

# GLOSSARY

## A

### Aggradation

To fill and raise the level of the bed of a stream by deposition of sediment.

### Alluvial

Soil deposited by running water.

### Anadromous

Fish that leave freshwater and migrate to the ocean to grow and mature. They return to freshwater to spawn.

### Aquatic Ecosystem

The stream channel, lake or estuary bed, water, biotic communities, and the physical, chemical, and biological features that occur therein forming a system that interacts with associated terrestrial ecosystems.

### Aquifer

A water-bearing rock or rock formation.

### Armoring

(a) The natural process of forming an erosion-resistant layer of relatively large particles on the surface of the streambed. (b) The artificial application of various materials to strengthen streambanks against erosion. (See also Revetment.)

## B

### Bank Failure

Collapse of a mass of bank material.

### Bankfull

Natural streams—The discharge that fills the channel without overflowing onto the floodplain.

### Bankfull Discharge

The bankfull stage corresponds to the discharge at which channel maintenance is most effective. That is, the discharge at which moving sediment, forming or removing bars, forming or changing bends and meanders, and generally doing work that results in the average morphologic characteristics of channels. (Leopold 1979 as quoted in Rosgen 1996, p. 2-3).

## Bar

A streambed deposit of sand or gravel, often exposed during low-water periods. An alluvial deposit composed of sand, gravel, or other material that obstructs flow and induces deposition or transport.

### Basal or Butt End

The bottom end or end nearest the trunk of a cutting taken from a riparian plant that will root if planted face down in the soil (opposite the budding tip's end of the cutting).

### Bedload

The part of the total stream load that is moved on or immediately above the stream bed, such as the larger or heavier particles (boulders, pebbles, gravel) transported by traction or saltation (discontinuous movement) along the bottom; the part of the load that is not continuously in suspension or solution.

### Bend

A change in the direction of a stream channel in plan view.

### Benthic

Of or pertaining to animals and plants living on or within the substrate of a water body.

**Bioengineering**—see Soil Bioengineering.

### Biomass

The total mass or amount of living organisms in a particular area or volume.

### Bog

Waterlogged ground or marshland (also known as a wetland).

### Bole

Trunk of a tree.

### Boulder

A streambed substrate particle greater than 10 in. in its longest dimension.

### Braided

A stream that forms an interlacing network of branching and recombining channels separated by branch islands or channel bars.

**Branch Packing**

Live woody branch cuttings and compacted soil used to repair slumped areas of streambanks.

**Brush Layer**

Live branch cuttings laid in crisscrossed fashion on benches between successive lifts of soil.

**Brush Mattress**

A combination of live stakes, fascines, and live branch cuttings installed to cover and protect streambanks and shorelines.

**Buffer**

A vegetated area of grass, shrubs, or trees designed to capture and filter runoff from surrounding land uses.

**C**

**Canopy**—see Cover.

The overhead branches and leaves of riparian vegetation.

**Canopy Cover**

Vegetation projecting over a stream, including crown cover (generally more than 3 ft. above the water surface) and overhang cover (less than 3 ft. above the water surface).

**Caving**

The collapse of a streambank by undercutting due to wearing away of the toe or an erodible soil layer above the toe.

**Channel**

A stream, river, or artificial waterway that periodically or continuously contains moving water. It has a definite bed and banks that confine the water.

**Community**

Any assemblage of populations of plants and/or animals in a common special arrangement.

**Community Type**

An aggregation of all plant communities distinguished by floristic and structural similarities in both overstory and undergrowth layers. A unit of vegetation within a classification.

**Cover**

Anything that provides protection for fish and/or wildlife from predators or ameliorates adverse conditions of stream flow and/or seasonal changes in metabolic costs. May be instream structures such as rocks or logs, turbulence, and/or overhead vegetation. Anything that provides areas for escape, feeding, hiding, or resting.

**Cut Off**

A channel cut across the neck of a bend, eliminating the bend.

**D****Dead Blow Hammer**

A hammer filled with lead shot or sand.

**Deadman**

A log, timber, block of concrete, or pipe buried in a streambank that is used to anchor a revetment with cable or chain.

**Dead Stout Stakes**

Stakes, made from 2- by 4-in. lumber used to hold erosion control fabric, fascines, and brush mattresses, and so on, in place.

**Debris**

Any material, organic or inorganic, floating or submerged, moved by a flowing stream.

**Decomposition**

The separation of organic or chemical matter.

**Degradation**

The long-term hydraulic process by which stream and riverbeds lower in elevation. It is the opposite of aggradation.

**Deposition**

The settlement of materials out of moving water and onto the channel bed, banks, and floodplains that occurs when the flowing water is unable to transport the sediment load.

**Discharge**

The volume of water passing through a section of channel during a specified period of time, which is usually measured in cubic feet per second (cfs) or cubic meters per second (m<sup>3</sup>/sec).

**Diversity**

The distribution and abundance of different plant and animal communities.

**Duckbill Anchor**

A short piece of steel tube, pointed at one end. A steel cable is attached to the tube halfway down its length. The duckbill is driven into the soil to the desired depth. Pulling up on the attached cable rotates the bill, making it somewhat parallel to the surface and setting the anchor.

**Duff**

A spongy layer of decaying leaves, branches, and other organic materials covering the forest floor.

**E****Ecosystem**

An ecological community considered together with nonliving factors of its environment as an environmental unit.

**Ecosystem Element**

An identifiable component, process, or condition of an ecosystem.

**Ecosystem Function**

(a) The process through which the constituent living and nonliving elements of ecosystems change and interact, including biogeochemical processes and succession. (b) A role of an ecosystem that is of value to society.

**Ecotone**

A relatively narrow overlap zone between two ecological communities.

**Erosion**

In the general sense, the wearing away of the land by wind and water. As used in this document, the removal of soil particles from a bank primarily by water action.

**Erosion Control Fabric**

Woven or spun material made from natural or synthetic fibers and placed to prevent surface erosion.

**Evapotranspiration**

The processes by which plants take in water through their roots and then give it off through their leaves as a byproduct of respiration.

**F**

**Fascine**—see Live Fascine.

**Failure**

Collapse or slippage of a large mass of bank material into a stream.

**Fetch**

The open area and distance across a body of water in which wind can exert energy on waves to increase their strength of impact on the shoreline.

**Fill Material**

Soil that is placed at a specified location to bring the ground surface up to a desired elevation or angle of slope.

**Fines**

Silt and clay particles.

**Fish Habitat**

The aquatic environment and the immediately surrounding terrestrial environment that meet the necessary biological and physical requirements of fish species during various life stages.

**Floodplain**

Any lowland that borders a stream and is inundated periodically by its waters.

**Footer Log**

A log placed below the expected scour depth of a stream. A foundation for a root wad or log revetment.

**G****Geomorphology**

The geologic study of the characteristics, origin, and development of landforms.

**Goal**

The desired state or condition that a resource management policy or program is designed to achieve.

**Grade**

The individual profile and pattern that a river has developed to efficiently move the discharge and sediment delivered to it.

**Ground Water**

Water contained in the voids of the saturated zone of geologic strata (the open spaces between the individual soil particles are filled with water). Above the ground water table and below the ground surface, water in the soil does not fill all the pores.

**H****Habitat**

A place where a biological organism lives. The organic and nonorganic surroundings that provide life requirements such as food and shelter.

**Headcut**

The development and upstream movement of a vertical or near vertical change in bed slope, generally evident as falls or rapids. Headcuts are often an indication of major disturbances in a stream system or watershed. (See also Nick Point.)

**Headwaters**

The uppermost reaches of a stream or river.

**Horton Overland Flow**

"Horton overland flow is shallow, sheetlike, and locally of very high velocity as it moves across the landscape... It is extremely effective at eroding loose soil and even bedrock." (Mount 1995, p. 92).

**Hydrology**

The study of the occurrence, circulation, properties, and distribution of water and its atmosphere.

**I****Incised Channel**

A stream that through degradation has cut its channel into the bed of the valley.

**Infiltration**

That portion of rainfall or surface runoff that moves downward into the subsurface rock and soil.

**Intermittent Stream**

A stream that has interrupted flow or does not flow continuously.

**Joint Planting**

The insertion of live stakes in the spaces or joints, between previously placed rock riprap. When placed properly, the cuttings are capable of rooting and growing.

**K****Keyed in**

Refers to tying the ends of a structure into the bank to prevent water from going behind it.

**L****Large Woody Debris**

Any large pieces of woody material that intrude or are embedded in the stream channel, several inches in diameter and equal to or greater in length than the average bankfull width.

**Lifts**

Layers of loose soil wrapped in erosion control fabric used to rebuild and recontour a bank.

**Littoral Shelf**

The sedimentary material on shorelines formed by waves and currents.

**Littoral Transport**

The movement of sedimentary, either parallel (long-shore transport) or perpendicular (on-shore transport), to the shoreline.

**Live Branch Cuttings**

Living, freshly cut branches from woody shrub and tree species that readily propagate when embedded in soil.

**Live Cribwall**

A rectangular framework of logs or timbers constructed with layers of live plant cuttings that are capable of rooting.

**Live Fascine**

Bound, elongated, cylindrical bundles (6 to 8 in. in diameter) of live branch cuttings used to stabilize streambanks that are placed in shallow trenches, partly covered with soil, and staked in place, also referred to as wattle.

**Live Siltation**

Live branch cuttings that are placed in trenches at an angle from shoreline to trap sediment and protect the shore against wave action.

**Live Stake**

Live branch cuttings that are tamped or inserted into the earth to take root and produce vegetative growth.

**M****Macro Invertebrates**

An invertebrate animal (without backbone) large enough to see without magnification.

**Meander**

A circuitous winding or bend in the river.

**Morphology**

Science of structure of organisms. River morphology deals with the science of analyzing the structural makeup of rivers and streams.

**N****Nick Point**

The point where the stream is actively eroding the streambed to a new base level. Nick points migrate upstream. (See also Headcut.)

**O****Ordinary High-Water (OHW) Mark**

The mark along a streambank where the waters are common and usual. This mark is generally recognized by the difference in the character of the vegetation above and below the mark or the absence of vegetation below the mark. (See Bankfull Discharge)

**Oxbow**

A loop or bend in the river that is cut off from the main channel.

**P****Perennial Stream**

A stream that flows continuously throughout the year.

**Point Bar**

A gravel or sand deposit on the inside of a river bend; an actively mobile river feature.

**Pollutant**

Something that is harmful, destructive, or deadly.

**Pool**

A topographical low in the stream that is produced by scour that generally contains fine-grained sediments.

**Proper Functioning Condition**

The functioning condition of riparian-wetland areas is a result of interaction among geology, soil, water, and vegetation. Riparian-wetland areas are functioning properly when adequate vegetation is present to dissipate stream energy associated with high-water flows, thereby reducing erosion and improving water quality; filter sediment and aid floodplain development; improve floodwater retention and ground water recharge; develop root masses that stabilize streambanks against cutting action; develop diverse ponding and channel characteristics to provide the habitat and the water depth, duration, and temperature necessary for fish production, waterfowl, breeding, and other uses; and support greater biodiversity. (USDI 1998)

**R****Reach**

A length of stream that has generally similar physical and biological characteristics.

**Rebar**

Steel reinforcement bar used primarily for reinforcing concrete. It has a variety of uses in restoration work.

**Revetment**

A facing of stone, wood, or other natural materials placed on a bank as protection against wave action and currents.

**Riffle**

A topographical high area in a channel created by the accumulation of relatively coarse-grained sediment. Completely or partially submerged obstructions produce surface agitation.

**Rill Erosion**

Removal of soil particles from a bank slope by surface runoff moving through relatively small narrow channels.

**Riparian Vegetation**

Vegetation growing along banks of streams, rivers, and other water bodies tolerant to or more dependent on water than plants further upslope.

**Riprap**

A layer, facing, or protective mound of rubble or stones randomly placed to prevent erosion, scour, or sloughing of a structure or embankment; also, the stone used for this purpose.

**Root Wad**

A short length of tree trunk with a root mass.

**Run**

The straight fast-moving section of a stream between riffles.

**S****Salmonids**

Fish of the family Salmonidae, including salmon, trout, char, whitefish, ciscoe, and grayling.

**Scour**

Concentrated erosive action of flowing water in streams that removes and carries away material from the bed and banks.

**Sediment**

Soil particles that have been transported and/or deposited by wind or water action.

**Sediment Load**

The sediment transported through a channel by stream flow.

**Seral**

Successional sequence of plants in a specific plant community. Stage of plant development from pioneer to climax.

**Shear Strength**

The internal resistance of a body to shear stress. Typically includes frictional and cohesive components. Expresses the ability of soil to resist sliding.

**Shear Stress**

The force per unit area tending to deform a material in the direction of flow. The pull on a bank that may cause it to slide.

**Silt**

Slightly cohesive to noncohesive soil composed of particles that are finer than sand but coarser than clay; commonly in the range of 0.004 to 0.0625 mm, silt will crumble when rolled into a ball.

**Sinuosity**

A measure of the amount of a river's meandering; the ratio of the river channel length to the valley length. A straight channel has a sinuosity of 1.0; a fully meandering river has a sinuosity of 2.0 or greater.

**Slope**

The amount of vertical rise divided by the horizontal run.

**Slough**

An inlet or backwater, sometimes an alternate branch of a river.

**Sloughing**

The downward slipping of a mass of soil, moving as a unit usually with backward rotation, down a bank. Also called sloughing off or slumping. Sloughing is similar to a landslide.

**Soil Bioengineering**

An applied science that combines structural, biological, and ecological concepts to construct living structures for erosion, sediment, and flood control. It is always based on sound engineering practices integrated with ecological principles.

**Stream Channel**

A body of running water moving over the Earth's surface in a channel or bed (also river).

**Streambank**

The side slopes of a channel between which the stream flow is normally confined.

**Streambank Failure**

Collapse or slippage of a large mass of bank material into the channel caused by hydraulic or geotechnical modes, or a combination of both.

**Streambed**

The bottom of a channel.

**Stream Flow**

The movement of water through a channel.

**Stream Reach**

A portion of a stream that is relatively homogeneous based on geomorphology, stream form, geology, and sinuosity.

**Stream Order**

Designation of stream segments within a drainage basin. The smallest perennial tributary is designated as order 1, the junction of two first-order streams produces a stream segment of order 2; first-order streams can flow into an order 3 stream or larger order river. Intermittent streams are order 0.

The designations (1, 2, 3) of the relative position of stream segments in a drainage basin network: the smallest, unbranched, perennial tributaries, terminating at an outer point, are designated order 1; the junction of two first-order streams produces a stream segment of order 2; the junction of the second-order streams produces a stream of order 3, and so on. A lower order stream can merge with a larger order river, order 5.

**Stream Power**

Measure of energy available to move sediment, or any other particle in a stream channel. It is affected by discharge and slope.

**Structure**

The spatial arrangement of the living and nonliving elements of an ecosystem.

**Surface Runoff**

That portion of precipitation that moves over the ground toward a lower elevation and does not infiltrate the soil.

**Suspended Load**

The part of the total sediment load that is carried by the water for a considerable period of time at the velocity of the flow, free from contact with the streambed. (See also Bedload.)

**Sustainability**

The ability of an ecosystem to maintain ecological processes and functions, biological diversity, and productivity over time.

**T****Thalweg**

A line following the deepest part of the bed or channel of a stream.

**Tied In**

An expression used to indicate that a technique is constructed to prevent stream flow between the structure and the bank. (See Keyed In.)

**Toe**

The break in slope at the foot of a streambank where it meets the streambed.

**Top of Bank**

The break in slope between the streambank and the surrounding upland terrain.

**U****Undercut Bank/Cut Bank**

The steep or overhanging slope on the outside of a meander curve, typically produced by lateral erosion of the stream. For all undercut banks, a protrusion of the upper portion of the bank overhangs the water surface at a flow equal to or less than bankfull.

**Unstable Bank**

The streambank shows evidence of active erosion, shearing, tension cracking, breakdown, and/or sloughing. Undercut banks are considered unstable if tension cracks show on the ground surface at the back of the undercut.

**V****Vegetated Geogrid**

Live branch cuttings placed in layers with soil lifts wrapped in erosion control fabric.

**Velocity (of water in a stream)**

The distance that water can travel in a specific direction during an interval of time. Usually expressed in feet per second (fps).

**Vernal Pool**

A small depression, with a hard-panned floor, whose depth fluctuates with the seasons and rain patterns. It is dry for a part of the year. Vegetation within and adjacent to the pool is unique.

**W****Wash**

A dry streambed. Usually found in the West.

**Watershed**

An area of land surface defined by a topographic divide that collects precipitation into a stream. Sometimes referred to as a drainage basin.

**Wattle**—see Live Fascine.

**Wetland**

An area of land that is saturated at least a part of the year by water. Usually found in depressions, low-lying areas, or along floodplain or coastal areas.

**Woody Debris**

Coarse wood material such as twigs, branches, logs, trees, and roots that fall into streams.



## ADDITIONAL INFORMATION

### San Dimas Technology and Development Center

<http://fsweb.sdt dc.wo.fs.fed.us/>

Dexter Meadows: 909-599-1267, ext. 276;

[dmeadows@fs.fed.us](mailto:dmeadows@fs.fed.us)

Ellen Eubanks: 909-599-1267, ext. 225; [eeubanks@fs.fed.us](mailto:eeubanks@fs.fed.us)

### Rocky Mountain Research Station

Stream Systems Technology Center

<http://www.stream.fs.fed.us>

Larry Schmidt: 970-295-5984; [lschmidt@fs.fed.us](mailto:lschmidt@fs.fed.us)

The Web site lists conferences and other pertinent information. The center also publishes a hydrology newsletter—*Stream Notes*.

### Pacific Southwest Research Station

<http://www.rfl.psw.fs.fed.us/recreaton/index.html>

### Northeastern Research Station

<http://fsweb.fs.fed.us/ne/home/publications>

### U.S. Army Corps of Engineers

<http://www.wes.army.mil/el/nrrdc/courses.html>

Waterways Experiment Station, MS

Hollis Allen: 601-634-3845; [allenh@wes.army.mil](mailto:allenh@wes.army.mil)

Craig Fischenich: 601-634-3449; [fischec@wes.army.mil](mailto:fischec@wes.army.mil)

The Web site lists U.S. Army Corps of Engineers training opportunities.

### Federal Interagency Stream Corridor Restoration Working Group

[http://www.usda.gov/stream\\_restoration](http://www.usda.gov/stream_restoration)

Developed as a cooperative effort between numerous agencies, *Stream Corridor Restoration: Principles, Processes, and Practices* provides a comprehensive discussion of the processes and procedures of setting up a restoration or revegetation plan. If there is a lot of riparian work to do, this is a must have publication. It is a large Adobe Acrobat file that can be downloaded and viewed on any computer, but will take some time to load. A hard copy or CD-ROM can also be ordered.

### Natural Resources Conservation Service

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The following publications and information are available at NRCS Web sites.

#### Bioengineering Engineering Drawings

<http://www.wcc.nrcs.usda.gov/wtec/soilbio.html>

<http://www.wcc.nrcs.usda.gov/wtec/revetments.html>

<http://www.wcc.nrcs.usda.gov/wtec/instream.html>

These are technical drawings that were done by the former Western National Technical Center of NRCS. Detailed and downloadable GIF pictures, specifications, details, and applications are still being maintained in the Watershed Technology Electronic Catalog on the National Water and Climate Center Web site.

#### Plant Materials Program Information

<http://Plant-Materials.nrcs.usda.gov>

This site lists all the plant materials centers in the United States. It will let you go to each center to see what each of their research emphases are, what publications they have produced, cultivars for which they are responsible, and other information on their individual programs.

#### Publications from Plant Materials Center at Aberdeen, ID

<http://Plant-Materials.nrcs.usda.gov/idpmc>

The site includes the following publications:

#### **The Practical Streambank Bioengineering Guide**

The bioengineering guide contains four files written in Adobe Acrobat that can be downloaded and viewed on any computer. Adobe Acrobat Reader 3.0+ is needed to view the files. If Adobe Acrobat is not on the computer, a link is provided to Adobe where it can be downloaded for free.

#### **Riparian/Wetland Project Information Series and Tech Notes**

The riparian/wetland project has produced a number of short technical papers on riparian and wetland issues. These are written in a user-friendly style to allow the reader to understand a wide variety of issues related to riparian and wetland plants, and techniques for planting, community establishment, maintenance, and propagation. They are in Adobe Acrobat format.

**Miscellaneous Popular Articles**, including Waterjet Stinger: a tool to plant dormant unrooted cuttings of willows, cottonwoods, dogwoods, and other species. Hoag, et al. 2001.

## Environmental Protection Agency

<http://www.epa.gov/epahome/search.html>

This site allow you to type in a topic and lists documents and other sites.

<http://www.epa.gov/OWOW/watershed/wacademy/catalog.html>

This site lists a variety of training opportunities offered by Federal, State, and local agencies and by private industry.

## Society for Ecological Restoration

<http://www.ser.org>