

Riparian Notes

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Floodplain Clarification

After the last issue of Riparian Notes, (*What is a Creek?*), one reader commented that he did not consider the floodplain to be a part of the creek. Then, at a recent riparian workshop, participants and instructors alike were uncertain about the proper identification of the floodplain on two creeks in central Texas. This confusion indicates a need to clarify what is meant by the term “floodplain” and how that term is used in several different contexts.

To some, the term floodplain refers to the **100 year floodplain**. This designation is widely used for city planning and flood insurance purposes. It is the estimated extent that floodwaters reach on those extraordinary but rare flood events that theoretically occur at a 1% probability in any given year. This designation has limited practical relevance to riparian workers. The 100 year floodplain is located far above the active channel and far above the active floodplain and usually includes one or more abandoned floodplain terraces. The 100 year floodplain includes both upland areas, as well as riparian areas.

To the professionally trained stream hydrologist, the floodplain is defined totally different. For hydrologists, the **geomorphic floodplain** is that area starting at or just above the bankfull elevation where frequent flood events spill out of the channel. In this context, the floodplain is much lower in the landscape and is inundated in relatively frequent events, such as once every 1 – 3 years. It is often calculated to coincide with the theoretical 1.5 year return interval discharge or a 66% probability of occurrence in any given year. The hydrologist might employ some fairly complicated watershed, runoff and discharge calculations to help determine where the bankfull elevation is and where the active floodplain should be located. Using this technical definition, everything below bankfull and everything below the geomorphic floodplain is considered to be part of the channel. These designations can get pretty complex and technical for those who are not well versed in stream classification and stream hydrology. The trained hydrologist will often rely just as much on visual indicators (described below) as they do on calculations and graphs.

To the average layman who is just trying to understand the basic dynamics within the creek-riparian area, the floodplain concept can be simplified somewhat. In order to designate the location of the **active riparian floodplain**, the function of the floodplain must first be understood. The floodplain is the energy dissipater of the creek. The channel is meant to confine and transport high-energy flows of water and sediment. This high-energy conduit needs a means to dissipate that energy much like a pressure relief valve on an air tank. Without a pressure relief mechanism, catastrophic failure is inevitable. The floodplain is the pressure relief mechanism of the creek. It is normally a relatively flat topographic feature adjacent to the channel that allows floodwaters to spread out and thus dissipate energy. When flood energy is dissipated, the velocity of floodwater is reduced and sediments begin to settle out. All of this happens best when the active riparian floodplain is properly vegetated with riparian grasses, sedges, shrubs and trees. The root masses of these plants anchor them into the floodplain and hold the sediments in place. The above ground parts of these riparian plants help to physically disrupt and retard the energy of floodwater and to trap and stabilize sediments. Understanding the function of the riparian floodplain helps the layman to identify its location in the field. Look for a flat bench near the channel where there are signs of frequent sediment and debris deposition. Also look for signs of riparian-wetland vegetation (OBL, FACW and FAC species) on these benches. These two indicators may be the simplest way to identify the active riparian floodplain.

Ideally, the location of the geomorphic floodplain identified by the hydrologist will match up to the location of the active riparian floodplain identified by the layman based on visual indicators. When the two do not match up, the best advice is to let the creek tell you where the floodplain is.

Yes, the floodplain concept can be confusing. But it is an integral and important part of the creek, and we need to understand it. Go to a creek and ponder these things. Take a pole with you and catch some grasshoppers. If the fishing gets slow, take a floodplain walk and consider these things.