet along the channel. Water-surface elevations are shown for each cross section at the time of aerial photography. Additional cross sections were positioned at the downstream side and about one channel width upstream from each existing bridge for use in computing backwater at the bridge constrictions. Accuracy of cross-section elevations was to be within ± 1 foot for 90 percent of the elevation points where the ground surface was visible in the aerial photographs.

The photogrammetric work maps were not intended for publication, but copies are available for review in the Oregon District office of the U.S. Geological Survey.

Collection of Field Data

To complete the flood-plain cross sections, water-depth soundings were taken in the field in alinement with the photogrammetric ground cross sections. Some cross sections were eliminated as not necessary for computing the profiles, particularly in straight, flat reaches of the streams. The alinements of some sections were altered slightly where adjacent cross sections overlapped at sharp bends in the channel.

Spot checks made with an engineering level indicated that the photogrammetric elevations were within the accuracy required as shown under "Photogrammetric mapping."

Bridge dimensions required for computing the amount of backwater upstream from bridges were measured by field survey.

Roughness Coefficients

Channel roughness coefficients required in the hydraulic computations were selected in the field for subreaches adjacent to each cross section. Roughness is influenced by the size and gradation of bed material, cross-section irregularities, vegetation growth, and channel alinement. Stereo photographs were taken for office review of the coefficients.

To support the choice of the roughness coefficients, streambed material was sampled from gravel bars at several points in the reaches. Results of the gradation analyses of the samples are shown in table 3 to provide supplemental information on gravel deposits on the flood plain. The samples were collected from the bed surface, where the material is subject to erosion, and probably contain less fine material than would samples excavated from deep holes. A gradation analysis of the fine material at four of the sampling points is shown in table 4.

Most of the material is well graded, and in all but one sample the maximum size was less than 16 inches. This supported our choices of roughness coefficients of 0.030 to 0.050 used in the step-backwater analysis for the main channel.

Step-Backwater Analysis

Because repeated trial-and-error calculations are required to determine water-surface profiles using the step-backwater technique, a digital computer was used. The profiles are determined by beginning at a downstream cross section with a known stage-discharge relation and progressing upstream from cross section to cross section.

To provide the initial discharges and related water-surface elevations for the analysis, profile computations were started from the gaging station at Grants Pass (fig. 1) where a stage-discharge relation is already established. Water-surface elevations were computed for each cross section, progressing upstream from the gaging station to Savage Rapids Dam. The dam creates a break in the profile. A stage-discharge relation was developed for the dam crest, and computations were continued from that point upstream to Gold Ray Dam, where another break in the profile occurs. A stage-discharge relation was then developed for the crest of Gold Ray Dam, and computations were continued upstream through the remaining part of the reach.

Table 3.--Gradation analyses of streambed samples

Sieve no.	--	--	--	--	--	--	--	--	--	5	10	18	35	60	120	200	Remarks
Size (in.)	24	16	10	6.0	4.0	2.0	1.0	0.62	0.31	0.16	0.079	0.039	0.020	0.0098	0.0049	0.0029	
	PERCENTAGE FINER																
Sampling point 1	--	--	100	99	91	68	24	17	11	8.6	7.7	5.8	2.9	0.6	0.1	0	Below freeway bridge (fig. 9).
2	--	--	100	97	91	69	39	30	22	18	15	12	7.4	2.2	.5	0.3	Below Galls Creek (fig. 10).
3	100	99	96	82	66	21	7.0	3.9	2.5	2.0	1.6	1.0	.6	.2	.05	.02	Below Gold Hill bridge (fig. 10).
4	--	--	--	100	86	74	45	28	19	15	12	6.1	3.2	1.4	.7	.6	Below Sams Creek (fig. 11).
5	--	100	99	93	82	50	32	22	15	13	9.4	7.0	3.8	1.3	.5	.4	Below Gold Ray Dam (fig. 12).
6	--	--	--	--	--	100	99	89	74	62	44	24	7.7	3.1	1.2	.5	At Bear Creek mouth (fig. 13).
7	--	--	--	100	94	71	44	28	19	11	9.2	5.7	1.4	1.1	.5	.3	Above Whetstone Creek (fig. 13).
8	--	--	--	100	97	67	28	18	12	9.2	6.4	4.8	3.1	.9	.3	.1	Above Bybee bridge (fig. 14).
9	--	--	100	99	89	60	22	17	13	7.9	3.1	1.9	.9	.4	.2	.1	Below Little Butte Creek (fig. 14).
10	--	100	99	90	79	55	29	18	13	12	11	8.4	3.7	1.0	.4	.2	Below river mile 130 (fig. 15).
11	--	--	--	100	--	68	47	32	26	24	22	18	8.9	2.5	.7	.3	Above Dry Creek (fig. 17).
12	--	--	--	--	100	89	52	32	22	18	14	8.2	4.6	1.9	.5	.3	Below Indian Creek (fig. 18).
13	--	100	92	72	53	31	21	16	11	8.6	6.7	5.9	5.0	2.3	.4	.2	Above Shady Cove bridge (fig. 18).
14	--	--	100	76	50	21	11	9.1	7.0	5.6	4.5	3.4	2.2	.9	.2	.1	Below Trail Creek (fig. 19).
15	--	100	99	86	73	34	13	9.9	6.8	4.7	2.7	1.6	1.1	.5	.2	.1	Below Elk Creek (fig. 20).
16	--	--	100	45	45	36	20	9.8	5.7	4.6	4.0	3.4	2.8	1.7	.6	.2	Near McCleod (fig. 21).
17	--	100	99	90	82	54	33	20	12	10	8.7	7.5	5.8	2.6	.9	.6	Near Lost Creek damsite (fig. 22).
18	--	100	96	80	67	43	22	14	9.8	8.2	6.1	3.8	1.6	.7	.4	.2	On Elk Creek (fig. 23).

Table 4.--Gradation analyses of fine material from selected sampling points

Size (mm)		0.074	0.062	0.031	0.016	0.008	0.004	0.002
		PERCENTAGE FINER						
Sampling point	7	100	93	55	31	24	22	19
	11	100	78	30	17	11	10	9
	16	100	57	49	44	18	13	8
	17	100	100	62	40	28	18	13

For the analysis, the following conditions were assumed:

1. The high-water profiles upstream from Savage Rapids Dam should be computed without the stoplogs on the dam crest.

2. Low-water profiles should be developed as if the stoplogs were in place.

3. Profiles on Elk Creek would be computed by starting with concordant flood elevations in the Rogue River; for example, the 20-year flood elevation on the Rogue River would be used as the initial elevation for the 20-year flood on Elk Creek.

RESULTS OF THE STUDY

The computed profiles are shown in figures 5 to 23. The profiles can be related to adjacent maps for locations of cross sections, landmarks, and streambed sampling points. The stream boundaries shown on the maps in figures 5 to 23 are for a medium flow existing at the time of aerial photography, February 13, 1969.

Elevations of the profiles for selected flows at the cross sections for the Rogue River and Elk Creek are listed in tables 5 and 6, respectively. Distances, in feet, shown in the profiles and in tables 5 and 6 were scaled from the photogrammetric work maps and checked for consistency against the river mile index for the Rogue River (Columbia Basin Inter-Agency Committee, 1967). River mileages shown on the maps (figs. 5-23) are based on the 1923 U.S. Geological Survey river-profile survey and are the same as those used in the two interim flood-plain reports (Corps of Engineers, 1965).

Table 5.--Profile elevations for the Rogue River

Station			Elevations, in feet above msl [1/]					
Report reference	Photogrammetric map reference	Distance upstream from station 1 (feet)	December 1964 flood	December 1964 flood (adjusted)	20-year flood	10-year flood	Minimum operational flow (estimated)	Thalweg
Grants Pass gage (1)	98+01	0	919.4	912.0	914.6	910.6	--	871.6
2	98+02	1,200	920.6	913.6	916.1	912.3	--	887.6
3	98+04	3,210	922.2	915.7	918.0	914.5	--	882.8
Fruitdale Creek	--	4,540	--	--	--	--	--	--
4	98+05	4,220	922.7	916.3	918.6	915.1	--	884.8
5	99+01	5,220	923.3	917.0	919.2	915.8	--	892.9
6	99+02	6,210	926.3	920.2	922.4	919.0	--	888.4
7	99+04	8,230	929.1	923.0	925.2	921.7	--	888.4
8	99+06	9,430	930.2	924.2	926.3	922.9	--	892.8
Jones Cr	--	9,470	--	--	--	--	--	--
9	99+07	10,240	930.9	925.1	927.1	923.8	--	893.0
10	100+00	11,240	932.8	926.4	928.7	925.0	--	898.0
11	100+01	12,270	934.7	928.6	930.9	927.2	--	892.6
12	100+03	14,290	936.9	931.0	933.2	929.6	--	901.1
13	101+00	15,210	940.2	933.6	936.1	932.1	--	897.1
14	101+01	15,510	940.7	934.0	936.5	932.5	--	899.1
15	101+03	16,660	942.0	935.4	937.8	934.0	--	901.2
16	101+05	18,620	943.8	937.0	939.5	935.5	--	889.2
17	101+06	19,640	945.0	938.4	940.8	937.0	--	916.7
18	102+00	20,940	945.6	940.3	942.2	939.2	--	898.7
19	102+02	22,960	956.5	948.7	951.5	947.1	--	916.8
20	102+05	24,580	959.0	951.5	954.3	950.1	--	919.4
21	102+06	25,520	960.5	954.1	956.5	952.9	--	922.6
22	103+01	27,040	962.0	956.4	958.4	955.3	--	920.5
23	103+02	28,040	965.2	959.2	961.4	958.0	--	931.5
Savage Rapids Dam	103+03	28,510	972.8	967.4	969.3	966.4	964.0	953.0
24	103+04	29,060	976.8	972.2	973.8	971.3	964.1	939.5
25	104+01	31,120	980.0	974.6	976.6	973.6	964.2	942.5
Savage Cr	--	31,490	--	--	--	--	--	--
26	104+04	34,130	982.7	977.5	979.4	976.4	964.4	948.0
Little Savage Cr	--	34,150	--	--	--	--	--	--
27	105+00	35,940	984.6	979.3	981.2	978.2	964.6	949.0
28	105+02	37,950	987.4	981.9	984.0	980.7	964.8	949.5
29	105+03	38,960	988.0	982.8	984.8	981.6	965.0	954.0
30	105+04	39,970	990.0	984.5	986.5	983.3	965.2	953.0
31	106+01	41,960	991.6	986.0	988.0	984.8	965.4	953.0
32	106+03	44,090	994.7	989.6	991.4	988.5	965.6	952.5
33	106+04	45,100	996.0	991.0	992.7	989.9	965.8	956.0
Evans Cr	--	45,780	--	--	--	--	--	--
34	107+00	46,090	997.9	992.8	994.6	991.7	966.0	957.0
35	107+01	47,090	999.0	993.8	995.5	992.6	966.2	960.5
36	107+01	47,090	999.0	993.8	995.5	992.6	966.2	960.5
Rogue River Bridge	--	47,160	--	--	--	--	--	--
37	107+02	47,510	1,000.4	994.6	996.4	993.4	966.4	962.5
Ward Creek	--	47,560	--	--	--	--	--	--
38	107+03	48,130	1,000.8	994.9	996.6	993.6	966.6	960.6

See footnote at end of table.

Table 5.--Profile elevations for the Rogue River--Continued

Station			Elevations, in feet above msl[1/]					
Report reference	Photogrammetric map reference	Distance upstream from station 1 (feet)	December 1964 flood	December 1964 flood (adjusted)	20-year flood	10-year flood	Minimum operational flow (estimated)	Thalweg
39	108+00	50,320	1,002.7	996.5	998.2	995.0	967.0	964.7
40	108+02	52,470	1,004.6	998.8	1,000.6	997.0	968.0	964.8
41	108+03	53,470	1,006.8	1,000.0	1,001.8	998.0	972.0	969.9
42	108+05	55,490	1,008.5	1,002.2	1,003.7	1,000.2	973.0	969.5
43	109+02	57,690	1,011.4	1,004.9	1,006.5	1,002.9	976.0	972.9
Birdseye Creek	--	57,690	--	--	--	--	--	--
44	109+03	58,560	1,012.6	1,006.4	1,007.9	1,004.3	979.0	977.0
Foots Cr	--	60,540	--	--	--	--	--	--
45	109+05	60,580	1,016.3	1,009.8	1,011.3	1,007.8	979.5	976.0
46	110+01	62,550	1,018.3	1,011.7	1,013.2	1,009.6	981.0	974.9
47	110+03	64,500	1,019.6	1,013.0	1,014.4	1,010.7	982.0	979.5
48	110+04	65,750	1,022.2	1,014.9	1,016.5	1,012.4	990.0	987.0
49	110+04	65,750	1,022.2	1,014.9	1,016.5	1,012.4	990.0	987.0
Freeway Br	--	66,290	--	--	--	--	--	--
50	110+05	66,830	1,022.2	1,015.0	1,016.6	1,012.6	991.0	987.9
51	111+01	68,830	1,026.5	1,018.6	1,020.2	1,016.5	993.0	989.4
52	111+02	69,840	1,028.2	1,020.2	1,021.7	1,018.2	997.0	994.9
53	111+04	71,810	1,031.5	1,023.3	1,024.8	1,021.3	999.0	996.5
54	112+00	72,920	1,033.5	1,025.4	1,026.9	1,023.3	1,000.0	985.0
55	112+01	74,020	1,035.1	1,026.4	1,028.0	1,024.2	1,001.0	999.0
56	112+03	76,030	1,037.8	1,029.0	1,030.6	1,026.8	1,002.0	993.0
57	113+00	78,050	1,042.2	1,033.4	1,035.1	1,031.2	1,007.0	1,004.7
58	113+01	79,100	1,043.2	1,034.7	1,036.3	1,032.5	1,008.0	978.7
59	113+01	79,100	1,043.2	1,034.7	1,036.3	1,032.5	1,008.0	978.7
Rock Point Bridge	--	79,180	--	--	--	--	--	--
60	113+02	79,330	1,043.7	1,035.0	1,036.8	1,032.7	1,008.5	993.1
61	113+03	80,280	1,047.0	1,038.1	1,040.0	1,035.6	1,012.0	1,009.7
62	113+04	81,280	1,048.4	1,039.8	1,041.6	1,037.6	1,013.0	1,006.0
Sardine Cr	--	82,760	--	--	--	--	--	--
63	114+00	83,290	1,052.3	1,044.1	1,045.8	1,041.9	1,020.0	1,018.0
Galls Cr	--	85,230	--	--	--	--	--	--
64	114+02	85,290	1,057.6	1,048.6	1,050.3	1,046.3	1,022.0	1,012.0
65	114+03	86,240	1,058.6	1,049.8	1,051.4	1,047.5	1,023.0	1,021.0
66	115+00	88,230	1,061.2	1,052.7	1,054.2	1,050.4	1,026.0	1,022.8
67	115+01	89,230	1,063.2	1,054.5	1,056.0	1,052.1	1,027.0	1,015.8
68	115+03	91,700	1,065.6	1,056.5	1,058.0	1,054.0	1,032.0	1,029.1
Kane Cr	--	92,070	--	--	--	--	--	--
69	115+05	92,850	1,069.0	1,059.6	1,061.2	1,057.1	1,039.0	1,024.0
70	115+06	93,110	1,070.0	1,060.2	1,061.9	1,057.7	1,040.0	1,015.0
71	115+06	93,110	1,070.0	1,060.2	1,061.9	1,057.7	1,040.0	1,015.0
Gold Hill Bridge	--	93,110	--	--	--	--	--	--
72	115+07	93,440	1,071.5	1,061.2	1,063.1	1,058.5	1,040.0	1,005.5
73	116+00	94,370	1,078.0	1,065.2	1,067.1	1,062.3	1,041.0	1,038.0
74	116+01	95,380	1,079.0	1,068.0	1,069.5	1,065.0	1,045.0	1,041.6
75	116+02	96,430	1,081.0	1,071.0	1,072.5	1,068.5	1,046.0	1,039.0
76	116+03	97,450	1,082.0	1,072.5	1,074.0	1,069.8	1,048.0	1,042.5
77	117+00	99,450	1,087.8	1,082.1	1,082.9	1,080.9	1,072.0	1,063.5

See footnote at end of table.

Table 5.--Profile elevations for the Rogue River--Continued

Station			Elevations, in feet above msl[1/]					
Report reference	Photogrammetric map reference	Distance upstream from station 1 (feet)	December 1964 flood	December 1964 flood (adjusted)	20-year flood	10-year flood	Minimum operational flow (estimated)	Thalweg
78	117+02	101,450	1,095.0	1,090.8	1,091.5	1,089.5	1,073.0	1,065.2
79	118+00	103,440	1,099.1	1,093.8	1,094.6	1,092.2	1,074.0	1,067.3
80	118+01	104,440	1,100.9	1,095.2	1,096.1	1,093.6	1,075.0	1,068.0
81	118+02	105,440	1,104.4	1,097.8	1,098.8	1,096.1	1,081.0	1,077.9
82	118+04	107,470	1,108.8	1,103.2	1,104.0	1,101.8	1,090.0	1,079.2
83	118+05	108,660	1,112.2	1,107.6	1,108.3	1,106.2	1,091.0	1,082.8
84	119+00	109,290	1,113.6	1,109.0	1,109.6	1,107.6	1,093.0	1,090.8
85	119+01	110,390	1,115.1	1,111.0	1,111.5	1,109.8	1,094.0	1,087.3
Sams Creek		110,560						
86	119+02	111,210	1,116.0	1,112.1	1,112.7	1,111.0	1,095.0	1,089.8
87	119+03	112,210	1,118.3	1,114.3	1,114.9	1,113.0	1,097.0	1,094.0
88	120+00	114,200	1,123.7	1,118.9	1,119.6	1,117.5	1,104.0	1,092.0
89	120+02	116,200	1,127.5	1,123.0	1,123.6	1,121.7	1,108.0	1,104.0
90	120+04	118,060	1,132.5	1,127.8	1,128.4	1,126.4	1,114.0	1,107.5
91	120+05	119,070	1,136.0	1,130.1	1,130.8	1,128.6	1,115.0	1,109.2
92	120+06	120,060	1,137.5	1,131.7	1,132.5	1,130.0	1,115.5	1,110.3
93	121+01	121,060	1,141.0	1,134.4	1,135.4	1,132.5	1,116.0	1,110.0
94	121+02	122,060	1,143.7	1,136.7	1,137.7	1,134.8	1,117.0	1,112.0
95	121+04	123,910	1,147.4	1,140.8	1,141.8	1,139.1	1,122.0	1,114.0
Raygold gage	--	124,240	1,145.2	1,139.0	1,139.9	1,137.4	1,122.7	--
Gold Ray Dam	--	125,010	--	--	--	--	--	--
96	122+00	125,050	1,163.0	1,157.7	1,158.5	1,156.5	1,146.5	1,146.0
97	122+01	125,520	1,166.7	1,160.6	1,161.4	1,159.0	1,147.0	1,128.0
98	122+02	126,480	1,167.1	1,160.8	1,161.7	1,159.2	1,147.0	1,134.5
99	122+04	129,020	1,167.5	1,161.2	1,162.1	1,159.7	1,148.0	1,138.0
100	122+06	130,510	1,167.7	1,161.7	1,162.5	1,160.2	1,149.0	1,138.0
Bear Creek	--	130,600	--	--	--	--	--	--
101	123+00	133,420	1,168.3	1,162.5	1,163.4	1,161.5	1,150.0	1,143.0
102	123+02	135,550	1,168.8	1,163.1	1,164.2	1,162.5	1,150.5	1,147.0
103	124+00	137,630	1,169.6	1,164.2	1,165.6	1,164.0	1,151.0	1,145.0
Whetstone Creek	--	138,920	--	--	--	--	--	--
104	124+01	139,220	1,170.4	1,165.5	1,166.9	1,165.6	1,154.0	1,151.7
Snider Cr	--	140,470	--	--	--	--	--	--
105	124+04	142,360	1,174.0	1,170.8	1,172.3	1,171.4	1,159.0	1,157.4
106	125+00	143,370	1,177.2	1,173.4	1,175.3	1,174.0	1,161.5	1,156.0
107	125+01	144,000	1,180.5	1,176.7	1,178.5	1,177.3	1,164.0	1,161.0
108	125+02	145,410	1,181.5	1,177.8	1,179.5	1,178.3	1,166.0	1,163.0
109	126+00	147,400	1,184.0	1,180.1	1,182.0	1,180.7	1,167.0	1,157.0
110	126+01	148,410	1,187.0	1,181.8	1,184.1	1,182.5	1,170.0	1,169.0
111	126+02	149,420	1,189.0	1,183.8	1,186.1	1,184.5	1,171.0	1,168.0
112	126+04	151,440	1,194.2	1,187.9	1,191.0	1,188.8	1,174.0	1,173.0
113	127+00	152,430	1,194.5	1,188.5	1,191.5	1,189.4	1,177.0	1,176.0
114	127+02	154,000	1,198.3	1,193.0	1,195.8	1,194.0	1,178.0	1,173.0
115	127+02	154,000	1,198.3	1,193.0	1,195.8	1,194.0	1,178.0	1,173.0
Bybee Bridge	--	150,400	--	--	--	--	--	--
116	127+03	154,560	1,199.6	1,194.8	1,197.3	1,195.7	1,180.0	1,178.0
117	127+05	156,440	1,201.5	1,196.5	1,199.0	1,197.3	1,183.0	1,180.0

See footnote at end of table.

Table 5.--Profile elevations for the Rogue River--Continued

Station			Elevations, in feet above msl					
Report reference	Photogrammetric map reference	Distance upstream from station 1 (feet)	December 1964 flood	December 1964 flood (adjusted)	20-year flood	10-year flood	Minimum operational flow (estimated)	Thalweg
118	128+01	158,550	1,206.3	1,201.2	1,203.5	1,201.9	1,190.0	1,188.0
119	128+02	159,550	1,208.5	1,204.1	1,206.1	1,204.8	1,195.0	1,194.0
Little Butte Cr	--	159,800	--	--	--	--	--	--
120	128+04	161,600	1,213.0	1,208.1	1,211.2	1,209.7	1,197.0	1,194.6
121	129+00	162,610	1,216.0	1,210.0	1,214.1	1,212.6	1,202.0	1,200.0
122	129+02	164,630	1,220.1	1,215.0	1,218.4	1,217.4	1,206.0	1,202.0
123	129+03	165,620	1,221.4	1,216.4	1,219.7	1,218.7	1,207.0	1,204.0
124	129+05	168,070	1,230.4	1,224.0	1,228.3	1,226.8	1,216.0	1,214.0
125	130+00	169,170	1,232.8	1,227.6	1,231.0	1,229.8	1,219.0	1,216.0
126	130+02	171,180	1,237.2	1,231.1	1,235.5	1,234.1	1,221.0	1,219.0
127	130+03	172,200	1,239.2	1,232.8	1,237.4	1,236.0	1,224.0	1,222.0
128	130+04	173,230	1,242.2	1,236.6	1,240.5	1,239.2	1,231.0	1,228.5
129	131+01	175,230	1,246.9	1,241.4	1,245.3	1,244.2	1,233.0	1,226.0
130	131+03	177,220	1,255.5	1,246.2	1,252.7	1,250.7	1,237.0	1,234.0
131	132+00	179,210	1,262.6	1,253.0	1,259.9	1,257.7	1,238.0	1,236.0
132	132+01	180,230	1,263.4	1,253.9	1,260.7	1,258.6	1,238.0	1,235.0
133	132+02	181,430	1,265.3	1,254.8	1,262.3	1,260.0	1,244.0	1,236.5
134	133+00	183,430	1,267.6	1,258.7	1,265.0	1,263.0	1,250.0	1,247.0
135	133+01	184,430	1,273.6	1,265.2	1,270.6	1,268.7	1,255.0	1,249.5
136	133+02	185,500	1,277.1	1,269.7	1,274.8	1,273.2	1,261.0	1,260.0
137	134+01	188,780	1,282.6	1,278.7	1,281.1	1,280.2	1,271.0	1,269.8
138	134+02	189,790	1,284.3	1,280.4	1,283.0	1,282.0	1,271.5	1,269.0
139	134+03	190,810	1,286.5	1,281.4	1,284.8	1,283.6	1,272.0	1,266.0
140	134+05	192,240	1,288.0	1,282.4	1,286.5	1,285.0	1,272.5	1,267.0
141	134+05	192,240	1,288.0	1,282.4	1,286.5	1,285.0	1,272.5	1,267.0
Dodge Bridge	--	192,250	--	--	--	--	--	--
Dodge Bridge gage	--	192,270	1,286.9	1,281.1	1,284.9	1,283.7	1,273.6	--
142	135+00	192,830	1,290.0	1,283.2	1,288.0	1,286.0	1,273.0	1,270.3
Reese Creek	--	194,500	--	--	--	--	--	--
143	135+02	195,190	1,296.0	--	1,293.2	1,291.7	1,281.0	1,279.0
144	135+04	197,200	1,298.4	--	1,296.6	1,295.6	1,286.0	1,285.0
145	136+00	198,210	1,301.2	--	1,300.0	1,298.9	1,288.0	1,284.0
146	136+02	200,110	1,309.0	--	1,306.5	1,305.1	1,293.0	1,289.0
147	136+04	202,120	1,314.1	--	1,311.8	1,310.0	1,298.0	1,296.5
148	137+01	204,140	1,319.5	--	1,317.1	1,315.4	1,304.0	1,301.0
149	137+02	205,130	1,323.3	--	1,321.9	1,320.3	1,305.0	1,302.0
150	137+04	207,270	1,326.3	--	1,324.5	1,323.1	1,312.0	1,309.4
151	138+00	209,300	1,328.8	--	1,327.1	1,325.8	1,314.0	1,312.0
152	138+02	211,290	1,335.0	--	1,333.0	1,331.5	1,321.0	1,317.7
153	138+04	213,490	1,342.5	--	1,340.3	1,338.7	1,327.0	1,323.7
154	139+00	215,370	1,344.9	--	1,342.8	1,341.5	1,332.0	1,328.5
155	139+01	216,380	1,348.5	--	1,346.6	1,345.3	1,333.0	1,328.0
156	139+03	218,390	1,352.8	--	1,350.7	1,349.3	1,339.0	1,336.0
157	140+01	220,410	1,356.5	--	1,354.4	1,352.9	1,342.0	1,338.5
158	140+03	222,390	1,365.0	--	1,362.5	1,360.6	1,346.0	1,344.0
159	140+05	224,420	1,369.9	--	1,368.1	1,366.8	1,355.0	1,353.0
160	141+00	226,420	1,377.0	--	1,374.5	1,372.9	1,360.0	1,358.0
161	141+02	228,420	1,382.5	--	1,379.7	1,377.7	1,364.0	1,361.5

Table 5.--Profile elevations for the Rogue River--Continued

Station			Elevations, in feet above msl[1/]					
Report reference	Photogrammetric map reference	Distance upstream from station 1 (feet)	December 1964 flood	December 1964 flood (adjusted)	20-year flood	10-year flood	Minimum operational flow (estimated)	Thalweg
162	141+03	229,420	1,385.1	--	1,382.3	1,380.5	1,369.0	1,367.0
163	142+00	231,420	1,391.3	--	1,388.7	1,387.1	1,373.0	1,371.5
Indian Cr	--	232,120	--	--	--	--	--	--
164	142+01	232,720	1,394.4	--	1,391.9	1,390.1	1,374.0	1,373.0
165	142+01	232,720	1,394.4	--	1,391.9	1,390.1	1,374.0	1,373.0
Shady Cove Bridge	--	232,800	--	--	--	--	--	--
166	142+03	233,500	1,400.2	--	1,396.6	1,393.7	1,374.0	1,368.8
167	142+04	234,510	1,402.0	--	1,397.3	1,394.4	1,377.0	1,374.0
168	142+06	236,500	1,405.4	--	1,400.9	1,398.0	1,379.0	1,377.0
169	143+02	238,510	1,407.9	--	1,403.6	1,400.7	1,382.0	1,375.8
170	143+03	239,540	1,411.2	--	1,406.8	1,403.9	1,390.0	1,385.0
171	144+00	241,540	1,417.3	--	1,413.4	1,411.1	1,392.0	1,388.0
172	144+02	243,570	1,422.0	--	1,417.0	1,414.6	1,394.0	1,390.0
173	144+04	245,550	1,424.0	--	1,419.2	1,416.8	1,400.0	1,397.0
Trail Cr	--	246,370	--	--	--	--	--	--
174	145+00	246,590	1,426.0	--	1,421.0	1,418.3	1,401.0	1,398.0
175	145+02	248,610	1,428.0	--	1,423.3	1,421.1	1,406.0	1,403.5
176	145+04	250,610	1,435.0	--	1,429.5	1,427.1	1,413.0	1,407.0
177	146+01	252,620	1,442.9	--	1,438.7	1,436.2	1,421.0	1,417.0
178	146+02	253,640	1,445.4	--	1,441.5	1,439.3	1,426.0	1,420.0
179	146+04	255,670	1,452.6	--	1,449.4	1,447.2	1,434.0	1,429.0
180	147+01	257,700	1,458.7	--	1,456.0	1,453.8	1,440.0	1,437.0
181	147+03	259,700	1,462.7	--	1,459.2	1,456.9	1,441.0	1,438.0
182	147+05	261,700	1,467.0	--	1,462.7	1,460.0	1,445.0	1,442.0
Elk Creek	--	263,380	1,470.5	--	--	--	--	--
183	148+01	263,720	1,471.0	--	1,466.9	1,464.0	1,451.0	1,448.7
184	148+02	264,720	1,472.6	--	1,468.8	1,466.0	1,454.0	1,452.0
185	148+04	266,710	1,478.9	--	1,474.6	1,472.3	1,461.0	1,456.0
186	148+05	267,720	1,483.0	--	1,478.9	1,476.6	1,465.0	1,460.0
187	149+01	269,750	1,495.3	--	1,490.2	1,487.5	1,476.0	1,469.0
188	149+03	271,840	1,500.7	--	1,496.7	1,494.4	1,482.0	1,475.5
189	150+00	273,160	1,504.0	--	1,500.3	1,498.0	1,486.0	1,482.0
McLeod gage	--	274,800	1,509.4	--	1,505.0	1,502.7	1,490.4	--
190	150+02	275,170	1,509.0	--	1,505.0	1,503.0	1,490.5	1,485.0
191	150+04	277,200	1,516.0	--	1,511.0	1,508.0	1,498.0	1,494.0
192	151+01	279,220	1,523.6	--	1,519.2	1,516.7	1,508.0	1,502.0
193	151+02	280,200	1,526.7	--	1,522.6	1,520.5	1,513.0	1,510.0
194	151+04	282,240	1,535.2	--	1,531.8	1,530.1	1,518.0	1,515.4
Big Butte Creek	--	282,290	--	--	--	--	--	--
195	151+05	283,250	1,539.0	--	1,535.0	1,533.0	1,520.0	1,515.0
196	152+01	285,300	1,542.9	--	1,540.1	1,537.9	1,528.0	1,525.0
197	152+02	286,330	1,544.8	--	1,543.1	1,541.7	1,534.0	1,531.0
198	152+03	287,350	1,547.6	--	1,546.4	1,545.0	1,535.0	1,530.5
199	152+05	289,350	1,557.8	--	1,555.4	1,553.4	1,545.0	1,540.0
200	153+00	289,740	1,559.2	--	1,557.0	1,555.0	1,545.0	1,540.0
201	153+00	289,740	1,559.2	--	1,557.0	1,555.0	1,545.0	1,540.0
202	153+01	290,360	1,561.8	--	1,559.3	1,557.2	1,547.0	1,542.0
203	153+03	292,350	1,568.6	--	1,566.4	1,564.5	1,557.0	1,553.0

1/ Datum of 1929, adjustment of 1947.

Table 6.--Profile elevations for Elk Creek

Station			Elevations, in feet above msl[1/]			
Report reference	Photogrammetric map reference	Distance upstream from mouth (feet)	December 1964 flood	20-year flood	10-year flood	Thalweg
1	000+01	730	1,472.0	1,467.0	1,464.0	1,453.5
2	000+01	730	1,472.0	1,467.0	1,464.0	1,453.5
Highway Bridge	--	730	--	--	--	--
3	000+02	1,010	1,473.7	1,469.9	1,468.3	1,455.8
Elk Creek gage	--	1,800	1,475.4	1,472.6	1,470.8	--
4	000+03	1,980	1,475.7	1,474.2	1,473.0	1,460.8
5	000+04	3,070	1,482.9	1,480.9	1,479.4	1,465.0
Berry Creek	--	4,030	--	--	--	--
6	000+05	4,070	1,488.3	1,486.4	1,484.9	1,469.1
7	000+06	5,070	1,490.3	1,488.4	1,487.0	1,469.1
8	000+07	6,080	1,493.8	1,492.1	1,490.8	1,480.0
9	000+08	7,060	1,504.1	1,502.9	1,501.9	1,488.9
10	000+09	8,060	1,510.7	1,509.4	1,508.4	1,498.5
11	000+10	9,040	1,516.4	1,515.2	1,514.0	1,499.5
12	000+11	10,030	1,521.1	1,519.9	1,518.6	1,507.3

1/ Datum of 1929, adjustment of 1947.

Plots of the cross sections are shown in figures 24 to 44. These plots are intended primarily to show the general shape of the channel and the approximate bank-full stage at which water will spill over the main channel bank and onto the flood plain.

The computed elevations for the December 1964 flood were generally in good agreement with documented elevations, although documented elevations were usually higher than computed elevations on the outside of a bend and lower on the inside of a bend. The theory underlying the basic step-backwater technique assumes that the water surface is level across a section. Actually, moving water tends to pile up on the outside and drop on the inside of a bend. As an example, the gaging station below Gold Ray Dam (fig. 12) is located on the inside of a bend, and the elevation of the December 1964 flood at the gage was 2.2 feet lower than the computed elevation of 1,147.4 feet (table 5). Pileup of water on the opposite bank from the gaging station is evident in the picture shown in figure 3.

At the Dodge Bridge gaging station (fig. 16), the recorded elevation of the December 1964 flood was more than 1 foot lower than the computed elevation (table 5). This difference is probably caused by a drawdown of the water surface at the gage, which is just upstream from a constriction in the channel.

Inflow from large tributaries, such as from Evans, Bear, Little Butte, Trail, Elk, and Big Butte Creeks, also creates pileup of water on the side of the river where the creeks enter. This pileup was particularly evident near the mouths of Little Butte and Trail Creeks, where the December 1964 flood elevations apparently were as much as 6 feet higher than the computed elevations. These two tributary streams enter the Rogue River on the outside of a bend, which adds to the pileup.

The computed profiles are based on open-channel conditions that existed at the time of aerial photography, February 13, 1969. Channel alinement and configuration changes that might have occurred between the December 1964 flood and the date of aerial photography could have caused some differences between documented and computed water elevations.

The computed profiles do not reflect debris jamming. During the December 1964 flood, jams did occur at some locations vulnerable to catching debris. For example, the McLeod bridge was washed downstream to a bend near Casey Park (between cross sections 192 and 193, fig. 21), where the bridge and the debris caught by it created backwater in the vicinity of the park.

USE OF THE RESULTS

The computed profiles can be used to estimate elevations of the 20- and 10-year floods, the December 1964 flood, and low flow for any location in the study reaches. The profiles can also be used to estimate the elevations of the adjusted 1964 flood downstream from Dodge Bridge (figs. 5-16).

In using the results of the study, allowances should be made (1) for pileup of water on the outside of bends and near the mouths of tributary streams and (2) for backwater in areas vulnerable to catching debris. Under these conditions, water-surface elevations will probably be higher than those shown on the profiles (figs. 5-23) or listed in tables 5 and 6. It should also be recognized that in times of flooding, water running off sidehills can pond in areas isolated from and above the water surface of the main stream. Elevation of this ponded water should not be confused with the elevation indicated on the profiles.

Because the Rogue River channel alinement has shifted in the past due to flooding and will no doubt continue to shift in the future, future flood elevations could differ from those shown in this report. Development of the flood plain, which could measurably change existing channel roughness or the shape of the channel, could also change future flood elevations.

SUMMARY

Flood and low-water elevations for selected reaches of the Rogue River and Elk Creek downstream from Lost Creek and Elk Creek damsites are presented in tables and graphical profiles. The data show that elevations for a flood on the Rogue River equivalent to that of December 1964, but reduced by storage in the proposed reservoirs, would fall between a 10- and 20-year flood downstream from Whetstone Creek. Upstream from Whetstone Creek the adjusted December 1964 flood would be lower than a 10-year flood. The computed water-surface profiles are generally in good agreement with the documented flood elevations.

REFERENCES

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Columbia Basin Inter-Agency Committee, 1967, River mile index, Rogue River: Hydrology Subcommittee rept., Portland, Oreg., 28 p.

U.S. Army Corps of Engineers, 1965, Flood plain information, Jackson County, Oregon, interim report: 33 p.

_____1965, Flood plain information, Josephine County, Oregon, interim report: 26 p.

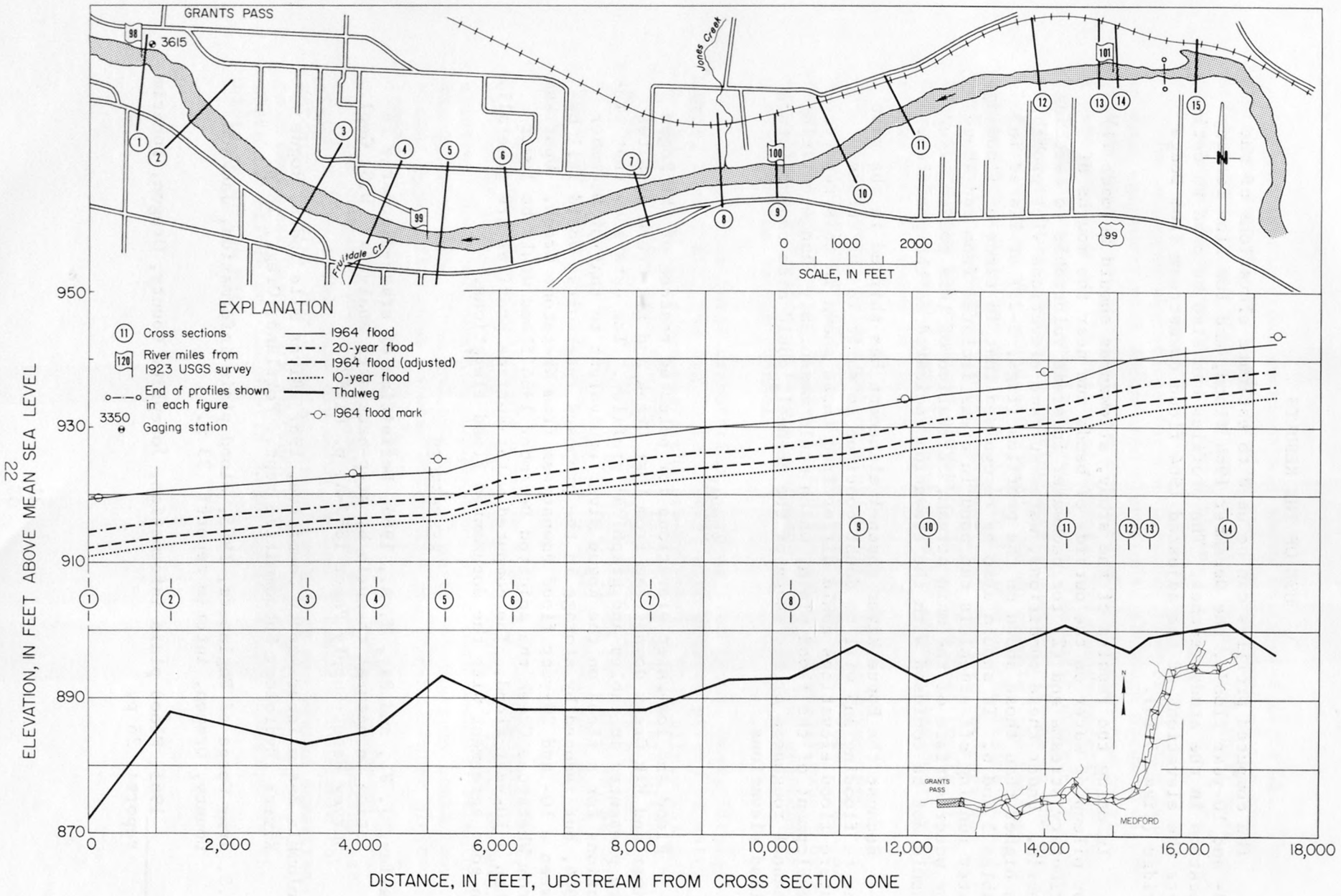

FIGURE 5.-- Profiles of Rogue River

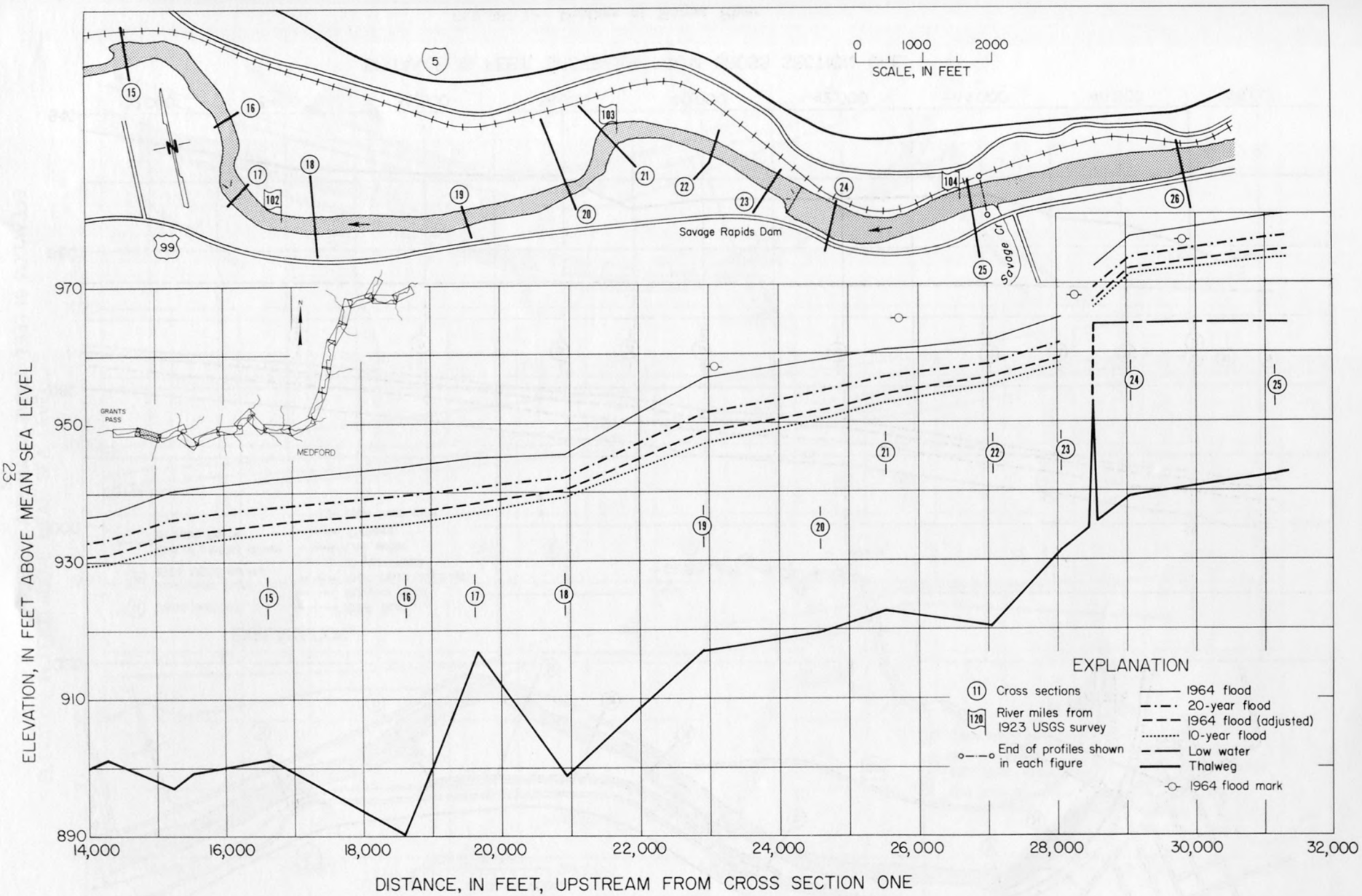

FIGURE 6.-- Profiles of Rogue River

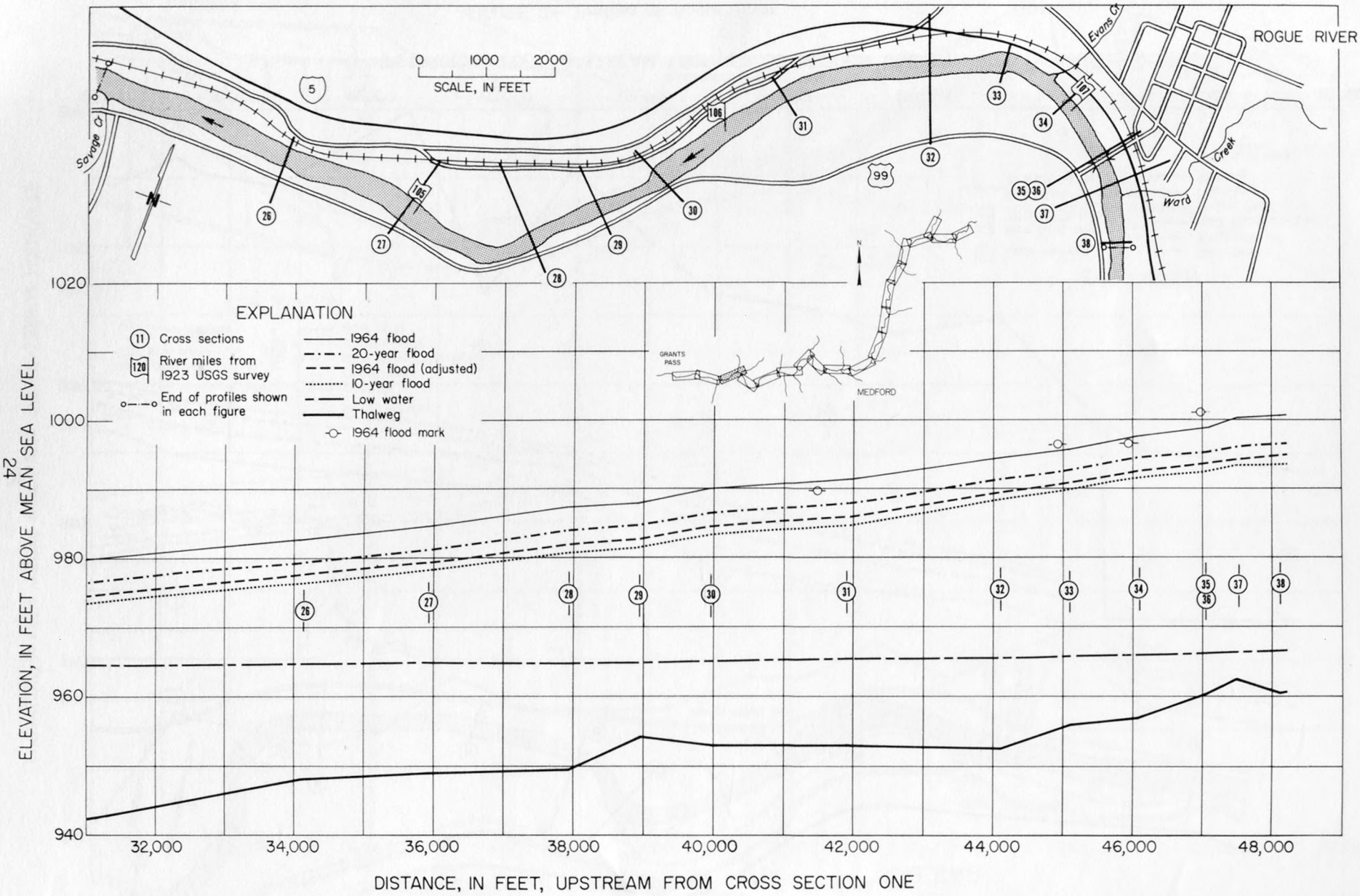

FIGURE 7-- Profiles of Rogue River

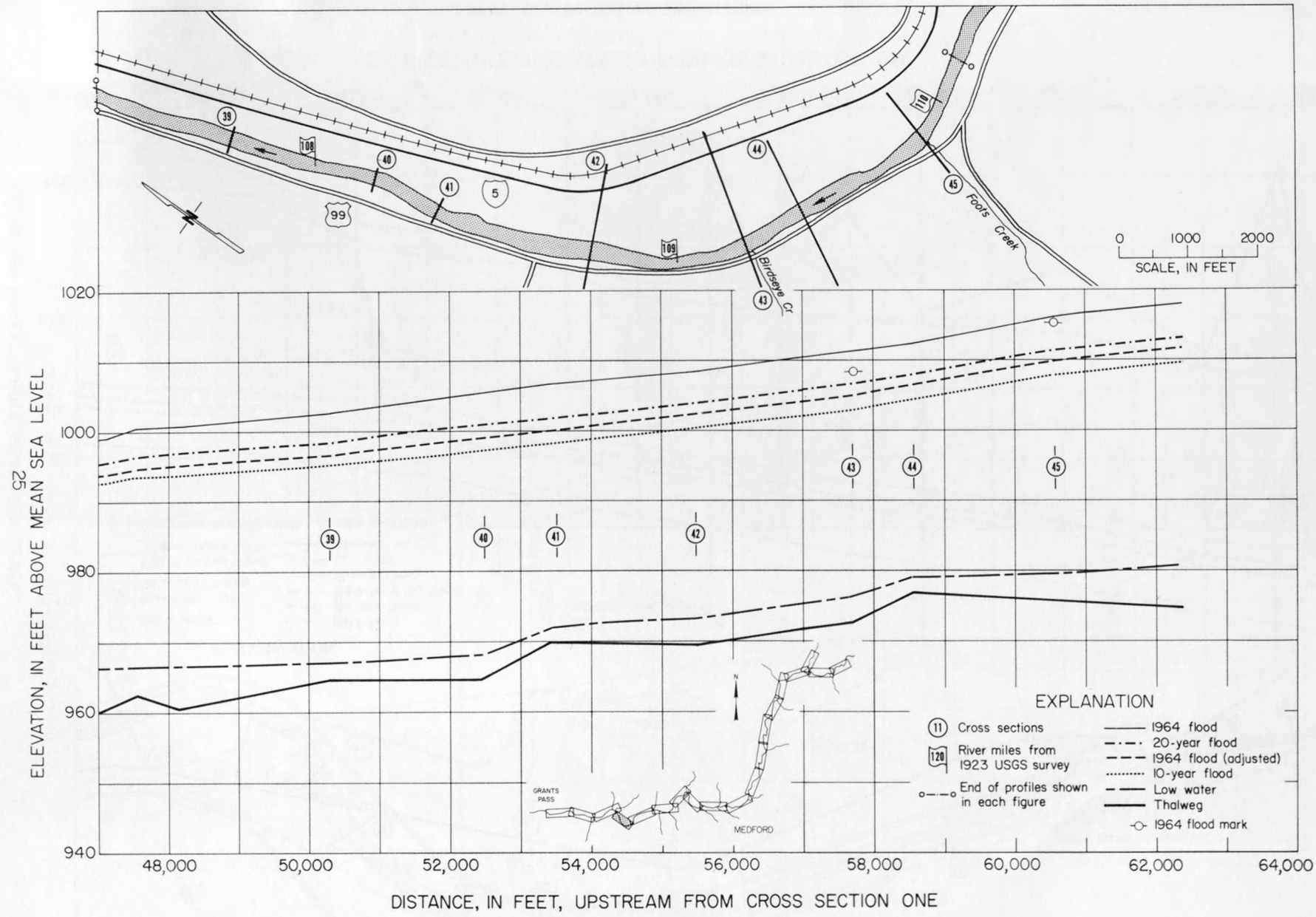

FIGURE 8.-- Profiles of Rogue River

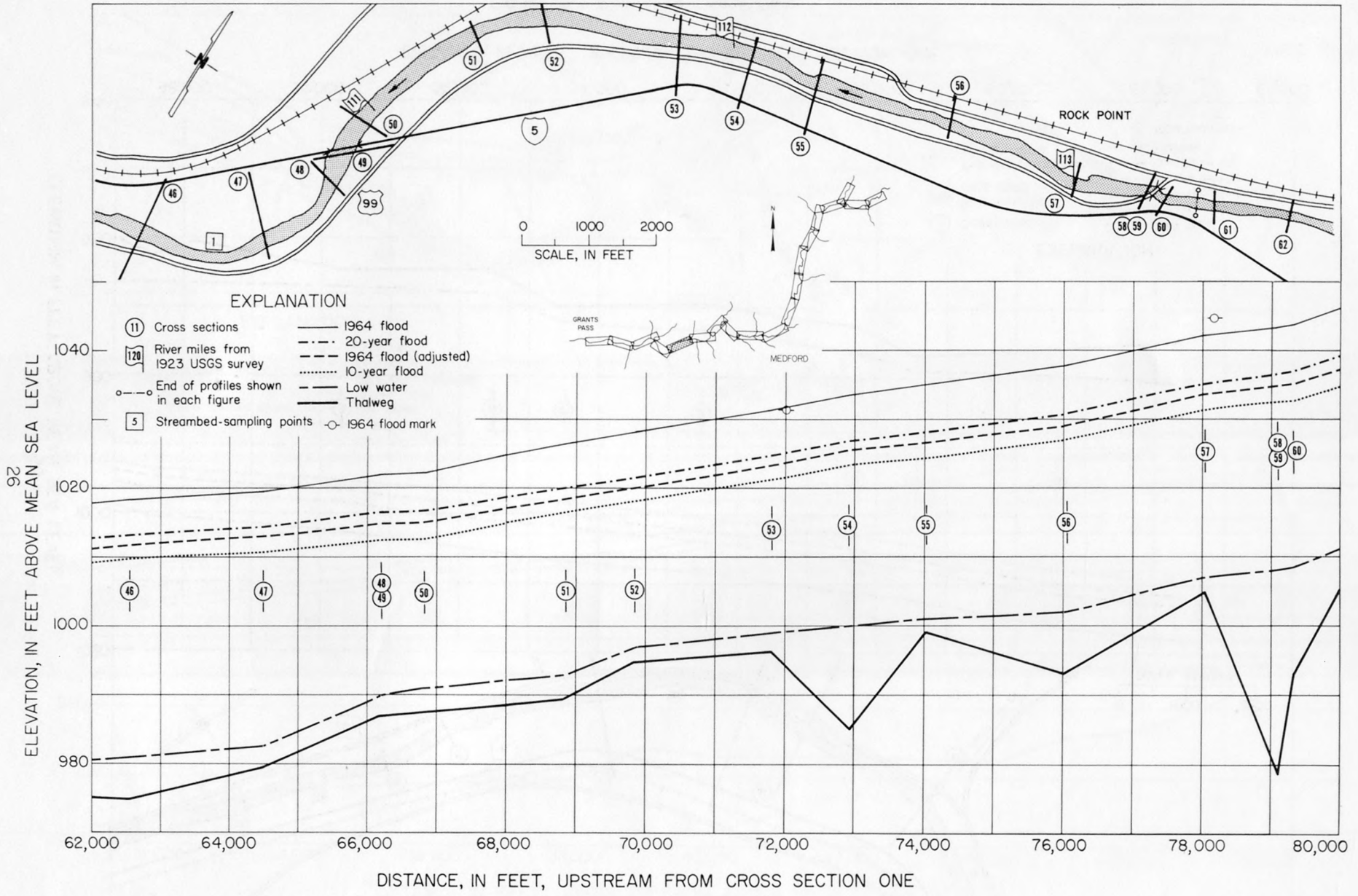

FIGURE 9.-- Profiles of Rogue River

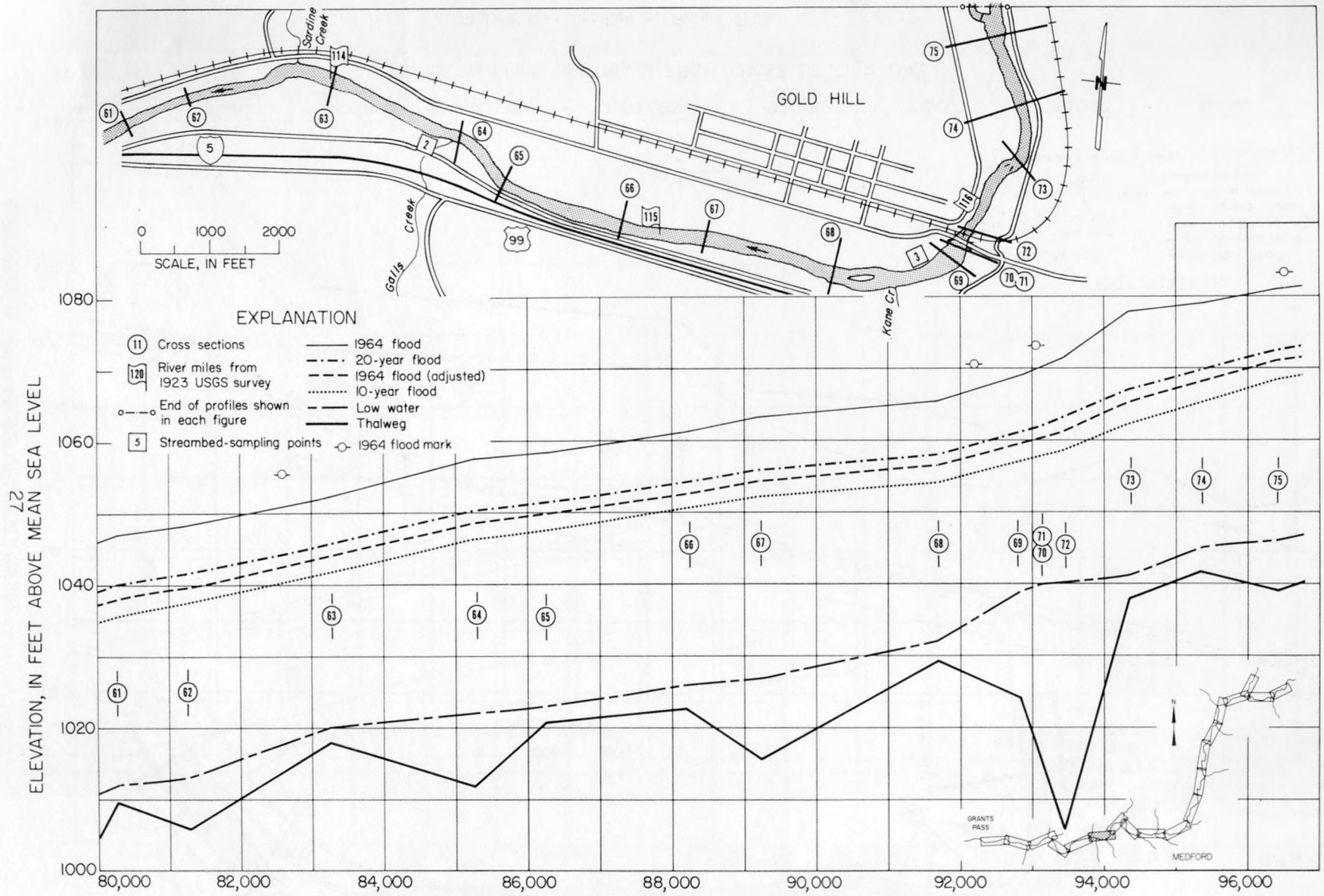

FIGURE 10.-- Profiles of Rogue River

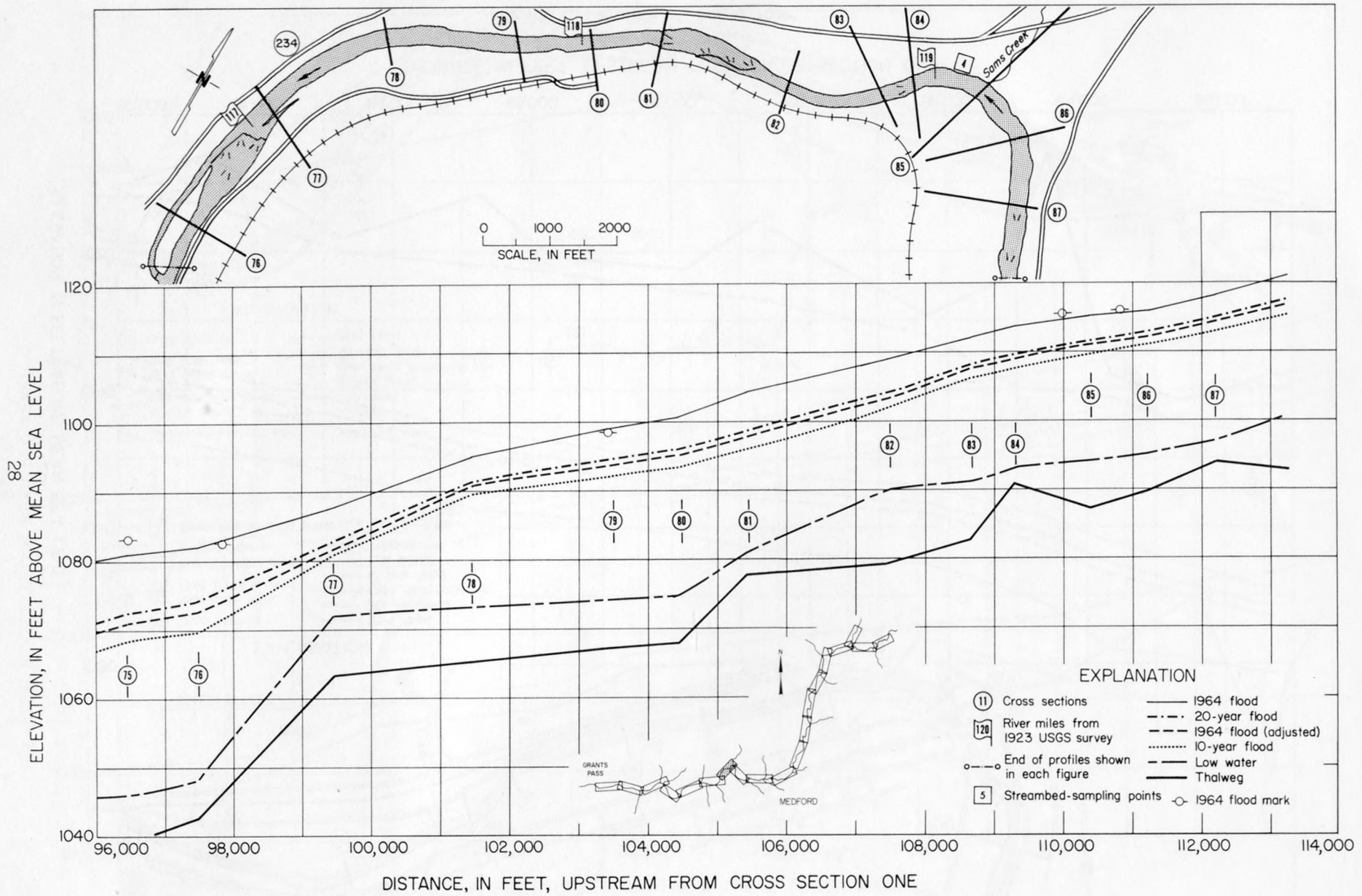

FIGURE 11.-- Profiles of Rogue River

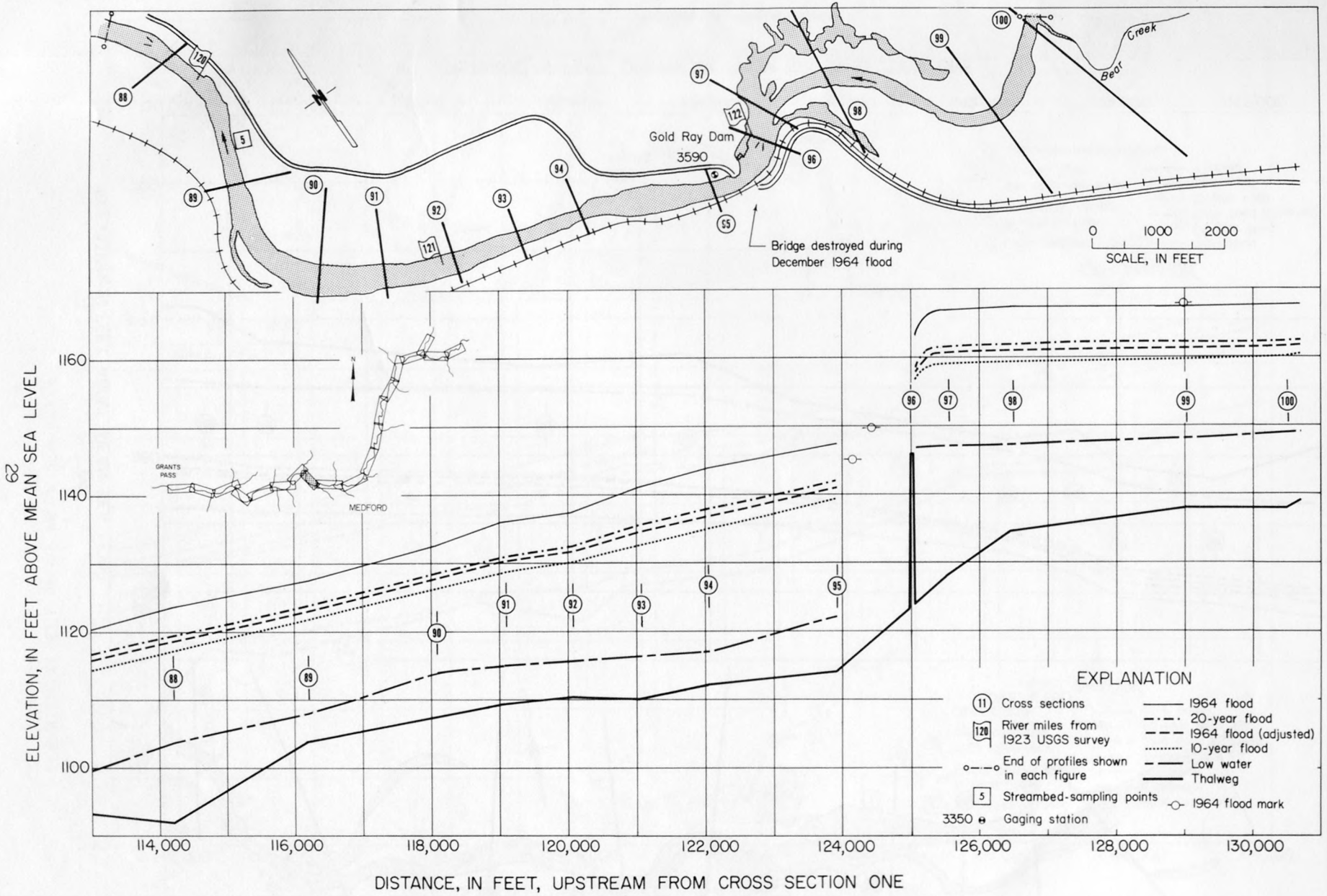

FIGURE 12.-- Profiles of Rogue River

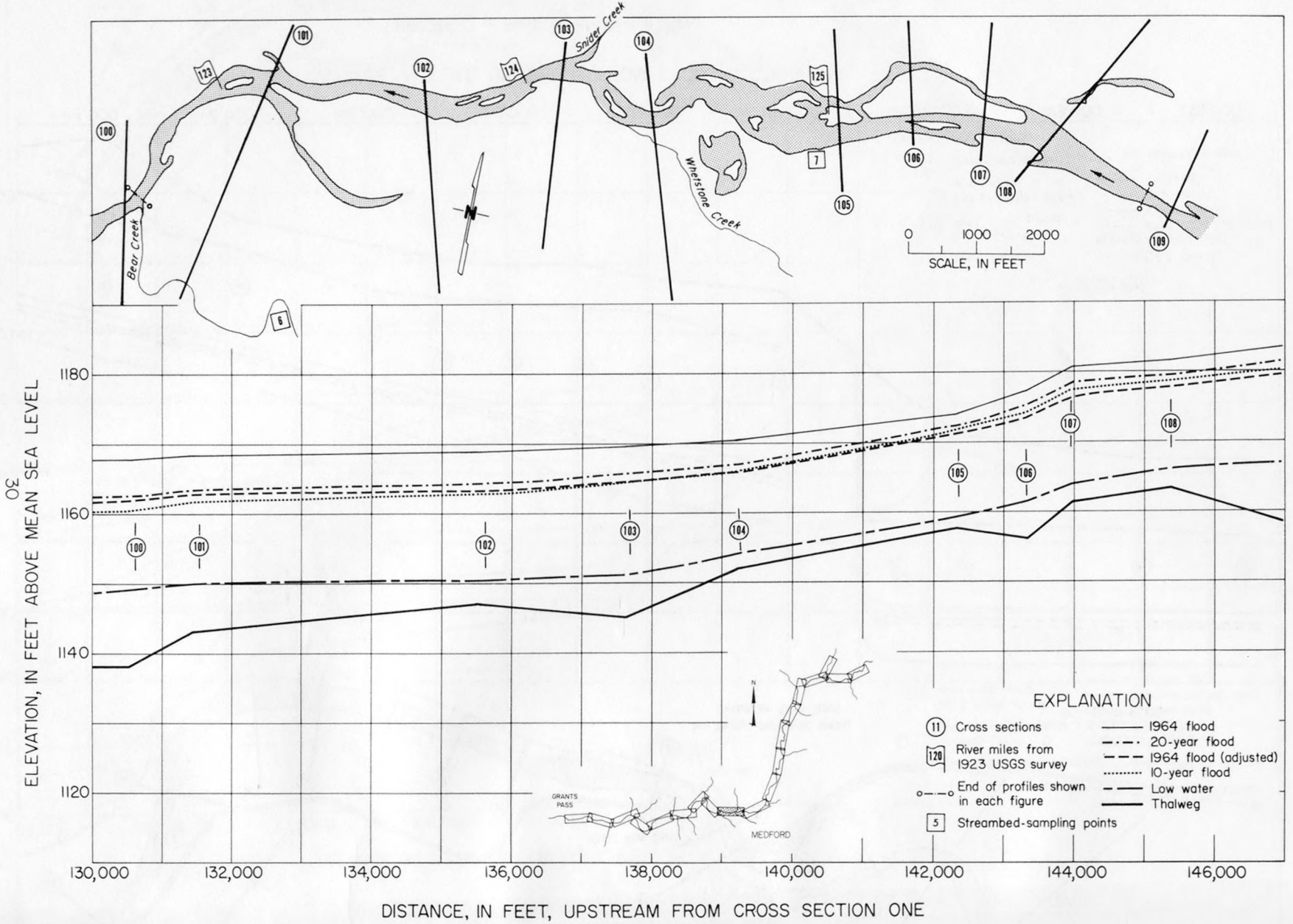

FIGURE 13.-- Profiles of Rogue River

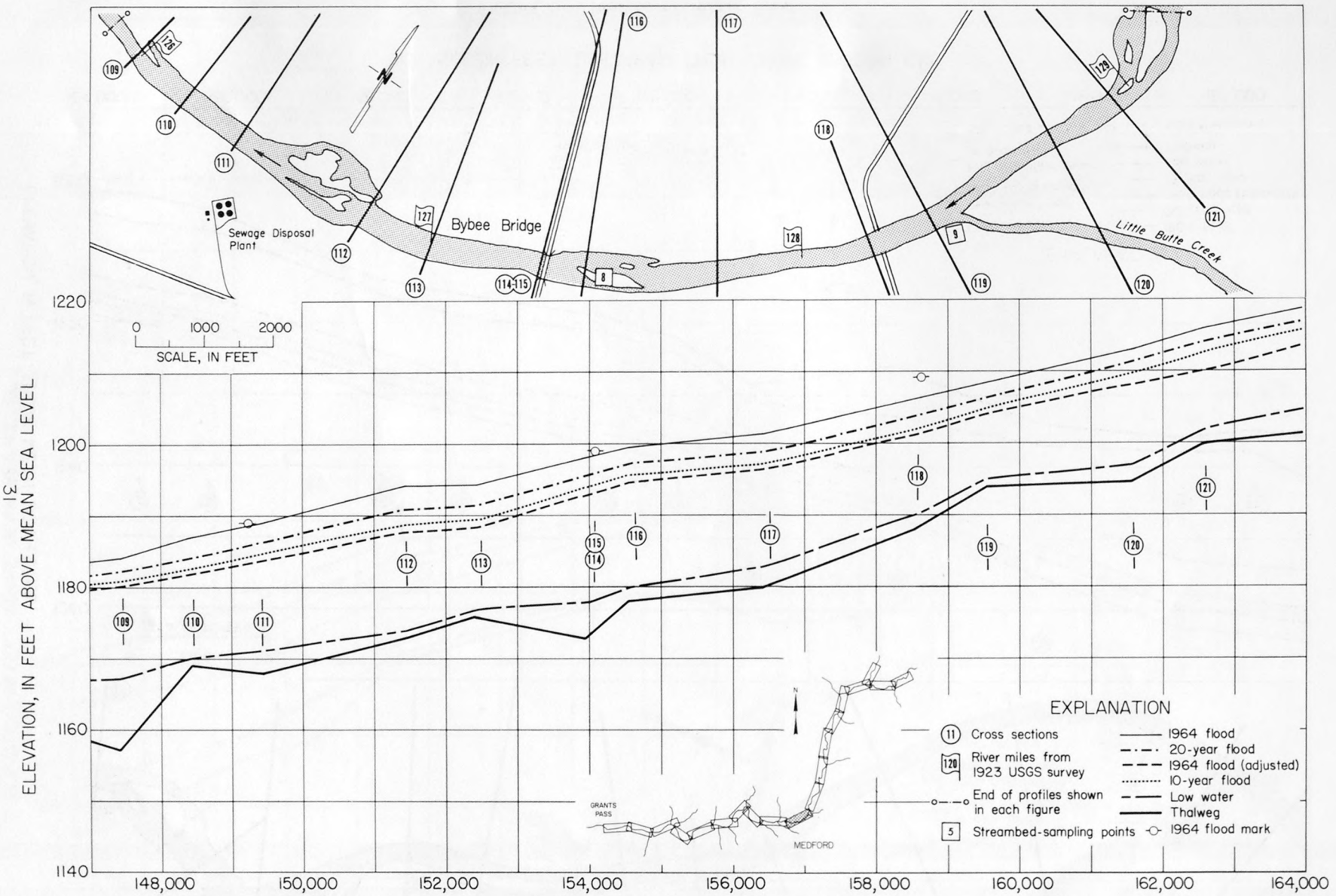

FIGURE 14.-- Profiles of Rogue River

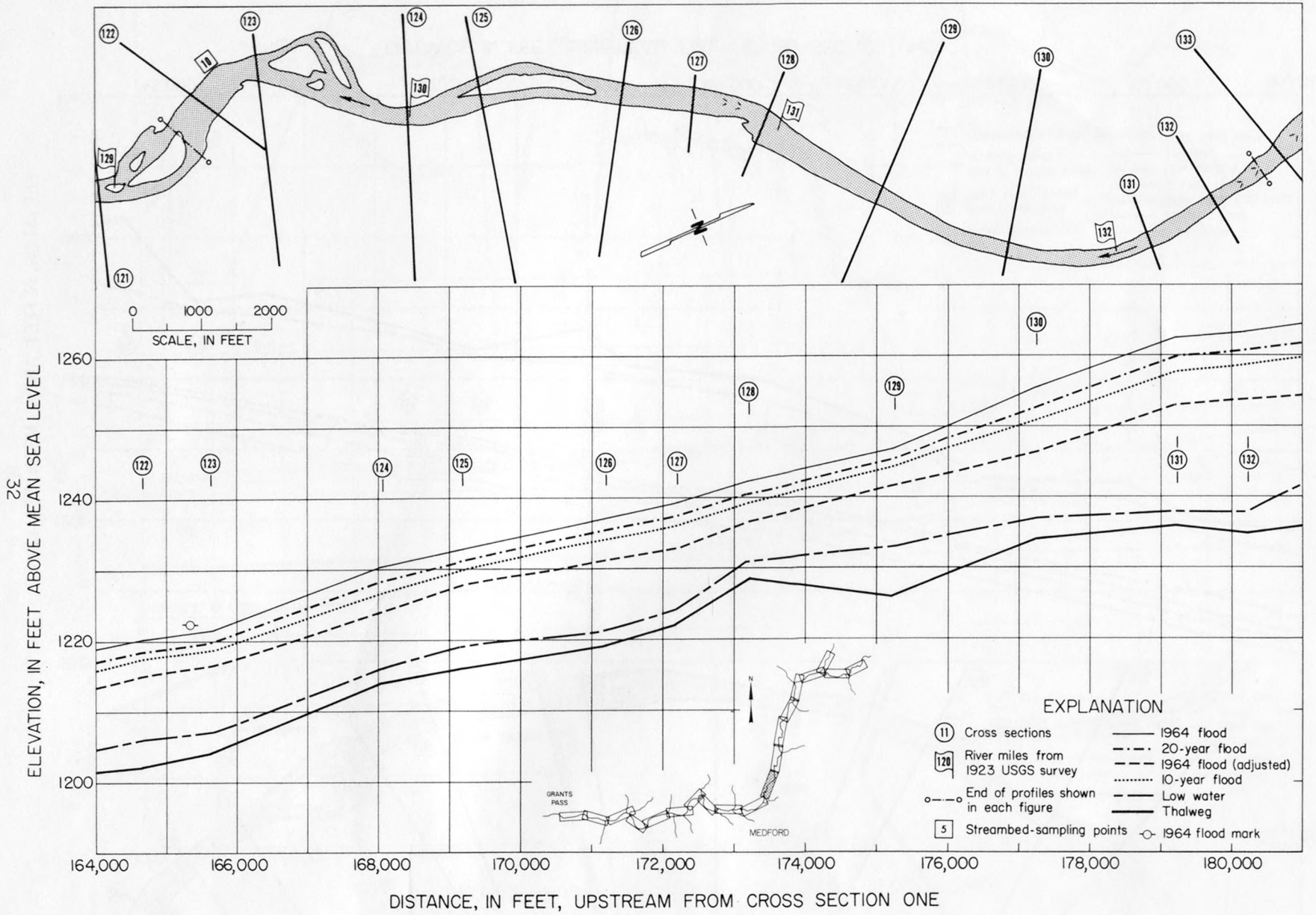

FIGURE 15.-- Profiles of Rogue River

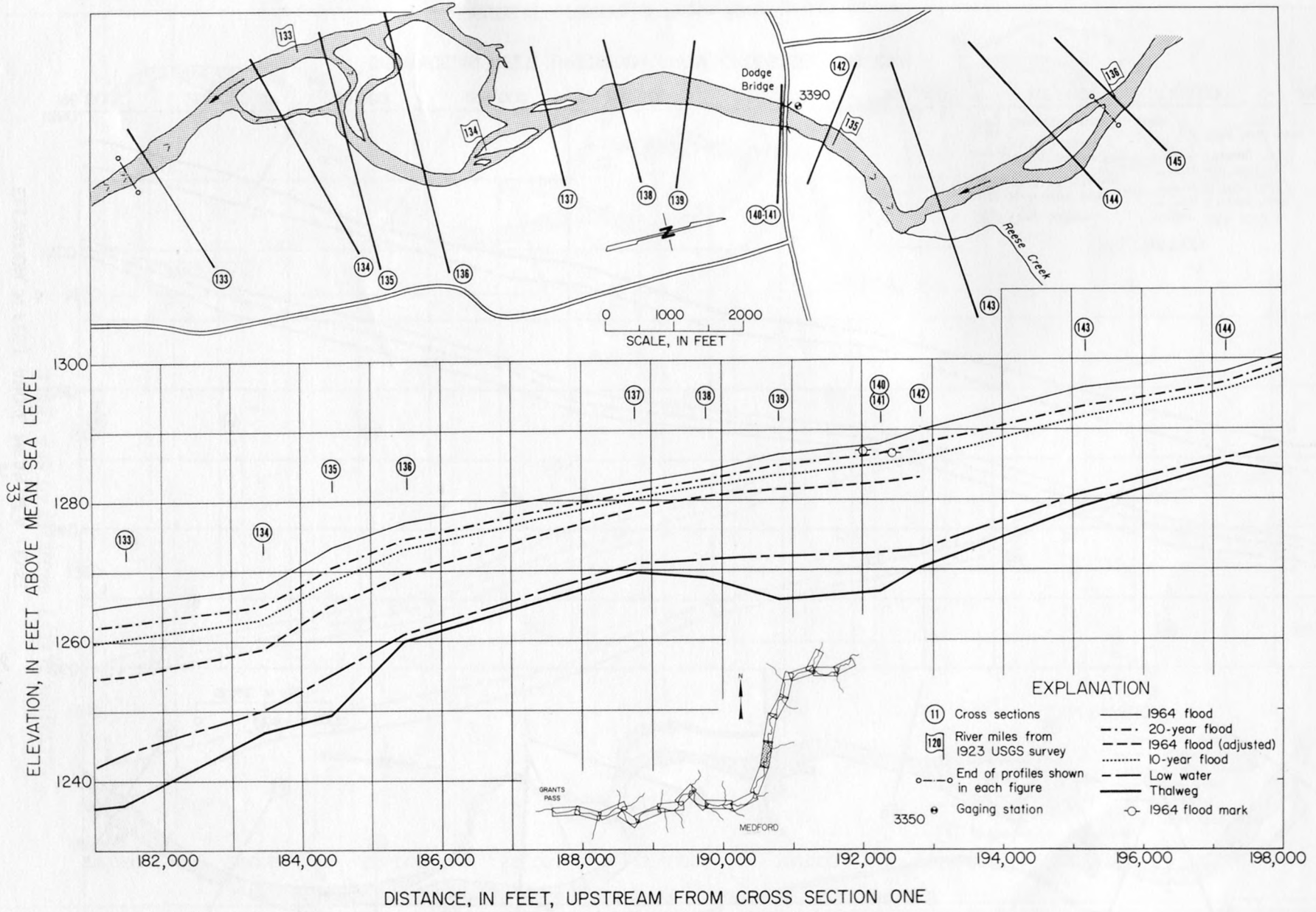

FIGURE 16.-- Profiles of Rogue River

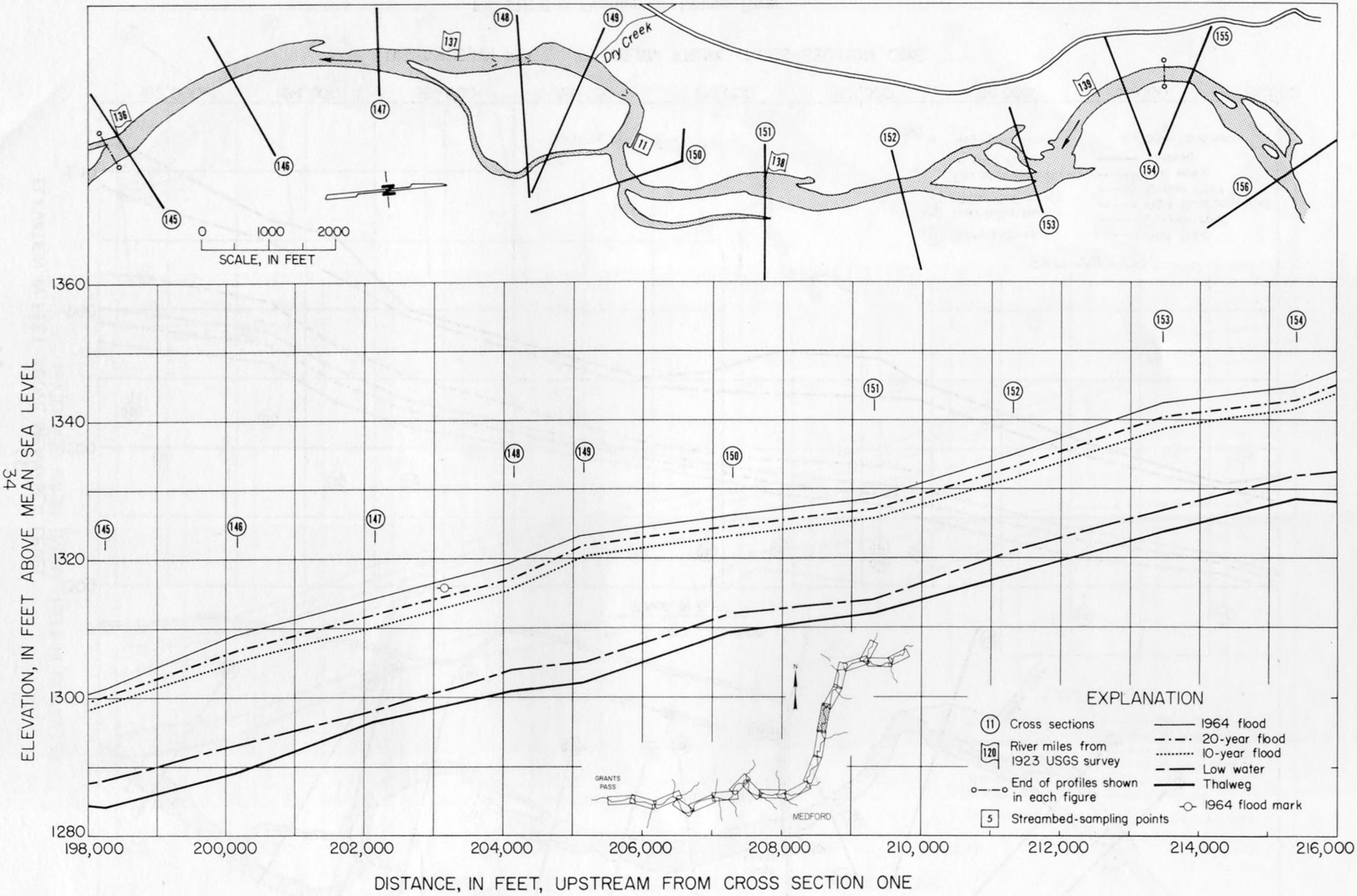

FIGURE 17.-- Profiles of Rogue River

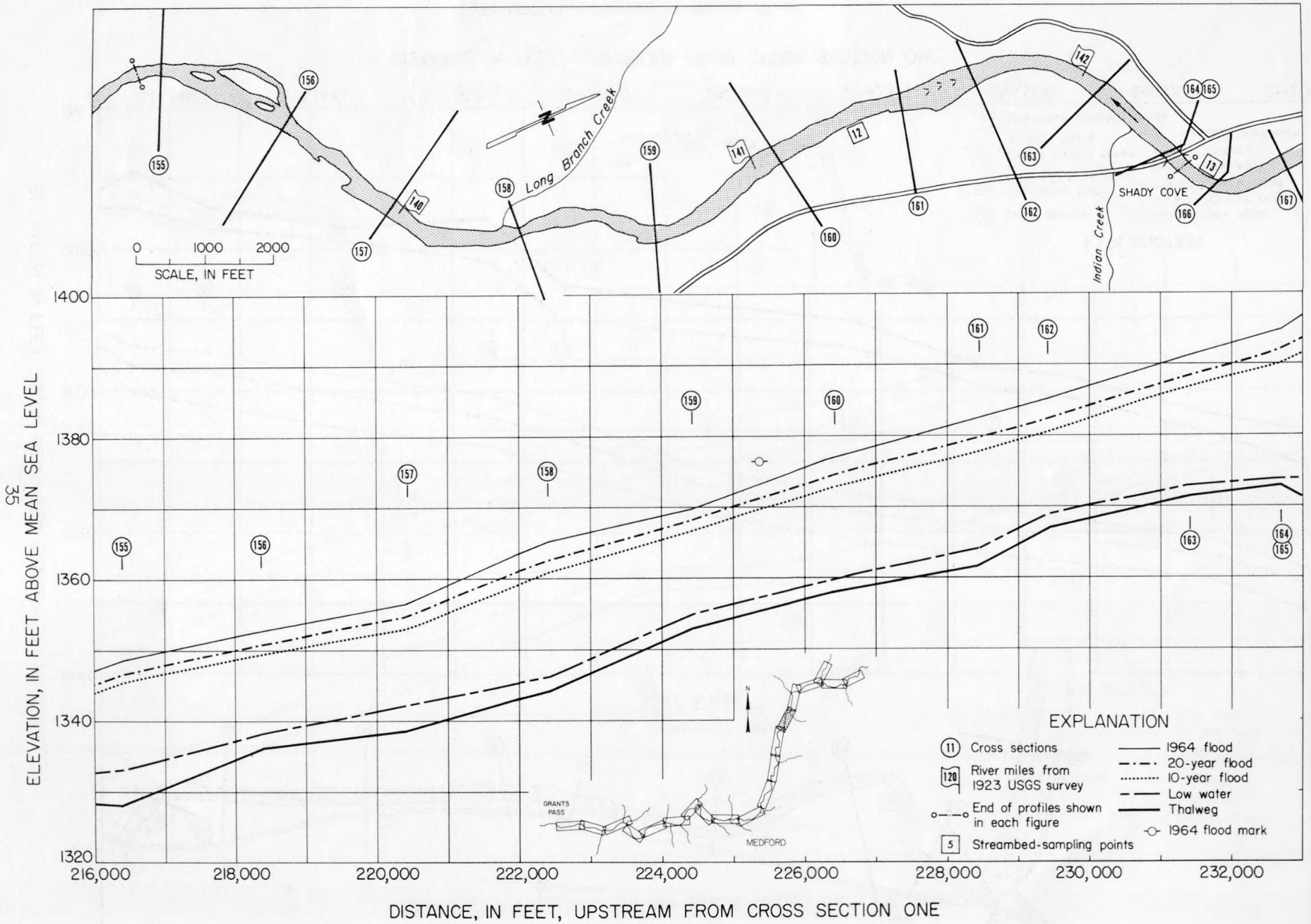

FIGURE 18.-- Profiles of Rogue River

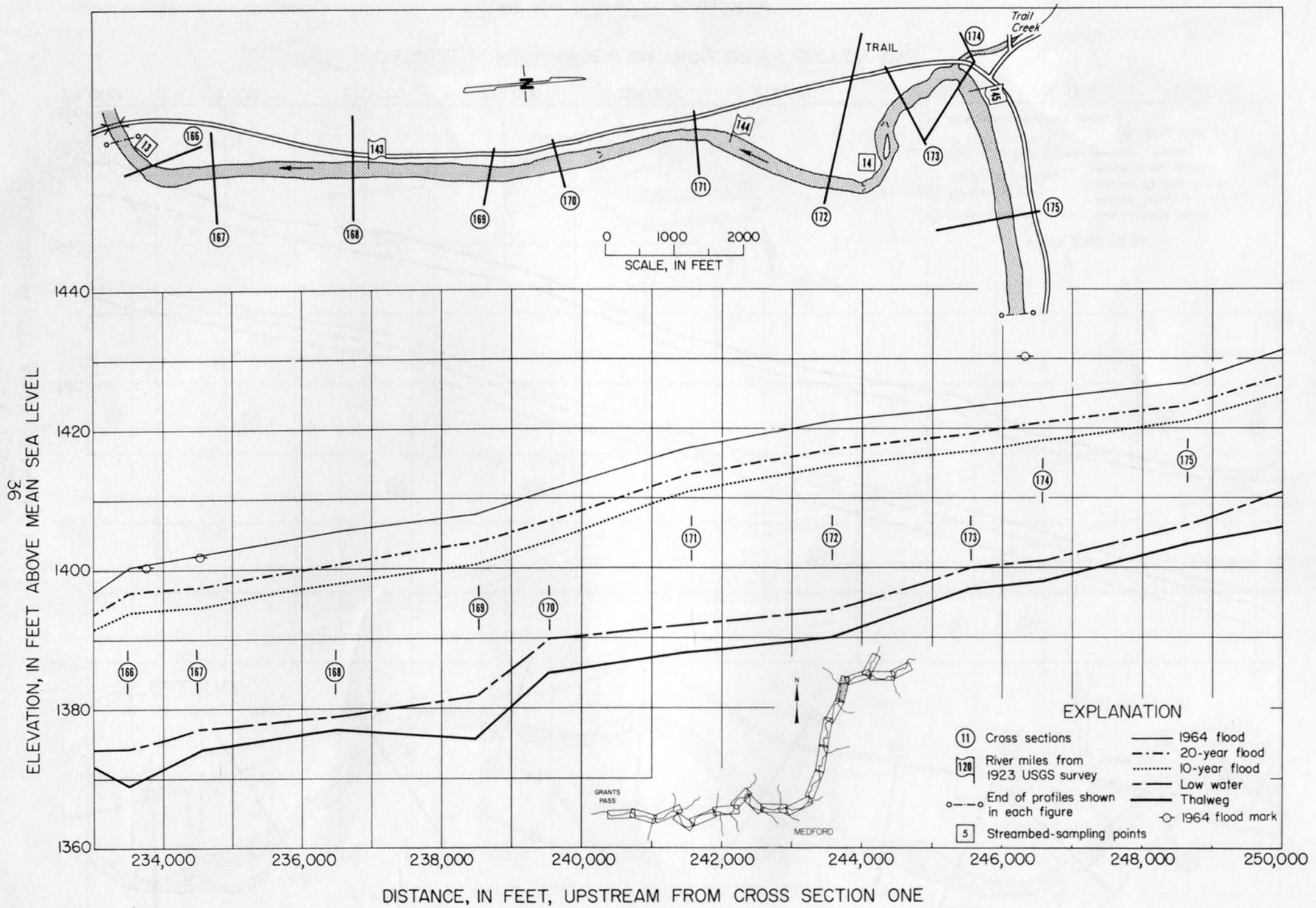

FIGURE 19.-- Profiles of Rogue River

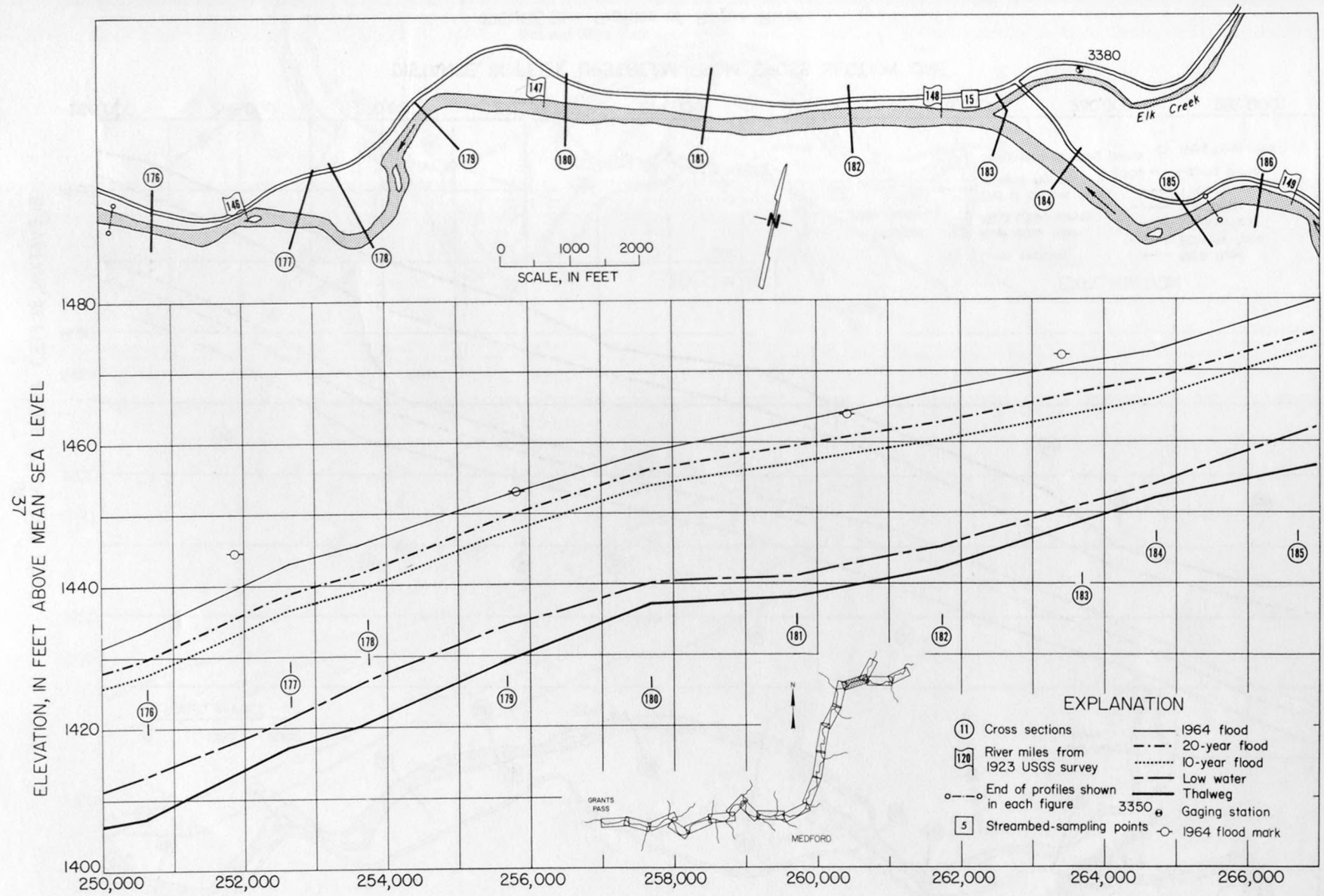

FIGURE 20.--Profiles of Rogue River

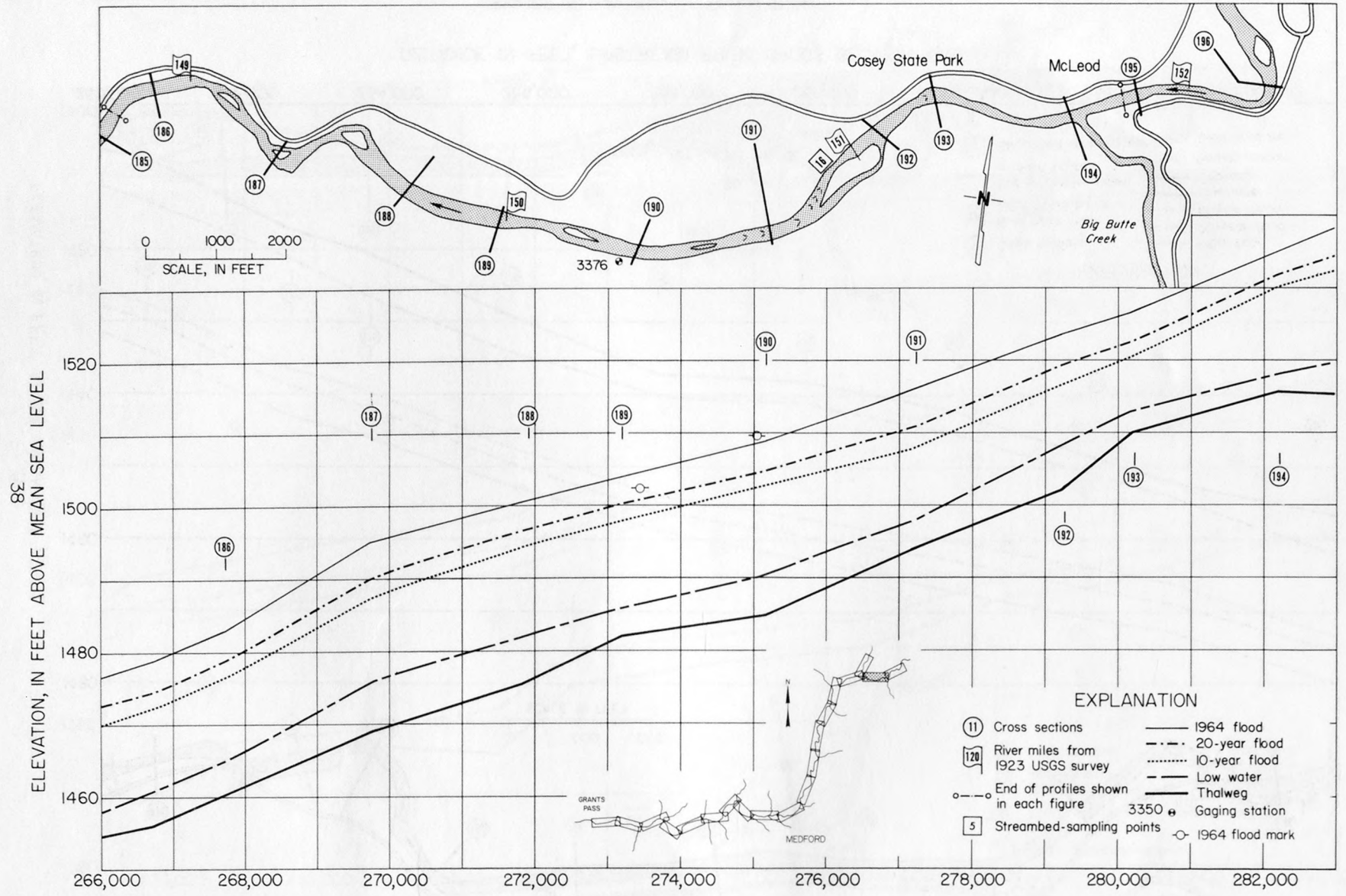

FIGURE 21.-- Profiles of Rogue River

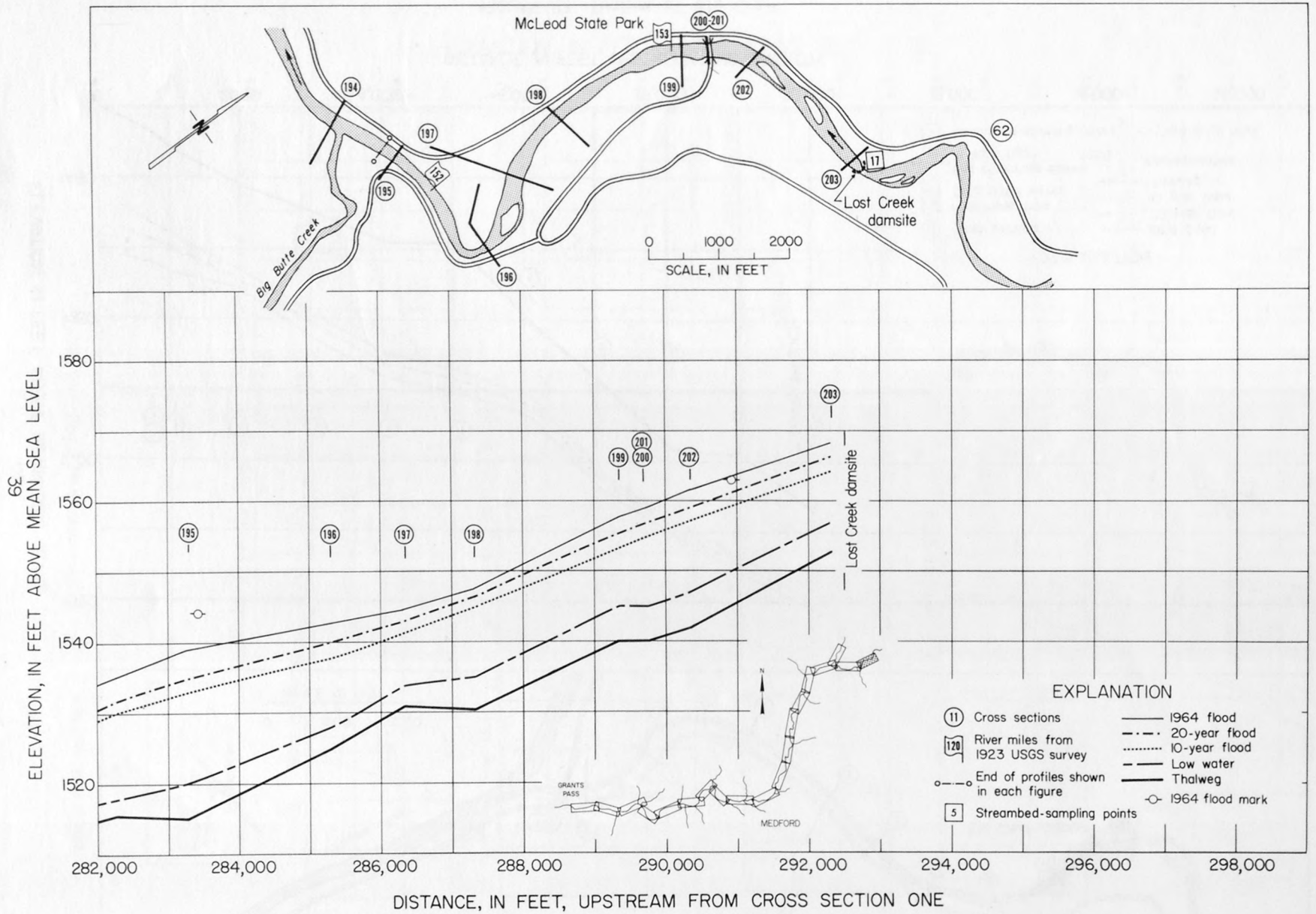

FIGURE 22.-- Profiles of Rogue River

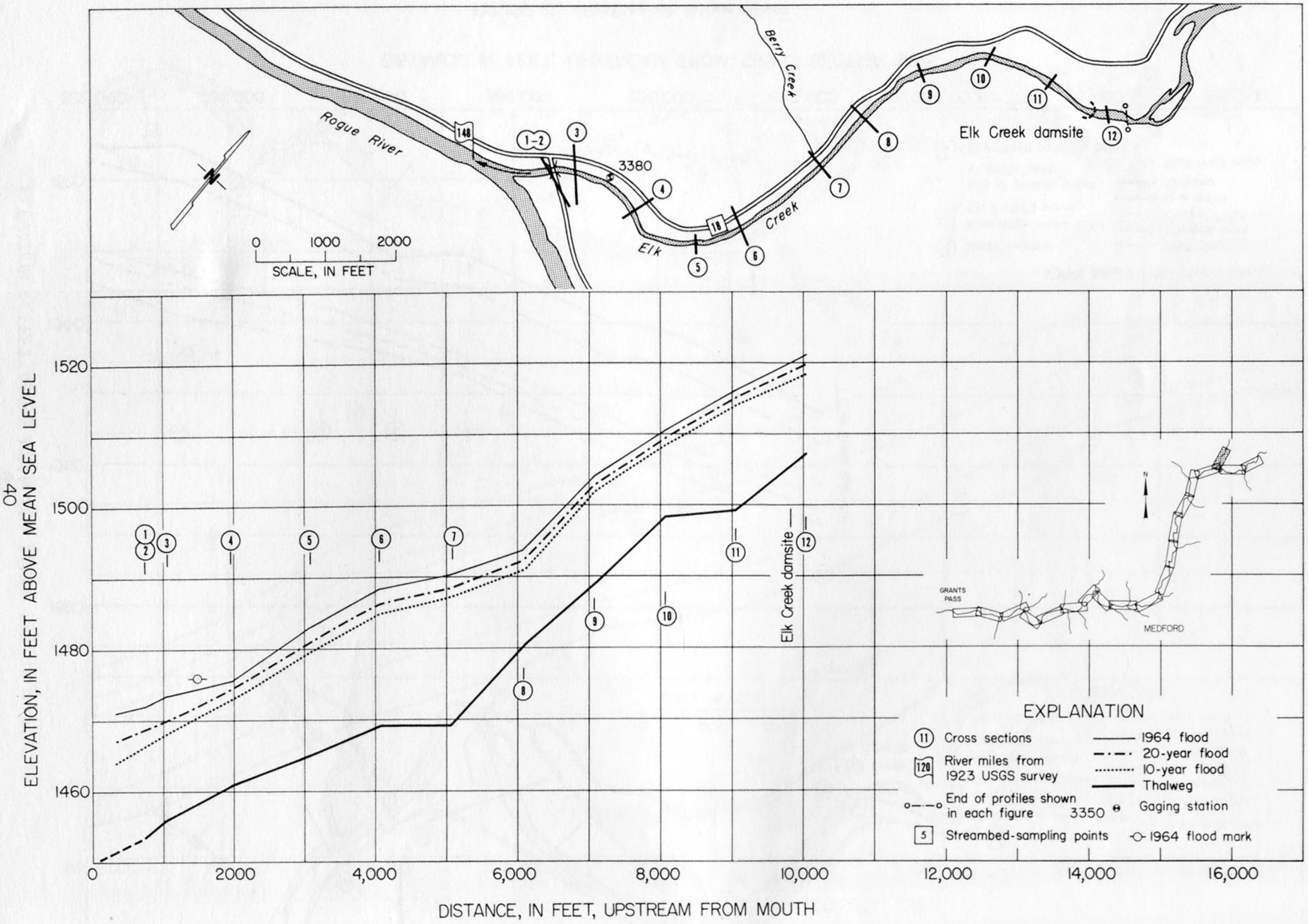

FIGURE 23-- Profiles of Elk Creek

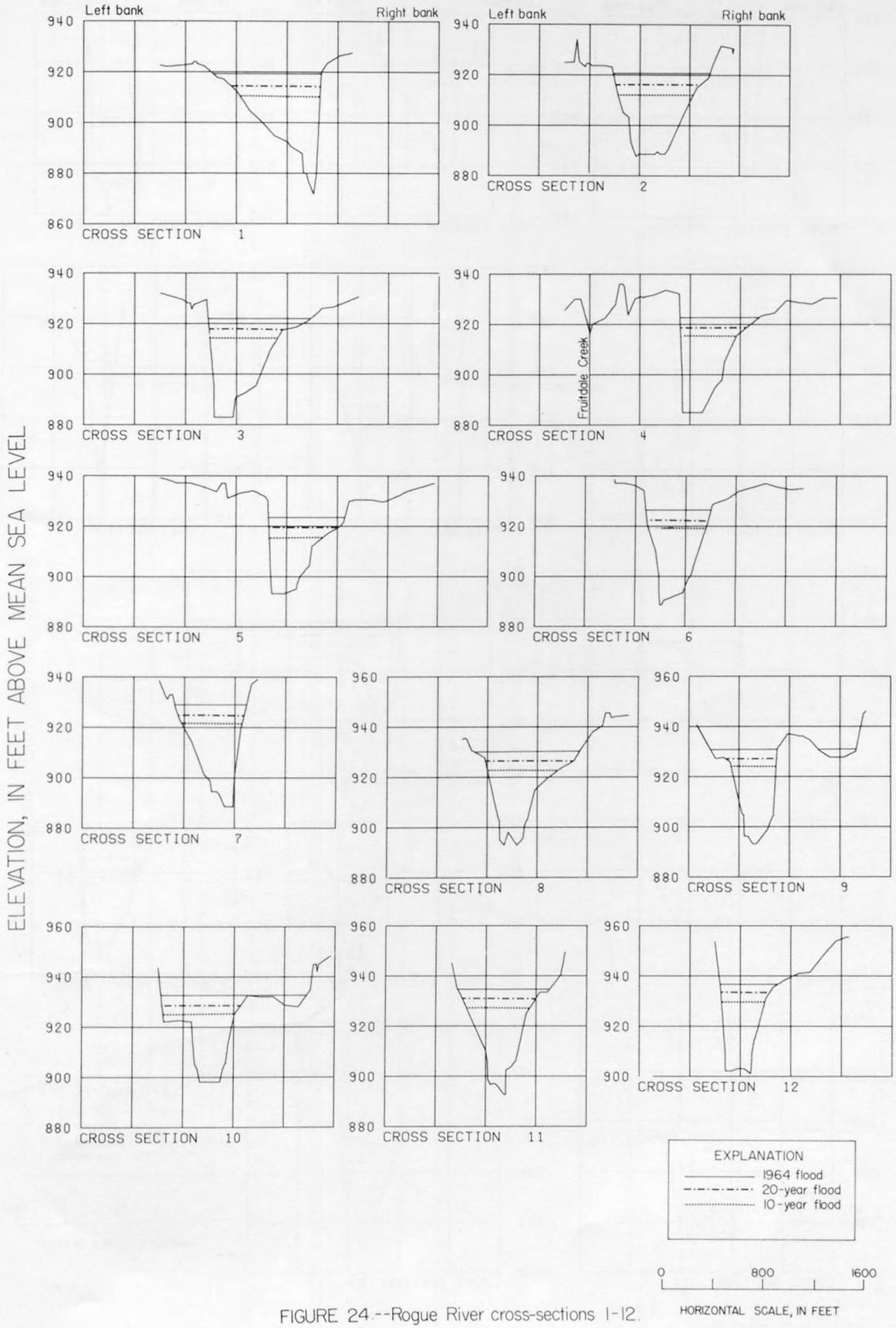

FIGURE 24.--Rogue River cross-sections 1-12.

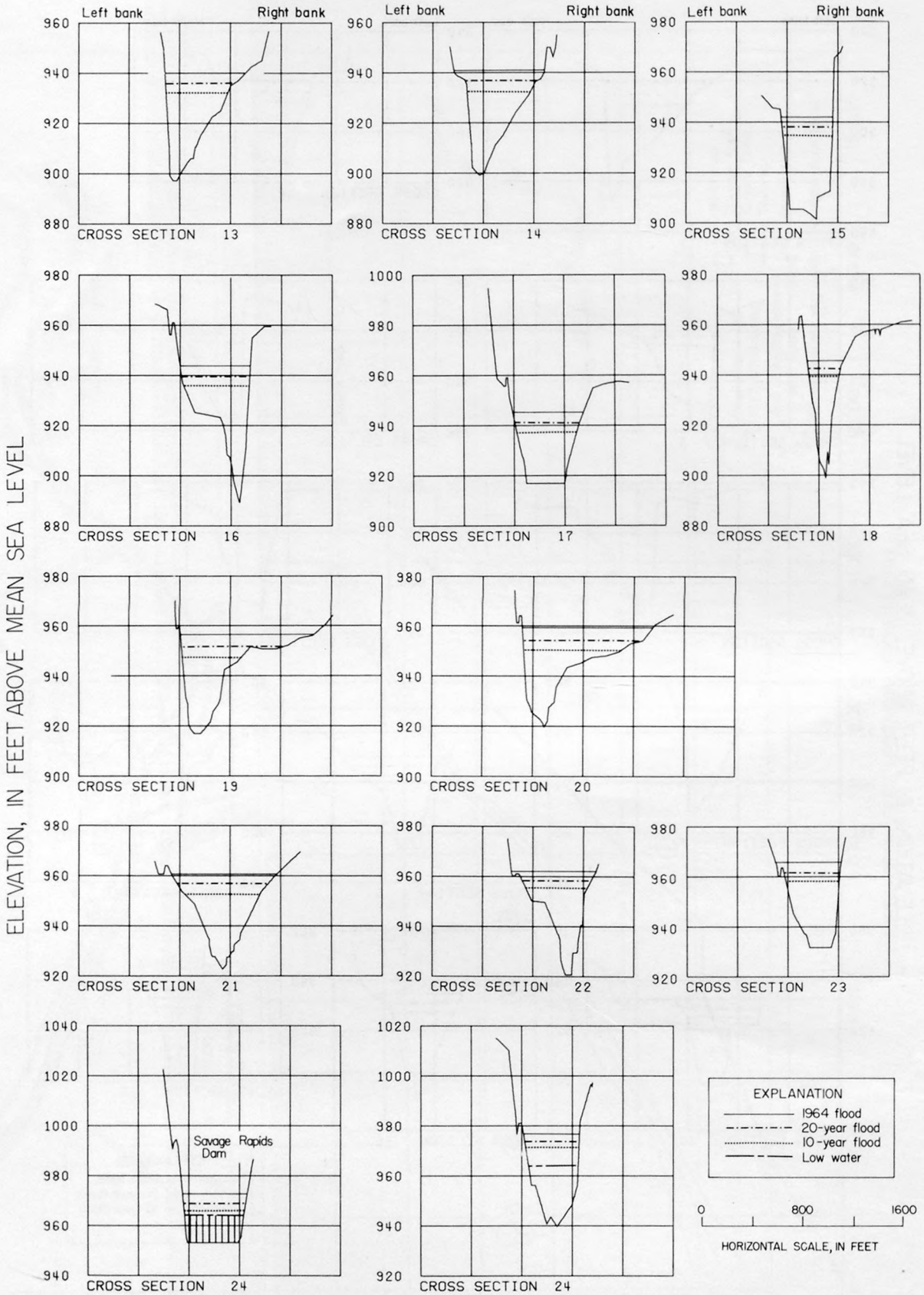

FIGURE 25--Rogue River cross-sections 13-24

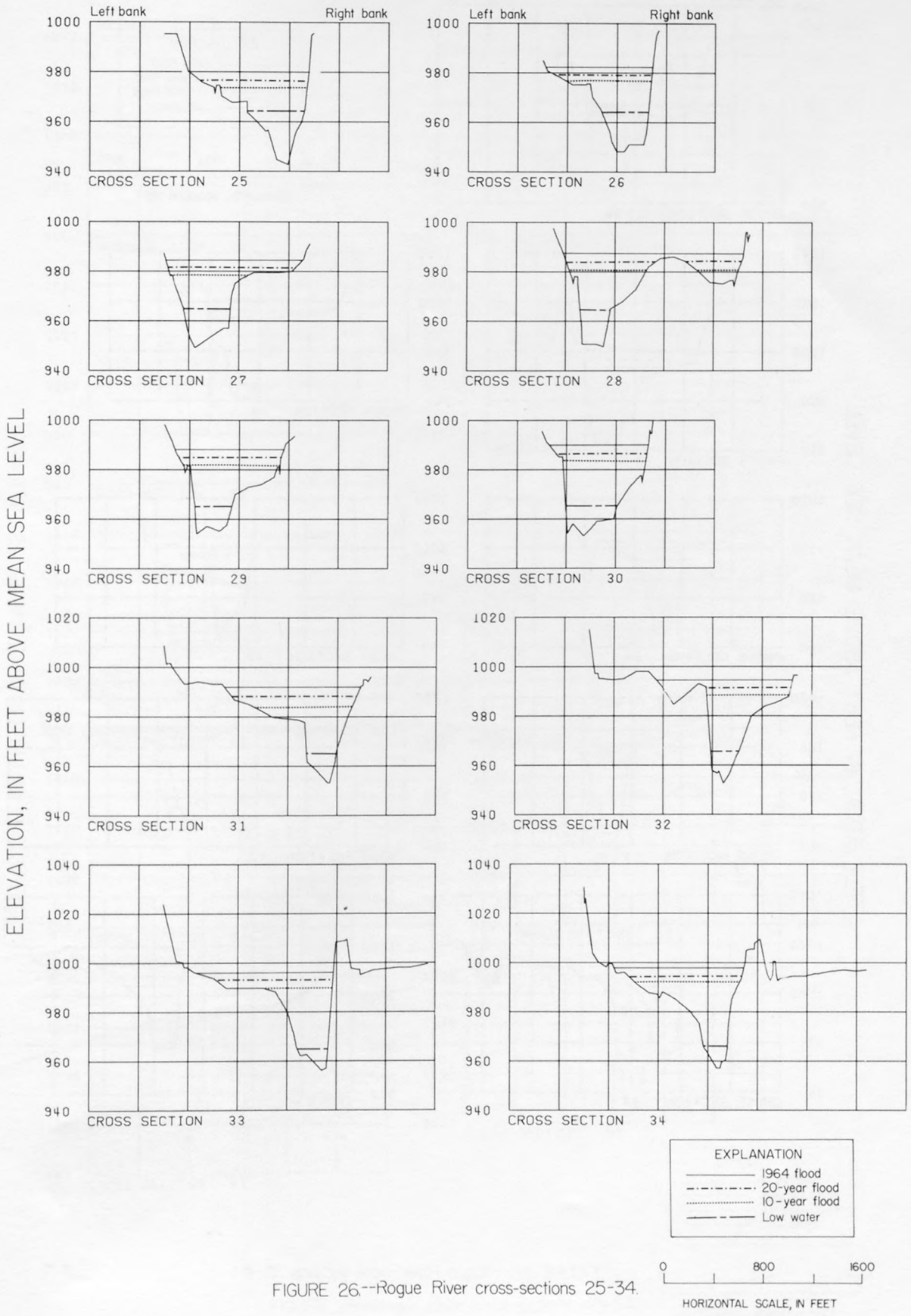

FIGURE 26.--Rogue River cross-sections 25-34.

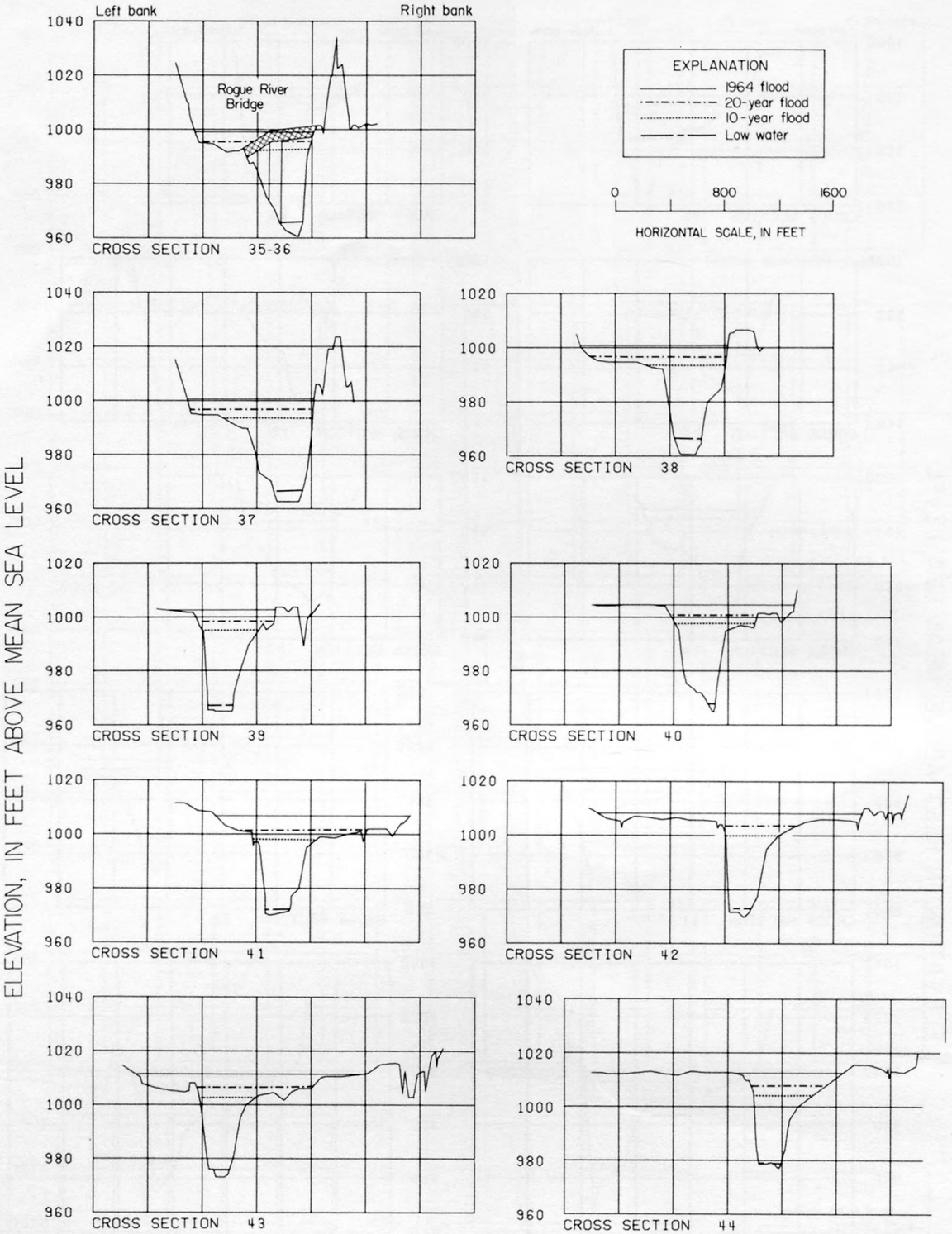

FIGURE 27 --Rogue River cross-sections 35-44

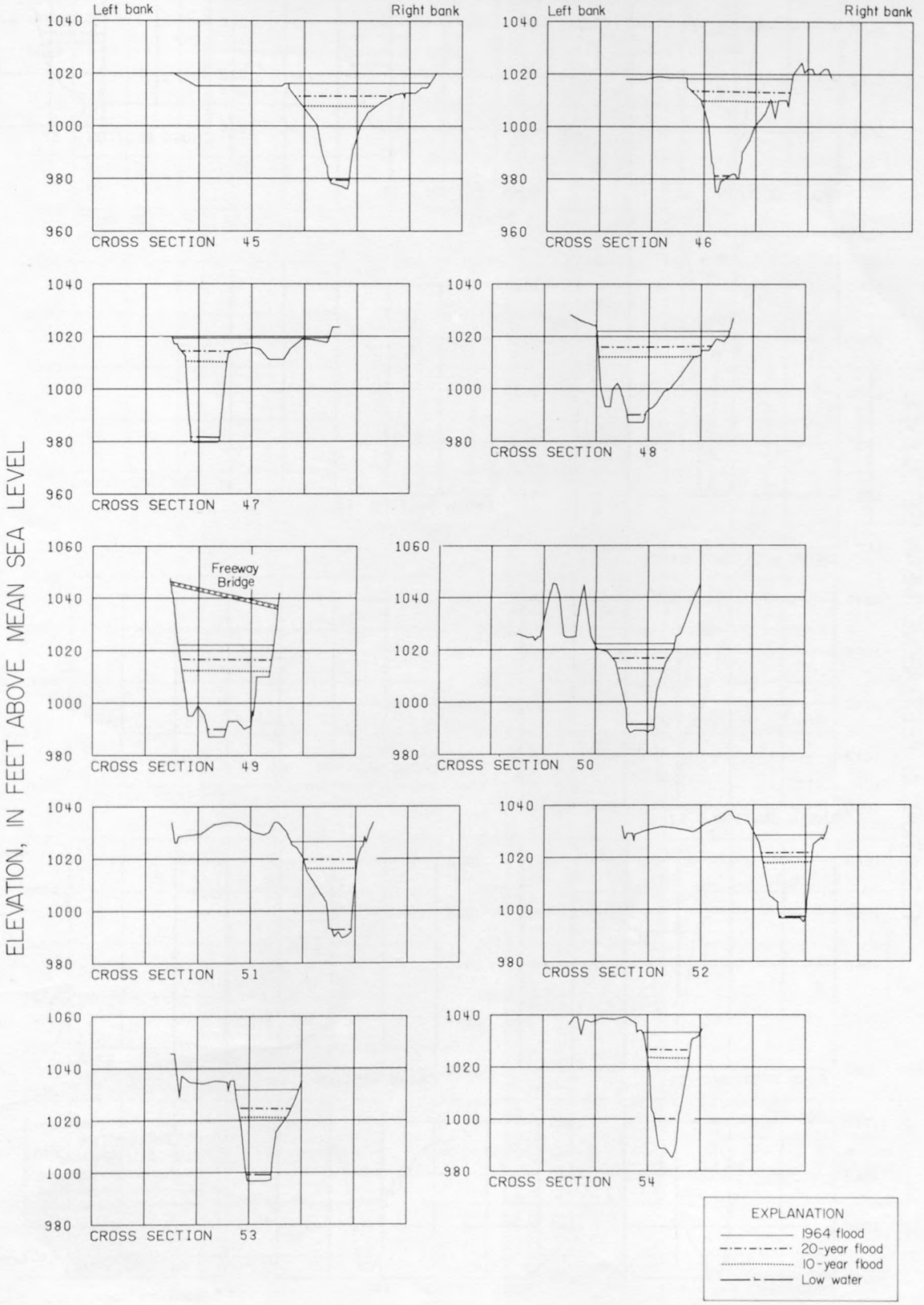

FIGURE 28--Rogue River cross-sections 45-54.

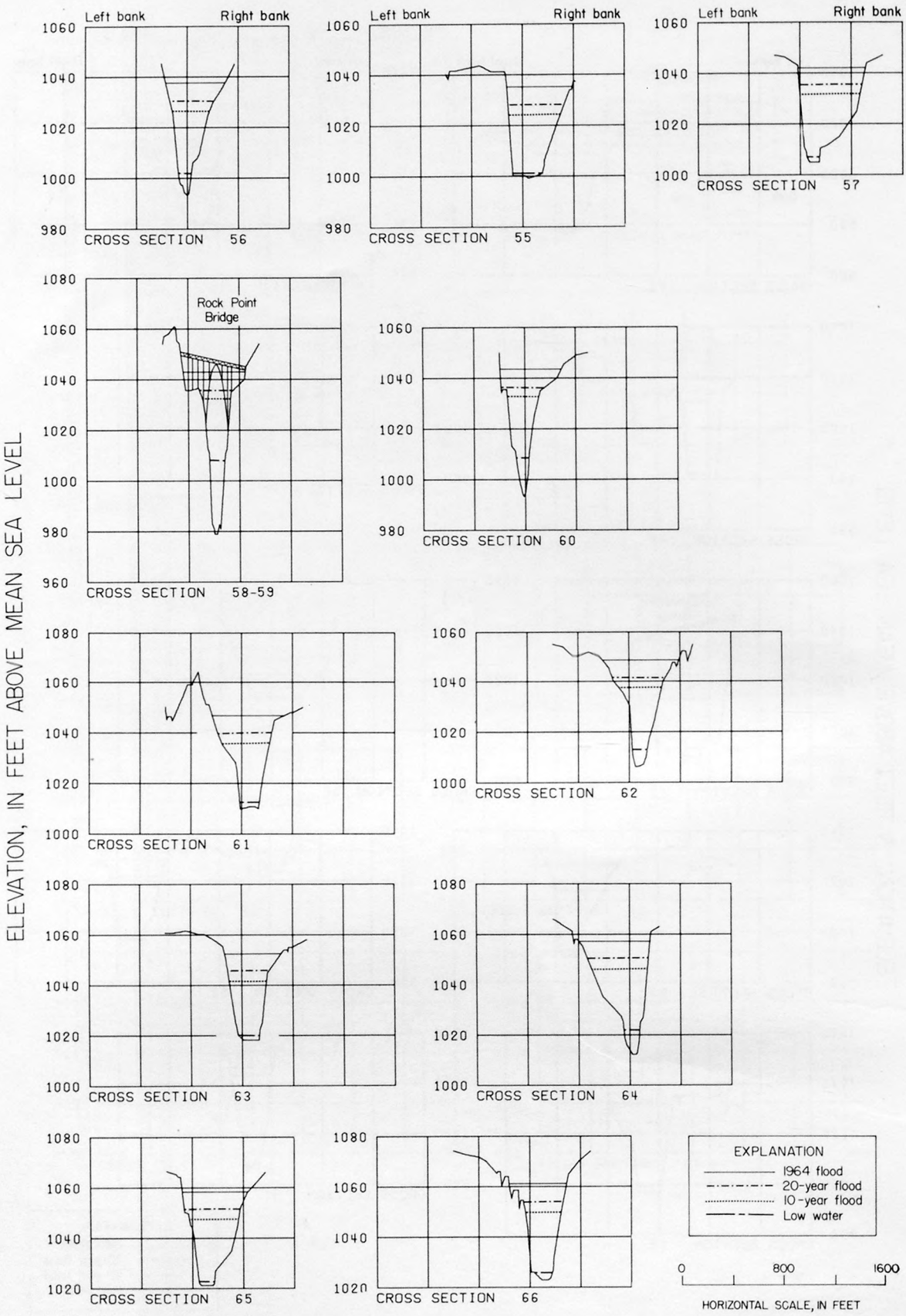

FIGURE 29--Rogue River cross-sections 56-66

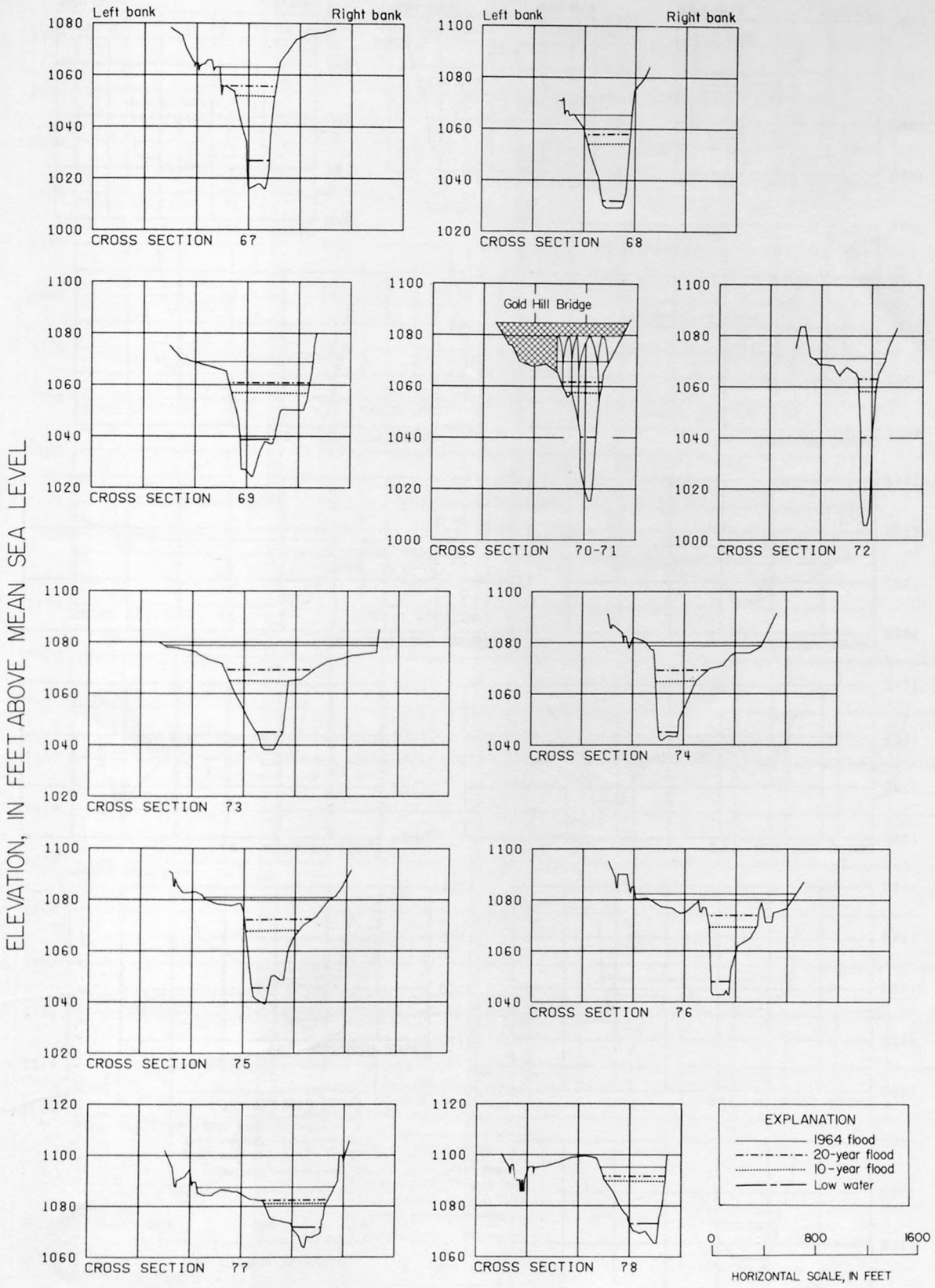

FIGURE 30--Rogue River cross-sections 67-78

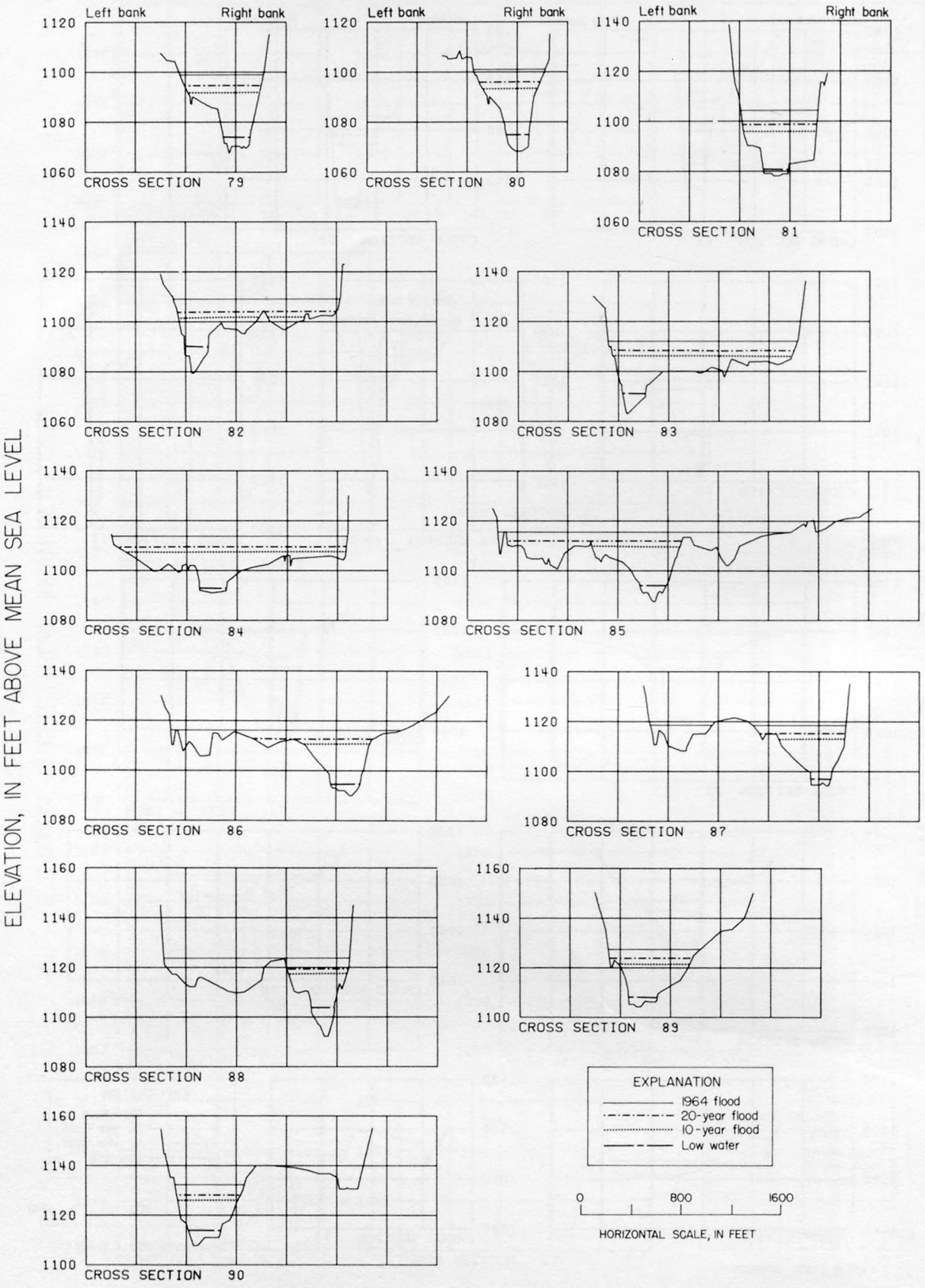

FIGURE 31 -Rogue River cross-sections 79-90

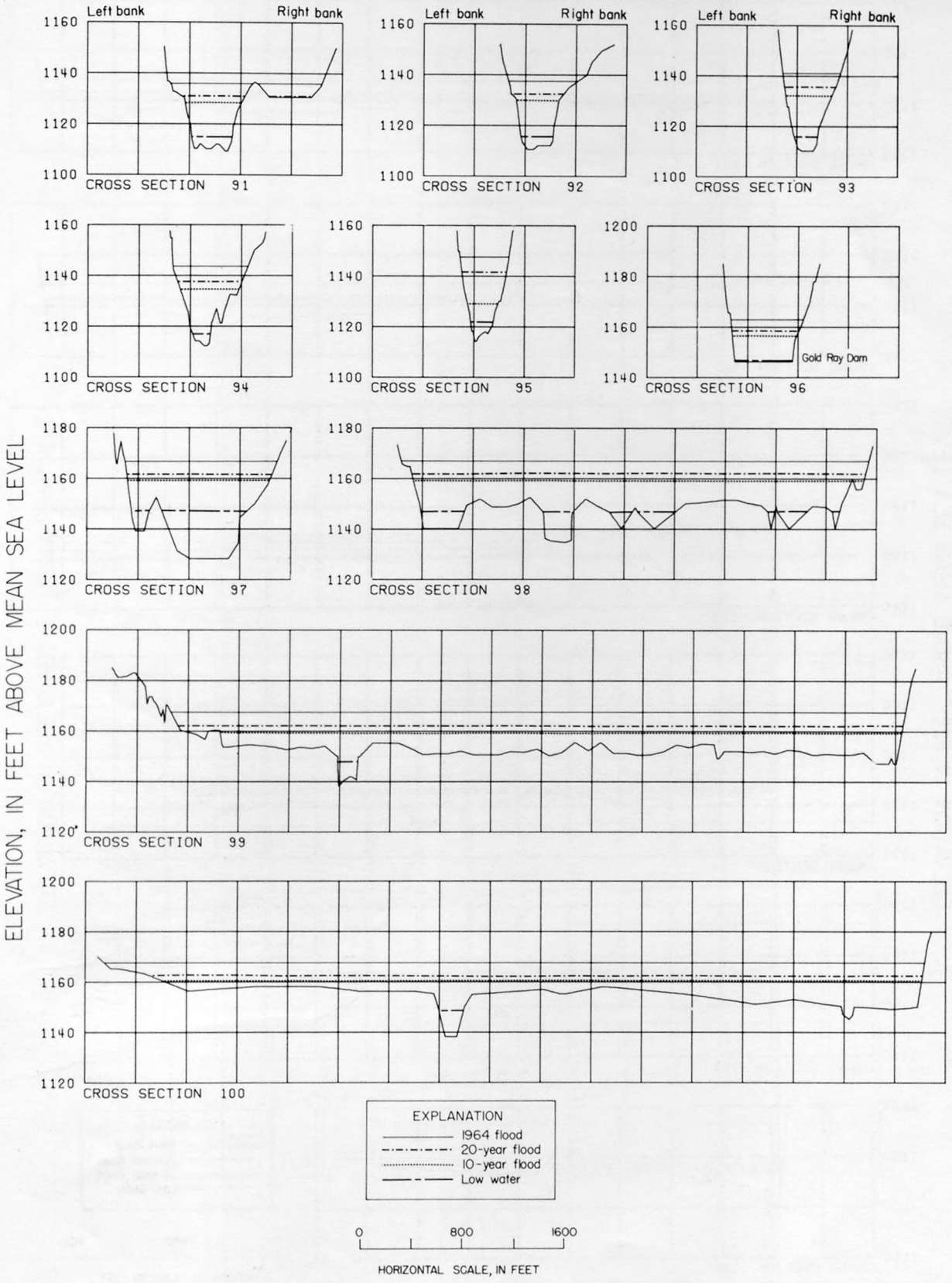

FIGURE 32 --Rogue River cross-sections 91-100.

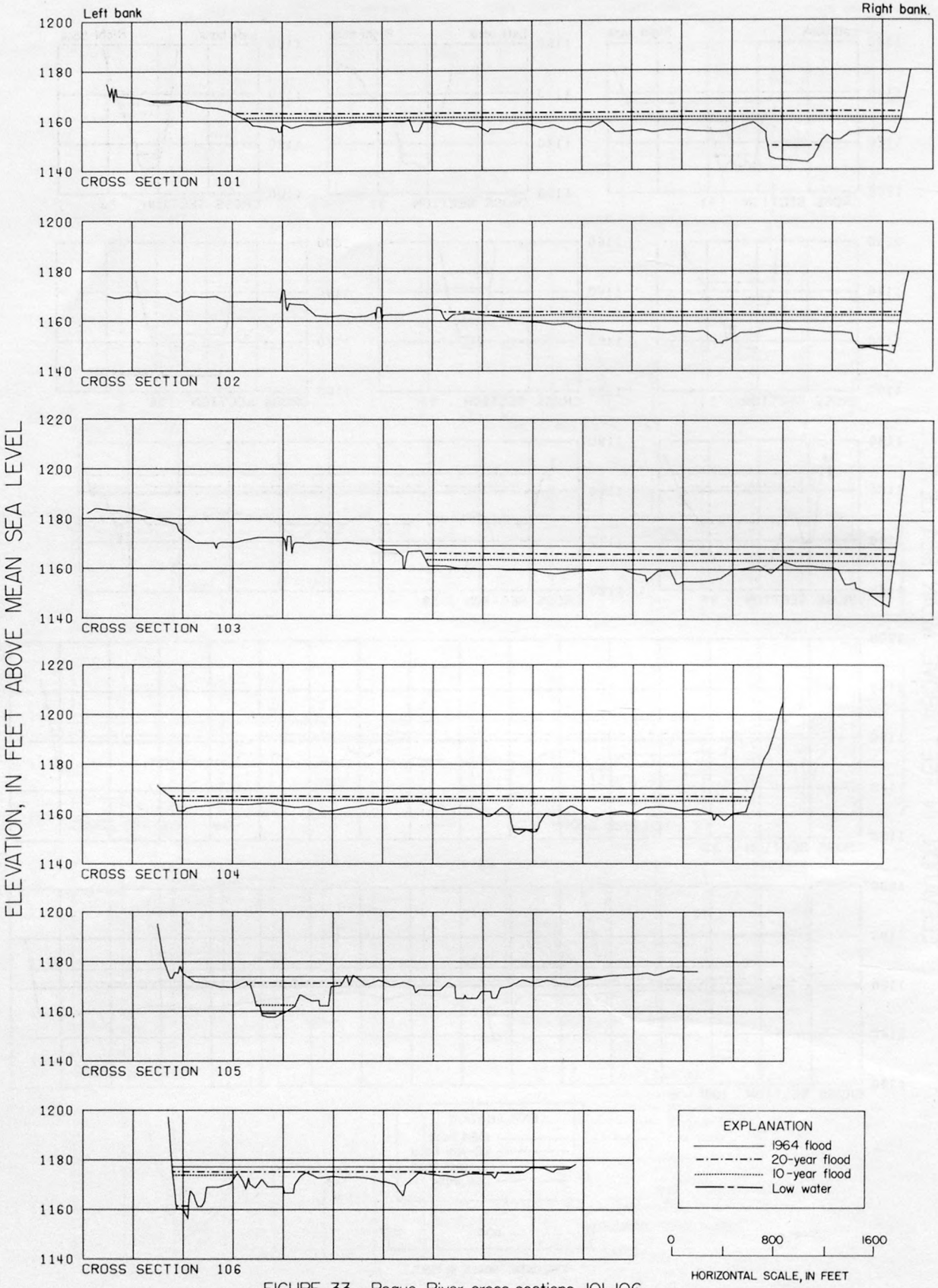

FIGURE 33. Rogue River cross-sections 101-106.

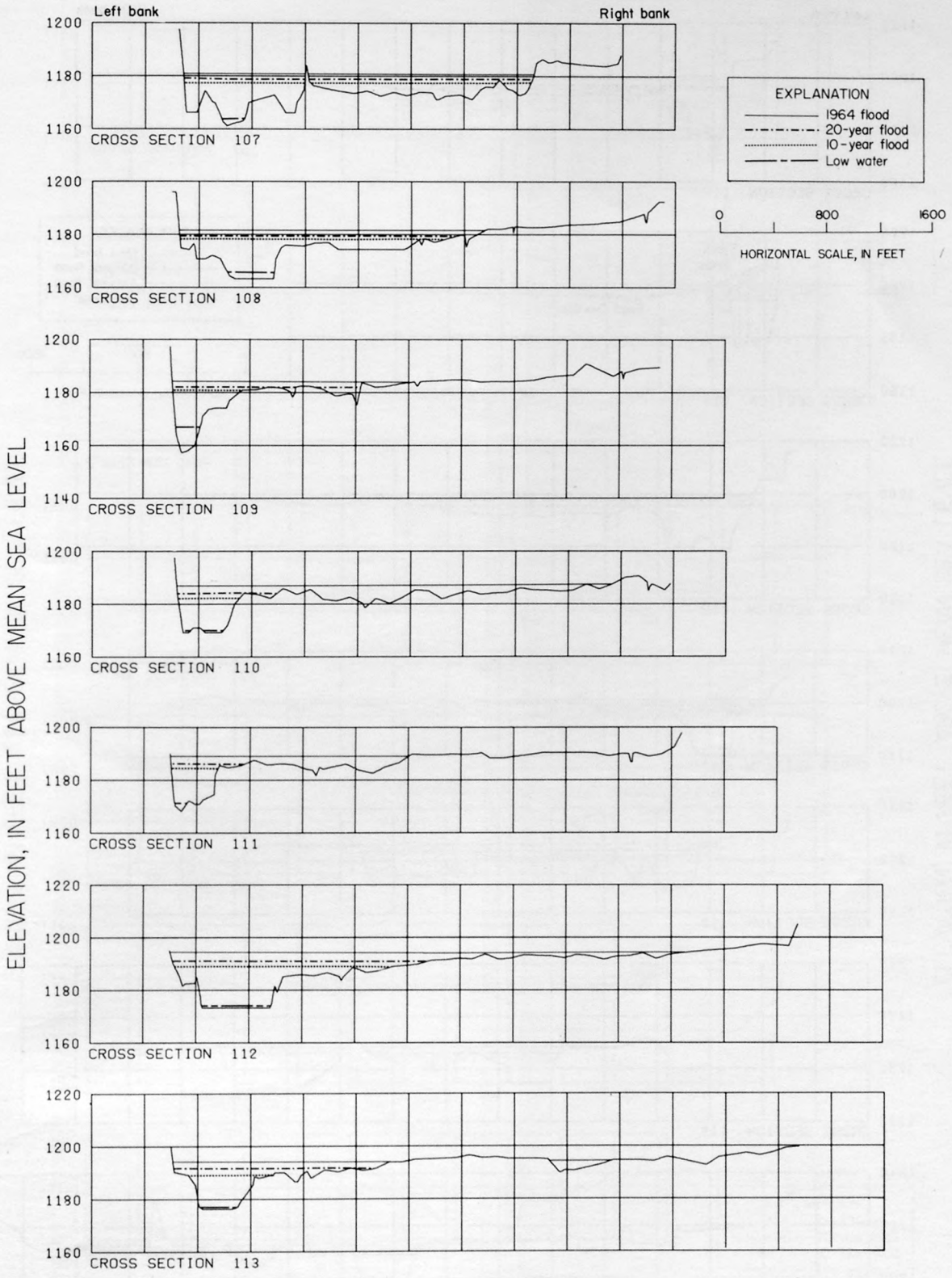

FIGURE 34.--Rogue River cross-sections 107-113.

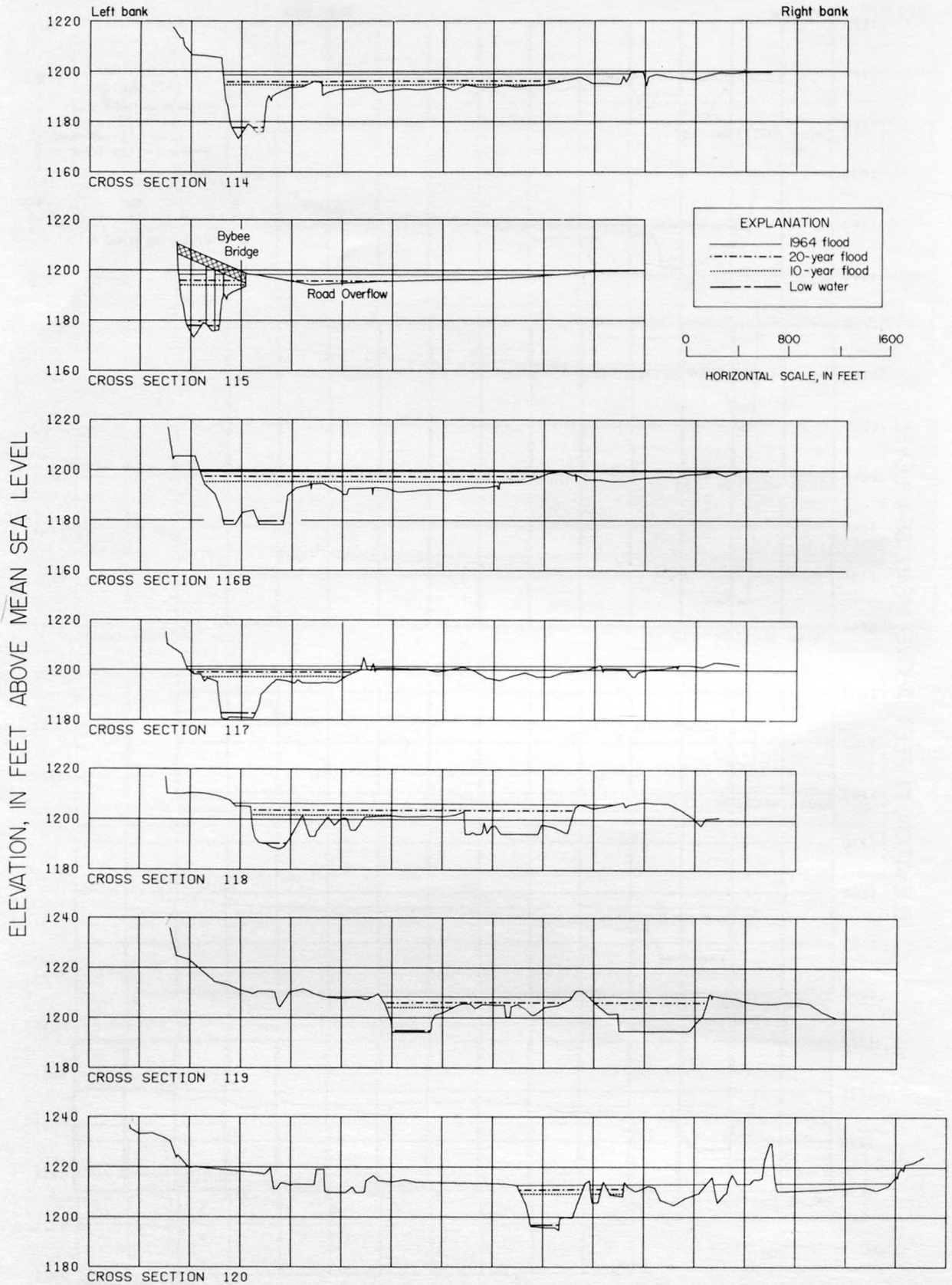

FIGURE 35.--Rogue River cross-sections 114-120.

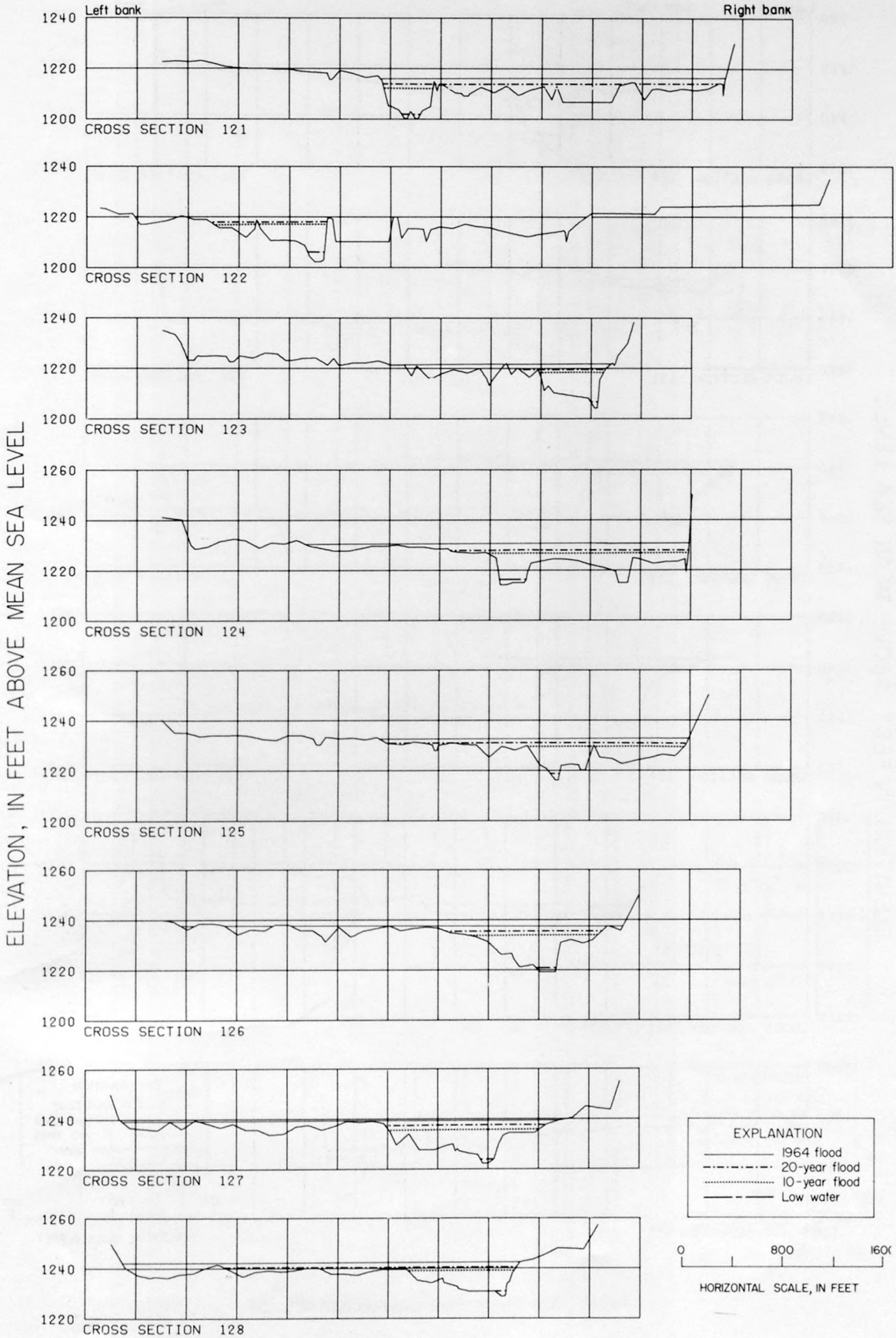

FIGURE 36.--Rogue River cross-sections 121-128.

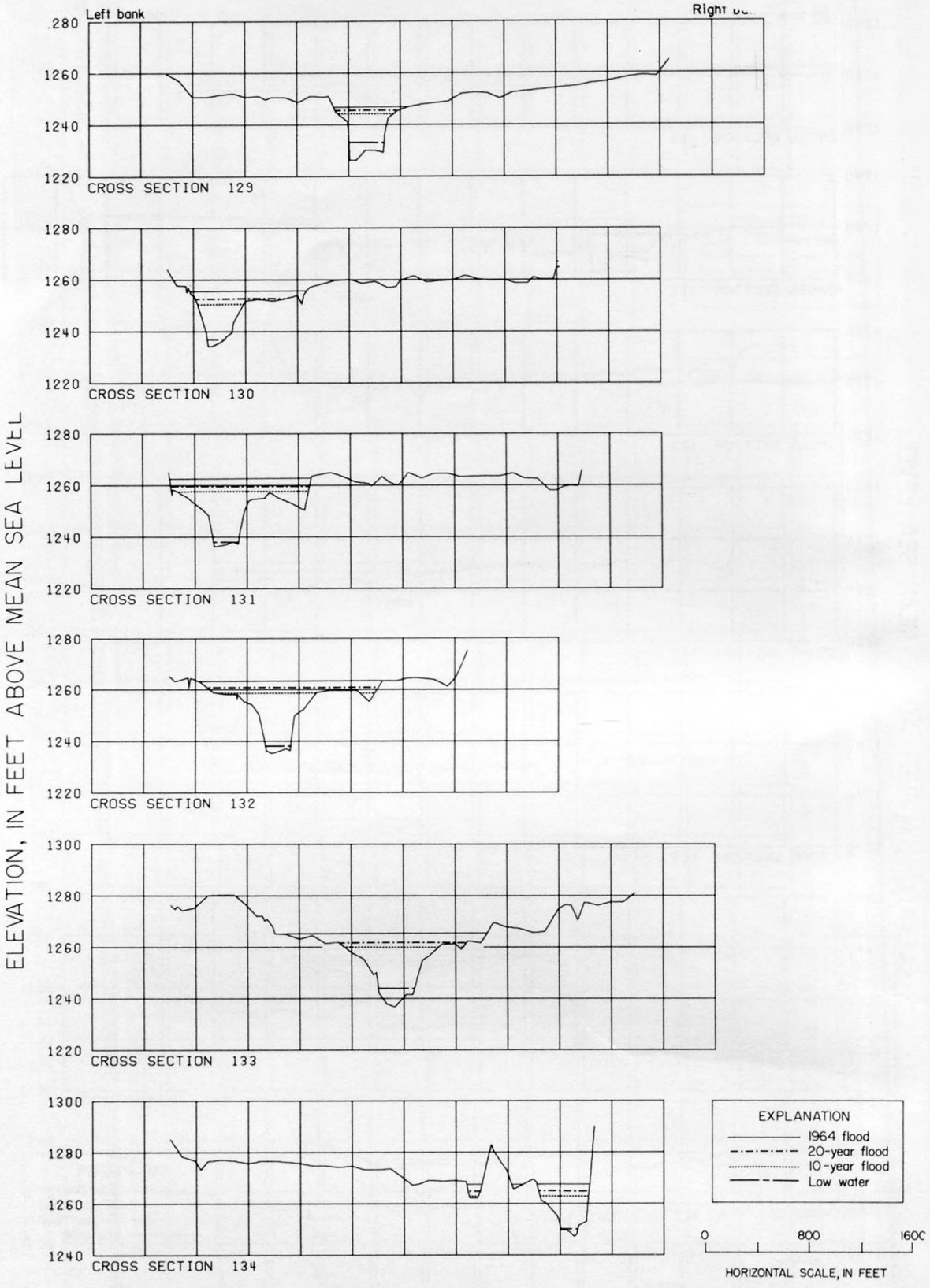

FIGURE 37.--Rogue River cross-sections 129-134.

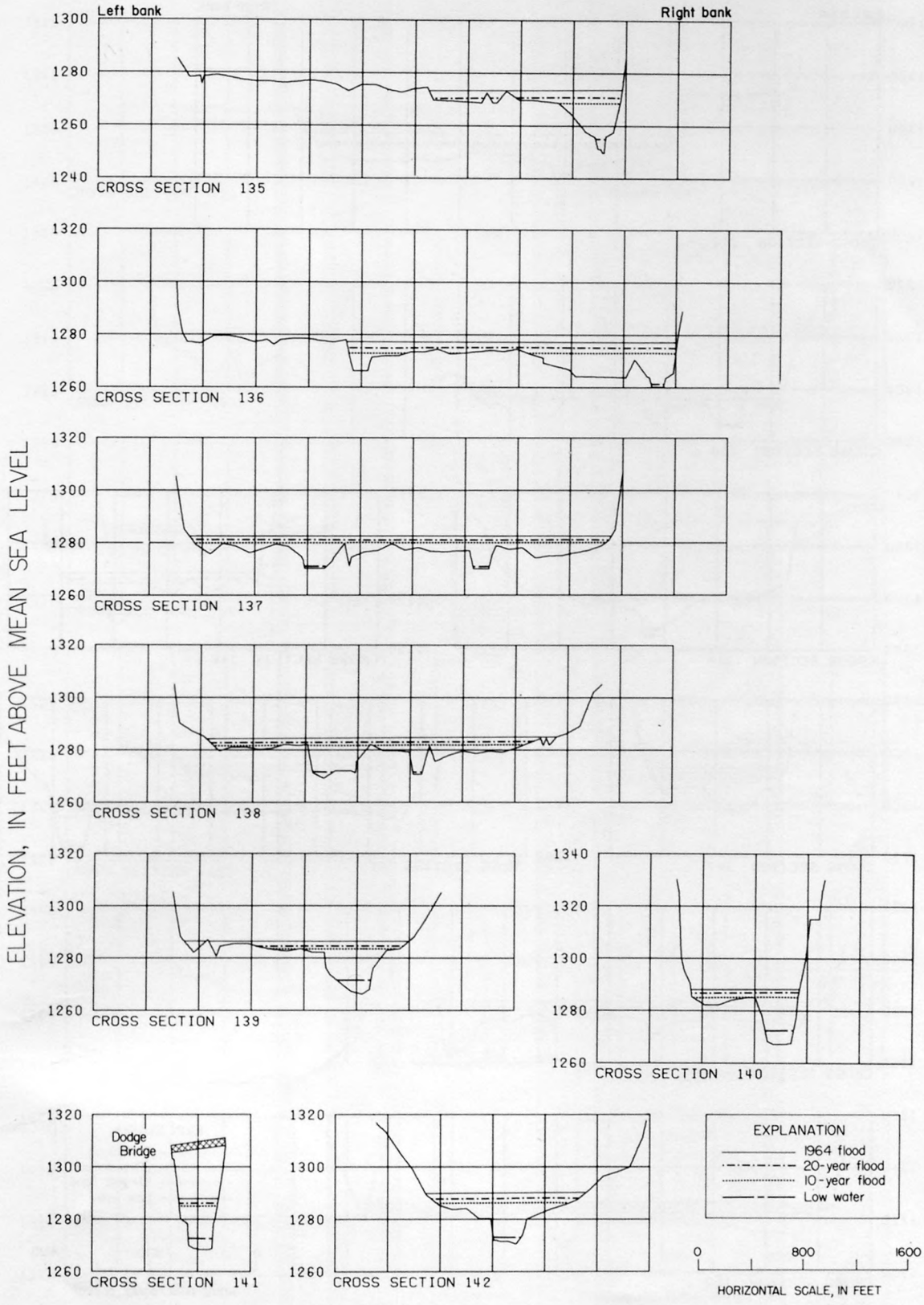

FIGURE 38.--Rogue River cross-sections 135-142.

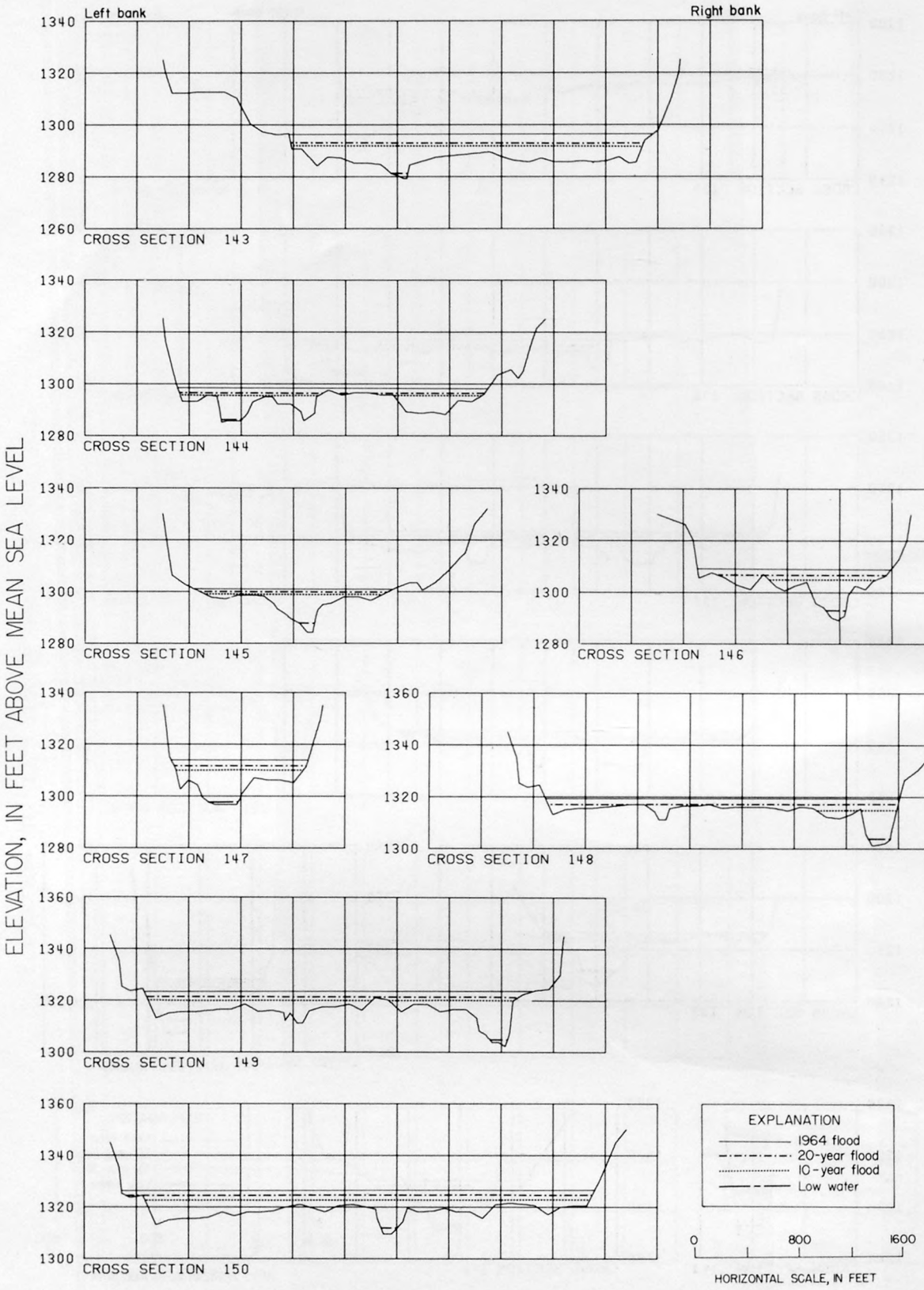

FIGURE 39.--Rogue River cross-sections 143-150.

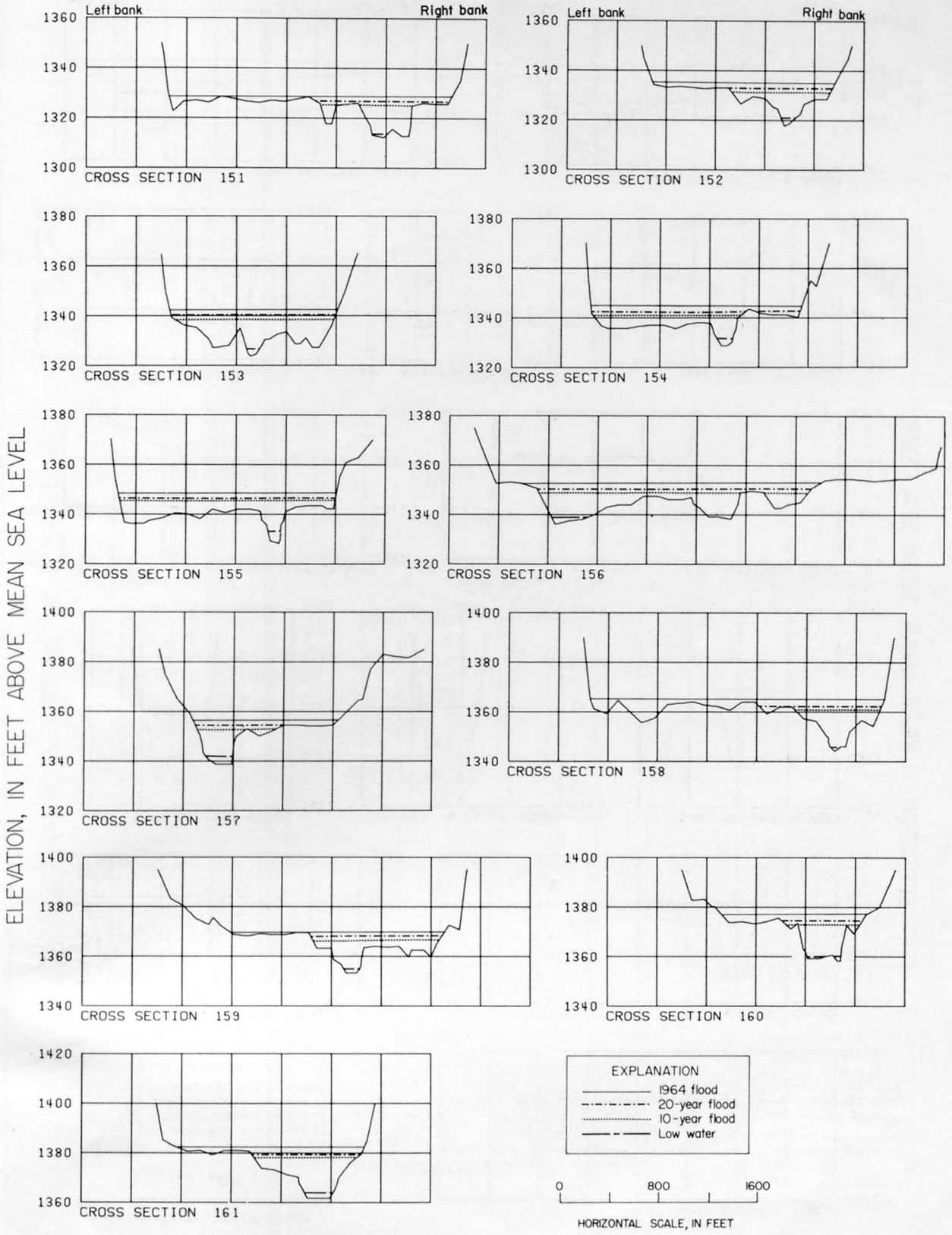

FIGURE 40.--Rogue River cross-sections 151-161.

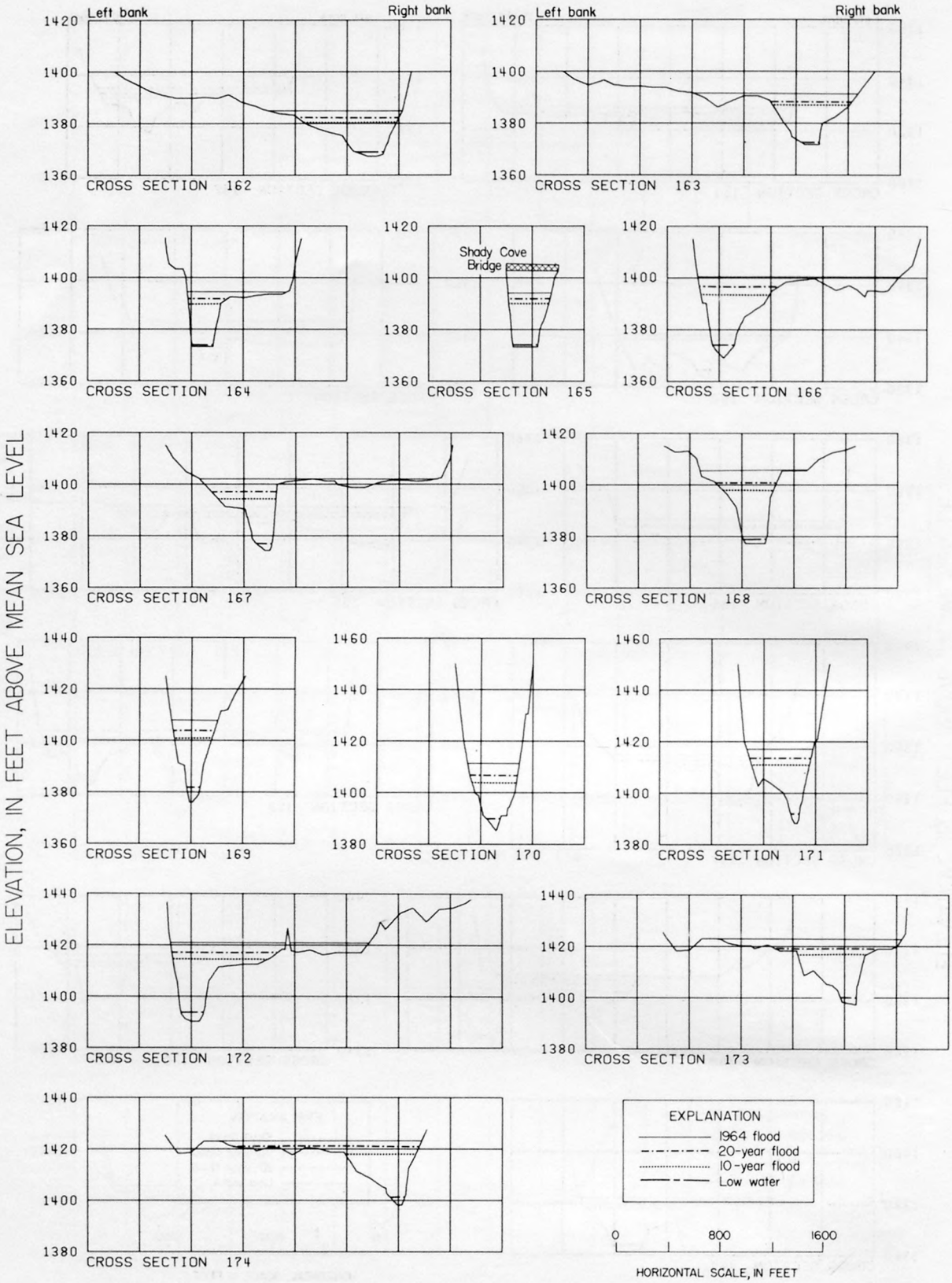

FIGURE 41.--Rogue River cross-sections 162-174.

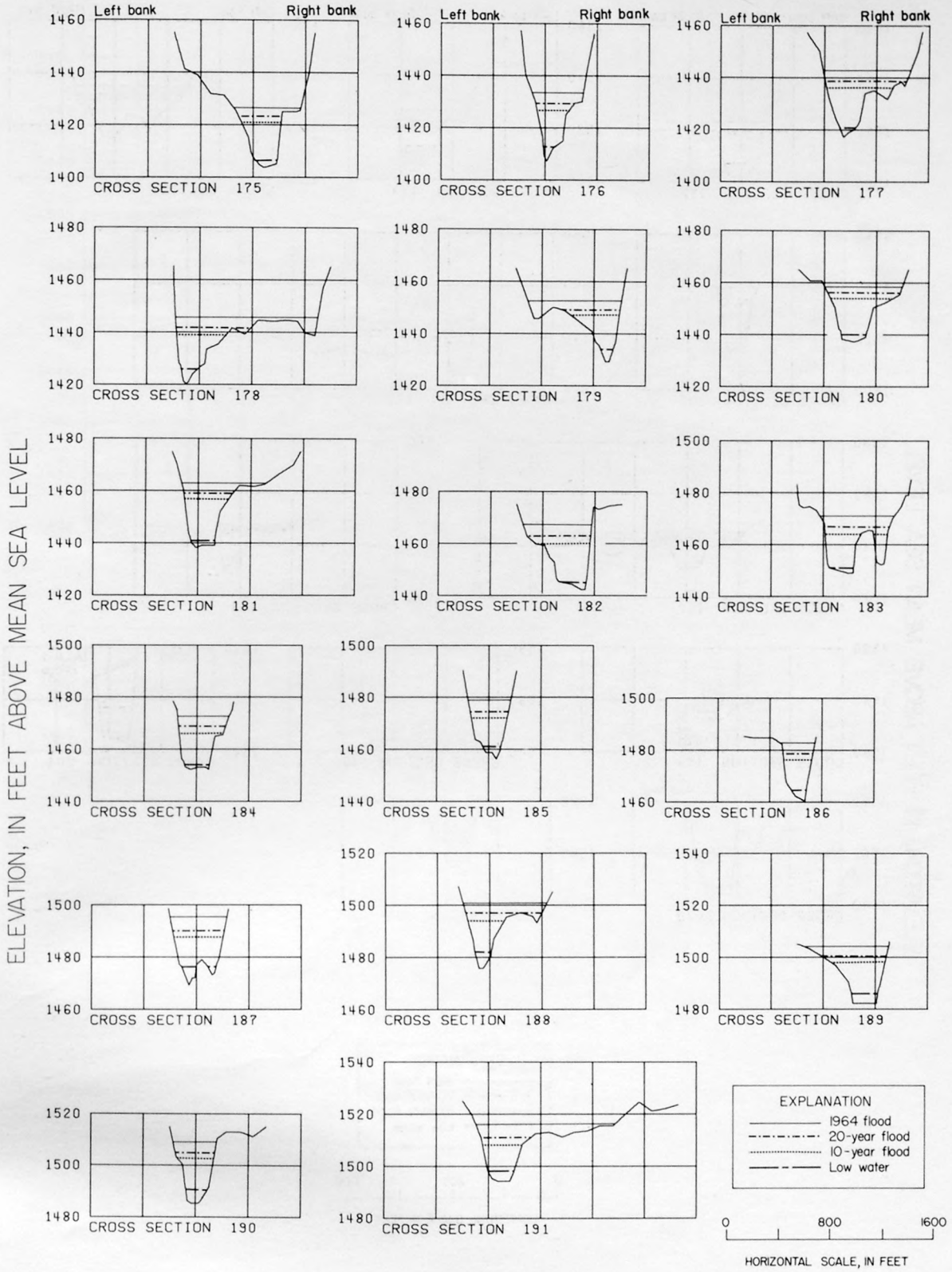

FIGURE 42.--Rogue River cross-sections 175-191.

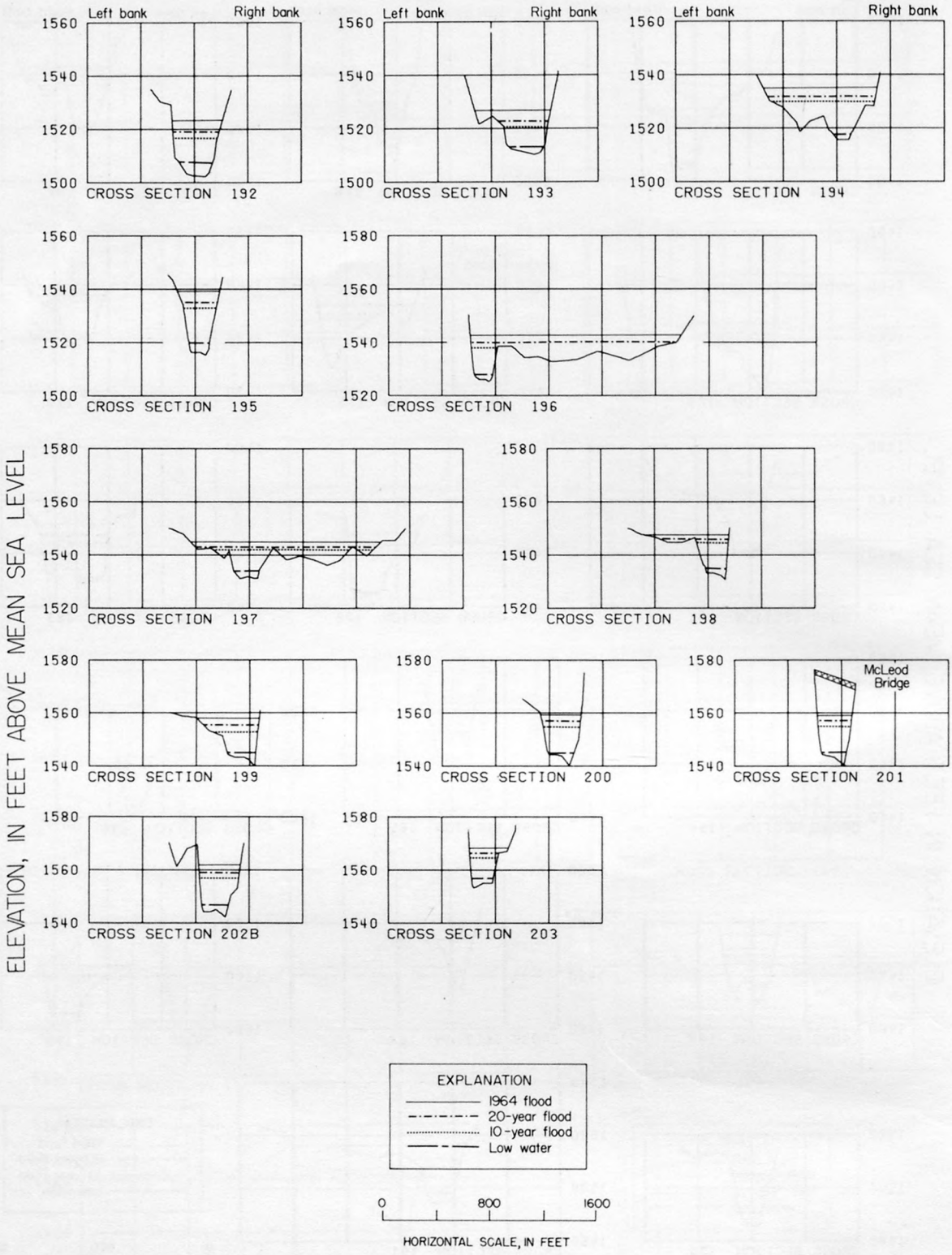

FIGURE 43.--Rogue River cross-sections 192-203.

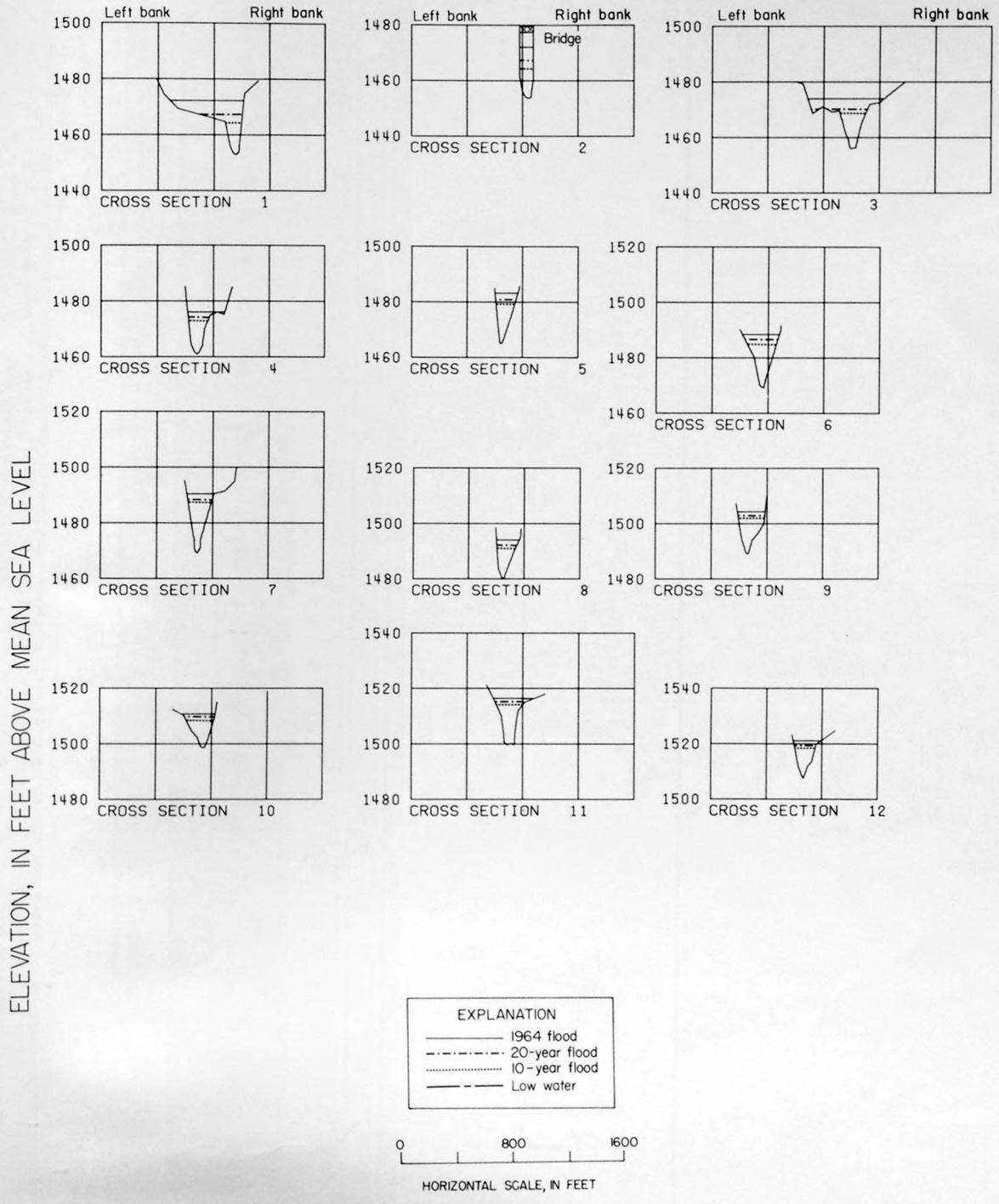

FIGURE 44--Elk Creek cross-sections 1-12.

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