

Appendix G

Glossary of Terms

The following are terms commonly used in fluvial geomorphology and river engineering but which may not be familiar to those practicing in other disciplines.

Angles of juncture – The angle at the confluence between two streams, typically a tributary to main stem confluence. Sharp angles of juncture, or right angle confluences, indicate geologically controlled reaches, typical of watersheds with a strong bedrock influence. Acute angles of juncture indicate an uncontrolled confluence, typical of dendritic watersheds in loess or alluvial soils.

Angularity – Angularity refers to the angle of directional change in the streams comprising a watershed. High angularity refers to abrupt or irregular changes in stream direction, while low angularity refers to gradual changes in stream direction.

Bankfull elevation – In classical terms, the elevation in the channel where water surface reaches the top of the stream banks, also referred to as “top-of-bank” elevation. When the water surface rises above the bankfull elevation it crests the banks and spills over onto the bankfull floodplain. In urban streams, the bankfull elevation generally coincides with the dominant discharge elevation. This elevation corresponds to the stream forming flow, which creates bankfull floodplains.

Bankfull floodplain – The bankfull floodplain is a low, vegetated terrace, formed by, and an indicator of, the bankfull discharge. In incised streams, bankfull floodplains form as internal shelves within the main channel. While not an absolute diagnostic, functioning bankfull floodplains indicate stable reaches. Bankfull floodplains fulfill the important function of reducing stress on the stream banks. When the flow crests the internal floodplain, the velocity and thereby the shear stress is reduced as the flow spreads across the internal shelf.

Base flow – In a perennial stream, the low flow discharge is attributable to groundwater flow.

Channel evolution – The progression of channel form (usually expressed as cross-section) over time as a response to a disturbance. The conceptual model was originally developed as a four-stage model and later refined by Andrew Simon to include a disturbance event.

Conservation culvert - A culvert is explicitly designed to accommodate a dominant discharge channel. There are a variety of design approaches for achieving this objective. Many have a box or bay set above or to the side of the channel. This higher flow bay is accessed only when the flow exceeds the dominant discharge. This design is used to achieve adequate flood conveyance without widening the channel at the base. This avoids upstream incision and subsequent re-narrowing of the channel when streams are over-widened in

conventional construction. This design also allows sediment competency to be maintained.

Degree of uniformity – The homogeneity of a drainage network pattern. A uniform watershed has drainage patterns that are repetitively similar, whereas a non-uniform watershed has areas of sub-patterns, which differ from other areas of the watershed.

Dominant discharge – The dominant stream-forming flow or recurring flow, which is responsible for the majority of work and channel maintenance in a stream. It is the flow that over time has the greatest influence on stream form. The recurrence interval for the dominant discharge of most streams is roughly 1.5 years, as determined by flood frequency analysis. In urban areas with highly altered hydrology, this return interval may be much more frequent. The dominant discharge is sometimes referred to as the bankfull or stream-forming discharge.

Drainage network density – The number of drainageways per unit of land surface. Therefore, high-density watersheds are covered with many closely spaced drainageways, while low-density watersheds have relatively few drainageways in a given land area.

Fluvial geomorphology – The scientific discipline concerned with the study of how moving water shapes landforms.

Headcut – Often used interchangeably, knick point and headcut are both used to describe an abrupt discontinuity in bed slope indicating the upward limit of advancing channel incision. However, while the term knick point describes only the physical discontinuity as observed on the long profile, headcut implies motion, used to describe a rapidly advancing knickpoint.

Imbrication - Imbrication refers to the pattern of bed load deposition. Larger particles such as cobbles, concrete slabs or shale plates deposit on the streambed in a “fish scale” pattern. The stream power necessary to move these larger particles generally results from mid-intensity storms (10 – 25-year events). Imbrication armors stream beds from the major storms and is one indicator of competent bedload transport.

Incision – Vertical channel adjustment, or channel downcutting, generally in response to an alteration upstream or downstream of the incising reach. Incision occurs when sediment or transport material is more easily removed from the channel bed than it is from the stream banks. Bed material is liberated to “heal” a temporary disturbance in sediment transport equilibrium or channel shape.

Knick point – An abrupt discontinuity in bed slope indicating the upward limit of channel incision. A knick point usually occurs at a resistant hard point in the

channel bed, such as a geologic control, debris jams, *de facto* grade control, or manmade structure.

Knick zone –Typically observed in loess or alluvial streams, a knick zone is an area of slope discontinuity similar to a knick point, but less pronounced and occurring over a greater length of channel. In bedrock streams, knick zones occur as a series of smaller knick points

Left (and right) descending bank – Refers to either side of the channel in relation to the downstream flow of water. For example, left descending bank refers to the left-hand side of an in-channel observer facing downstream. This designation is the convention in river science and engineering.

Longitudinal profile – A profile survey down the thalweg of a stream. A thalweg profile is not a channel centerline profile and the two are not interchangeable. Longitudinal profiles are used both for diagnosis of dominant process and for design guidance. Longitudinal profiles are particularly helpful in identifying knick points and knick zones and for evaluating pool riffle sequences.

Meander amplitude - The linear distance between the apex of one meander and the apex of the next meander.

Meander wavelength – The length of one complete waveform. Wavelength can be measured as the linear distance between two analogous points on a waveform.

Orientation – The overall directional aspects of a watershed superimposed upon the directional aspects of downward flow. Non-oriented patterns appear random in nature, while oriented patterns have a dominant direction that is persistent throughout the watershed.

Sediment transport competence – The condition in which the stream maintains sufficient stream power to transport the sediment supplied to it continuously through the system.

Sinuosity – The ratio of channel length to valley length. For example, a river 3,000 feet long, winding through a river valley that is 1,000 feet long has a sinuosity of 3.

Soil bioengineering – The discipline concerned with the physical properties of living plants and their application to soil stabilization. The discipline integrates biological, ecological and physical science principles into a design approach that focuses on the attainment of sustainable living systems.

Thalweg – The deepest part of a channel cross-section. The dominant thread of stream flow creates the thalweg.