

**River Restoration Toolbox
Glossary of Terms**



Iowa Department of Natural
Resources

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RIVER RESTORATION TOOLBOX GLOSSARY OF TERMS

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1.0 GLOSSARY OF TERMS

The terms included in the following glossary are commonly used by stream restoration professionals and throughout the Practice Guides included in the River Restoration Toolbox. This glossary includes general geomorphic parameters. Dimensions specific to certain techniques are described in the respective Practice Guides. These terms are defined in the context of the River Restoration Toolbox and are intended to provide a brief description for reference purposes. This list is not considered exhaustive or comprehensive.

Back of Bench: an elevation on the constructed floodplain bench farthest from the adjacent channel bankfull elevation, where the relatively flat bench slope intercepts the terrace/upland transition slope.

Bankfull: the elevation on the bank where flow begins to spill out onto the active floodplain on each side of the channel. This elevation may or may not correspond to the existing/proposed top of bank elevation. Bankfull is frequently equated with a 1 to 2-year recurrence interval.

Bankfull Depth: the mean distance from the bottom of the channel to bankfull elevation. The bankfull depth can be measured for any cross-section but for the purposes of stream classification is measured at a riffle.

Bankfull Bench: a flat area adjacent to the stream at bankfull elevation, either naturally occurring or constructed to create an area for flows above bankfull to spread out and dissipate energy.

Bedrock: stream substrate consisting of solid rock rather than mobile particles.

Capacity: the total amount of sediment a stream can transport under given flow conditions.

Competence: the ability of a stream to transport a particular size of particle, often expressed as the maximum size of sediment a stream can transport.

D₅₀/D₈₄: the particle size that 50%/84% of the samples are equal to or smaller than in a given sediment size characterization using the Wolman Pebble Count procedure.

Degradation: long-term removal of sediment occurring through increased erosion from the channel bed, causing downcutting or channel deepening (NRCS, 2007).

Entrenchment Ratio: a measure of the vertical containment of the stream defined by the ratio of flood-prone width to bankfull width (Rosgen).

Ephemeral Stream: an ephemeral stream has flowing water only during, and for a short duration after, precipitation events in a typical year. Ephemeral stream beds are located above the water table year-round. Groundwater is not a source of water for the stream (USACE).

Facet: a distinct morphological segment of a longitudinal profile (NRCS, 2007). Stream bed features, defined by the channel planform and gradient, and used to describe the channel configuration, including riffles, runs, pools, glides, and steps (Rosgen).

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Floodplain: an area of low-lying ground adjacent to a river or stream, formed mainly of sediments and subject to flooding.

Floodprone Area: the ground adjacent to the channel that is below the floodprone stage.

Floodplain Bench: an area of low-lying ground adjacent to a river or stream, constructed to allow out of bank flows in areas with limited or non-existing active floodplain.

Floodprone Elevation (Stage): the elevation determined by adding twice the maximum bankfull depth to the riffle thalweg elevation.

Headcut: an abrupt drop in the channel profile resulting from channel degradation. As the channel bed erodes and the channel downcuts, the headcut will migrate upstream.

Heavy Equipment: construction vehicles and/or equipment that require specialized training or skills to operate. State or local governments may require certification for operation of "Heavy Equipment".

Inner Berm: a bench feature present in some channels associated with the low flow elevation (Rosgen).

Intermittent Stream: an intermittent stream has flowing water during certain times of the year, when groundwater provides water for stream flow. During dry periods, intermittent streams may not have flowing water. Runoff from rainfall is a supplemental source of water for stream flow (USACE).

Low-Flow Channel: the portion of the stream channel wetted during base flow.

Low-Head Dam: a dam or weir built across a stream to pass flows from upstream over most or all of the width of the dam crest on a continual and uncontrolled basis (USACE).

Maximum Depth: the distance from the deepest part of the channel (thalweg) to the bankfull elevation.

Native Vegetation: the USDA maintains a record of native, exotic, or invasive status for plants present in the United States, available online at <https://plants.usda.gov/java/>. In addition, Iowa DNR maintains a list of plants considered invasive in the state, available at <http://www.iowadnr.gov/Conservation/Forestry/Forest-Health/Invasive-Plants>.

Near-Bank Stress: an index that rates the erosive force on the streambank, used in estimating bank erosion rates. Near bank stress is influenced by energy distribution in the stream channel and varies with cross section width and radius of curvature. Disproportionate energy distribution in the near-bank region accelerates streambank erosion.

Oxbow: a stream meander that has been partially or completely abandoned by flow due to formation of a cut off, or straighter flow path. The abandoned meander may become an oxbow lake, overflow channel, or backwater area.

Pavement: the surface particles of the stream bed or banks. Sub-pavement material is below.

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Perennial Stream: a perennial stream has flowing water year-round during a typical year. The water table is located above the stream bed for most of the year. Groundwater is the primary source of water for stream flow. Runoff from rainfall is a supplemental source of water for stream flow (USACE).

Pool: the area in a natural channel deeper and somewhat narrower than the average channel section (NRCS, 2007.)

Pool-to-Pool Spacing: The distance between the mid-point of two adjacent pools. Pool to Pool spacing can be expressed as a length, or ratio by dividing the length by the bankfull width measured as a riffle.

Protrusion: An indicator of bed roughness. Protrusion height is a measure of the height that a particle extends above the bed surface.

Reference Reach: A river or stream that exists in a state of dynamic equilibrium (maintains dimension, pattern and profile without significant aggrading or degrading (Rosgen, 1996)). The profile facets of a reference reach are also in phase with the meander pattern (i.e. pools exist at meander bends and riffles occur within the cross-over section of the channel. A reference reach should also have attributes that are favorable to replicate in a restoration project. In order to obtain sufficient data from a reference reach, the stream should exhibit favorable characteristics for a distance of 2 meander wavelengths or 20 to 30 bankfull widths.

Restoration: the manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former or degraded aquatic resource (USACE, 2017).

Riffle: the area in a natural channel that is wider and shallower than the average channel section (NRCS, 2007).

Riparian Areas: lands next to streams, lakes, and estuarine-marine shorelines, which provide a variety of ecological functions and services (USACE, 2017).

Sediment: Weathered soil and rock particles transported by water or wind.

Shear Stress: the product of energy slope, hydraulic radius, and unit weight of water. Spatial and temporal variation may result in a higher or lower point value for shear stress (NRCS, 2007).

Sinuosity: a measurement of the curvature of the stream plan form, defined by the ratio of stream length to valley length. Can also be described as the ratio of valley slope to channel slope (Rosgen, 1996).

Soil Bioengineering: the use of live and dead plant materials in combination with natural and synthetic support materials for slope stabilization, erosion reduction, and vegetative establishment (NRCS, 2007).

Stream: A natural waterway with a detectable current defined within a bed or banks. "Stream" is sometimes used interchangeably with "river" by stream restoration professionals and throughout the Practice Guides included in the River Restoration Toolbox, although the term "stream" usually implies a smaller waterway than "river".

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List of Acronyms and Abbreviations
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Stream Bed: the substrate of the stream channel between the ordinary high water marks. The substrate may be bedrock or inorganic particles that range in size from clay to boulders (USACE, 2017).

Stream Channelization: the manipulation of a stream's course, condition, capacity, or location that causes more than minimal interruption of normal stream processes (USACE, 2017). Also straightening or realignment of a stream channel.

Stream Daylighting: The process of taking a stream that is currently contained within a culvert and converting the stream into an open channel.

Stream Power: the product of shear stress and mean velocity. A measure of the available energy a stream has for moving sediment, rock, woody, or other debris (NRCS, 2007).

Structure Arm: the section of an in-stream structure that extends up from the thalweg and intercepts the bank at the bankfull elevation.

Structure Face: the downstream edge of the top of the boulder located in the thalweg of the stream on an in-stream structure.

Structure Sill: the section of the in-stream structure that starts where the structure arm intercepts the bankfull elevation at the stream bank surface and extends perpendicular to the stream bank back into and across the flood prone area.

Structure Step: the section of an in-stream structure that provides a secondary drop for streams which require additional grade control. The structure feature is used to control grade (channel stability), direct stream flow (channel bank stability); and maintain pools (in-stream habitat).

Thalweg: the "flow line" or deepest point of the channel cross section.

Terrace or Upland: the surrounding topography, which is above the floodprone stage. A terrace is an abandoned floodplain, which is presently above floodprone stage due to incision or downcutting.

Top of Bank: the channel bank slope break point at which the existing and/or proposed channel cross section intercepts the adjacent ground/floodplain.

Width/Depth Ratio: the ratio of the bankfull surface width to the mean depth of the bankfull channel as measured at a cross-section (Rosgen, 1996). The width/depth ratio can be measured for any cross-section but for the purposes of stream classification is measured at a riffle.

2.0 LIST OF ACRONYMS AND ABBREVIATIONS

BKF	Bankfull
d_{BKF}	Bankfull Depth
d_{MAX}	Maximum Depth, measured at riffle

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References

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ER	Entrenchment Ratio
IDNR	Iowa Department of Natural Resources
NAVD	North American Vertical Datum
USACE	United States Army Corps of Engineers
W_{BKF}	Bankfull Width
w/d	Width to Depth Ratio

3.0 REFERENCES

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