



Here channel bed profile and the water surface elevation at a 1.2-inch rainfall are compared to persistent scour lines and stable bar heights. The scour lines and bar elevations used in this analysis are generally at the lowest elevation of a persistent, extended scour line and a vegetated, consolidated bar. In many stable streams, these features occur at a consistent elevation corresponding to the dominant discharge, roughly the 1.8-year return interval. The field investigation revealed very few bankfull features at any elevation. Those few features identified as potential bankfull floodplains occurred at elevations between 2 and 5 feet above channel bed depending on distance from the Withlacoochee River.

Longitudinal Profile

The longitudinal profile of a stream is one of the most useful diagnostic tools for determining the fluvial processes active in a stream system. **Figure 3.3.19** illustrates the stream in profile and depicts the reach average and bed slope. The figure includes an idealized profile of a stable, pre-incision bed. The juxtaposition of the bed and idealized profiles indicates areas of incision and deposition. Road crossings and the railroad crossing interrupt the geomorphic processes by limiting the upstream advance of incision. Sediment is stored upstream of Baytree Road and Lankford Drive. The relationship between bed profile, water surface profile, applied shear and geomorphic processes will be discussed further in Section 3.4.

3.3.4 Boundary Material

The bed and bank materials are composed of the native soil, large woody debris, introduce debris and rock, vegetation, and groundwater.

Soil

The main stem and major tributaries flow through Johnston loam; the upper tributaries generally flow through any of several sandy loams. The stream has incised to a resistive clay layer. Loam over clay occurs in the upper reaches and may occur throughout the basin. However, the loam is often more sandy downstream. Much of the city soil is now classified as urban land but it is likely that the underlying soil is Tifton loamy sand; a wide band of this formation runs from southwest to the northeast of the city. Compared to the adjacent watersheds, the Sugar Creek system is slightly less sandy and more loamy. The bed of the stream is generally stiff clay that is overlain by a washload of fine sand. The published value for the shear resistance of stiff clay is 0.26 psf. Based on the applied bed shear calculated from the hydraulic model and observations in the stream, scour occurs at values greater than 0.27 psf. The stiff clay, debris and the washload of sand determines the morphology of the stream.

Debris

This discussion of debris includes large woody debris, dumped concrete, rock, and other waste. Other waste includes discarded appliances, household garbage, and similar materials. There are extended areas of waste concrete dumped on the streambanks particularly north of Baytree Road.