

PROFILE ANALYSIS

The flood plain of the South Branch Shiawassee River is broad throughout the study area. For the 100-year flood, the width of the flood plain generally exceeds 1,500 ft (460 m) in the lower reaches; upstream the width of the flood plain narrows to about 500 ft (150 m). Beyond the limits of the mapped flood plain, the land surface remains relatively flat. These areas are subject to flooding from rarer floods (see plates 1-7).

Along tributary streams, the areas shown on the flood maps as being subject to flooding are those that would be flooded by backwater from the South Branch Shiawassee River. Areas along tributaries

subject to flooding by tributary flow may be greater than the areas flooded by backwater from the South Branch Shiawassee River.

The depth of flooding for floods of various frequencies can be estimated by subtracting ground elevations (determined from plates 1-7) from the water-surface elevations at the same point (determined from the flood profiles on figure 3). Flood depths in the overbank area range from 2 to 4 ft (0.6 to 1.2 m) for the 100-year flood, but they may be greater, particularly near the main channel of the South Branch Shiawassee.

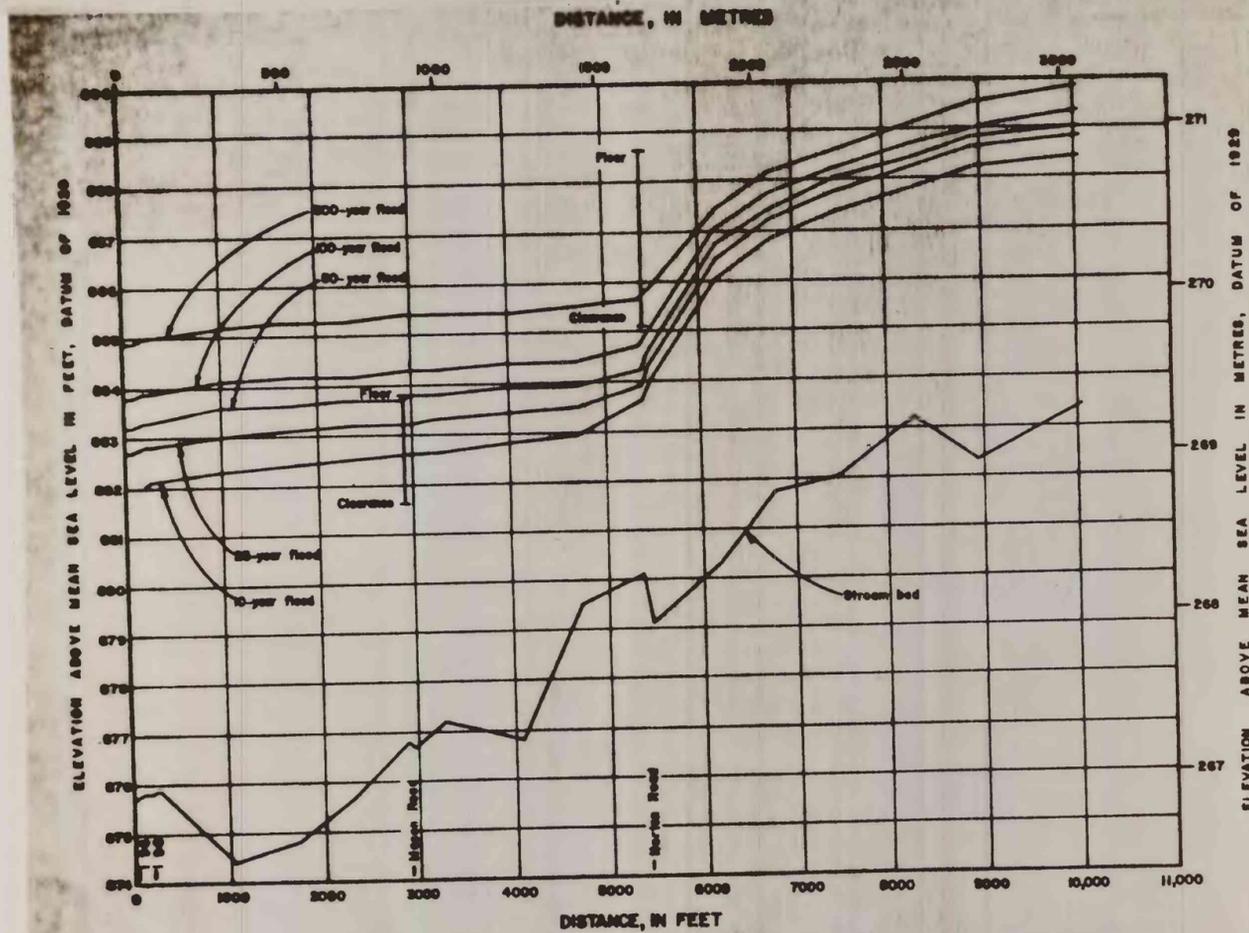


FIGURE 3. - FLOOD PROFILES OF SOUTH BRANCH SHIAWASSEE RIVER, LIVINGSTON COUNTY, MICHIGAN

EXTENT OF FLOODING

Flood profiles were determined by using a standard computer step-backwater model. The model computes elevations of the water surface for floods of selected magnitudes. Input to the model includes data on the geometry of the river valley, geometry of bridges, and field determinations of roughness coefficients of the river channel and overbank areas. Geometry for 23 cross sections of the river valley and four bridges was obtained. In addition, data for one culvert were obtained and discharges manually routed through it to

define its effect on the flood profiles. Cross section elevations for the overbank areas were obtained from aerial photography taken in 1973. The underwater parts of each cross section were measured in the field. All elevations are referred to mean sea level, datum of 1929. River distances between cross sections were measured along the main channel, beginning at I-96.

In order to assure reliable profiles in the study reach, it was necessary to determine flood elevations beginning at the Chesapeake and Ohio Railroad about one-half mile downstream from the study area.

SELECTED REFERENCES

- Bent, P. C., 1970, A proposed streamflow data program for Michigan: U.S. Geol. Survey open-file report, 37 p.
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- Witala, S. W., 1965, Magnitude and frequency of floods in the United States, Part 4, St. Lawrence River basin: U.S. Geol. Survey Water-Supply Paper 1677, 357 p., 14 figs., 1 pl.