

**APPENDIX B
GLOSSARY**

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Acronyms

Here is a list of the “alphabet soup” of agencies, laws, programs, and materials that may need translation.

ABAG	Association of Bay Area Governments
AC	Asphalt – concrete
ACOE	Army Corps of Engineers
BA	Biological Assessment (under ESA)
BASMAA	Bay Area Stormwater Management Agencies Association
BCDC	Bay Conservation and Development Commission
BLM	Bureau of Land Management
BMP	Best Management Practice
BO	Biological Opinion (under ESA)
CAL-EPA	California Environmental Protection Agency
CCC	California Coastal Commission
CCCESU	Central California Coast Evolutionary Significant Unit
CDF	California Dept. of Forestry and Fire Protection
CDP	Coastal Development Permit
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
CMA	Calcium Magnesium Acetate (for ice control)
CMP	Corrugated Metal Pipe culvert
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
DFG	California Dept. of Fish and Game
DOT	Department of Transportation (county, state or federal)
DRC	Ditch Relief Culvert
EIR	Environmental Impact Report (under State CEQA)
EIS	Environmental Impact Statement (under Federal NEPA)
EPA	U.S. Environmental Protection Agency
ERFO	Emergency Relief for Federally Owned Roads
ESA	Endangered Species Act
ESU	Evolutionarily Significant Unit
FHWA	Federal Highway Administration
HBRR	Highway Bridge Rehabilitation or Replacement
HCP	Habitat Conservation Plan
LCP	Local Coastal Plan
LOP	Limited Operating Period
LWD	Large Woody Debris
NFPA	National Fire Protection Association
NMFS	National Marine Fisheries Service (former name for NOAA Fisheries)
NOAA	National Oceanic and Atmospheric Administration

NOAA FISHERIES-	The branch of NOAA responsible for fisheries protection and restoration
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resource Conservation Service
NWP	Nationwide General Permit (under CWA)
ODOT	Oregon Dept. of Transportation
RCD	Resource Conservation District
RGP	Regional General Permit (under CWA)
RWQCB	Regional Water Quality Control Board
SHPO	State Historic Preservation Office
SLC	State Lands Commission
SMARA	Surface Mining and Reclamation Act (California)
SPCC	Spill Prevention Control and Countermeasure plan
STIP	State Transportation Improvement Project
SWP	Storm Water Permit
SWRCB	State Water Resources Control Board
TMDL	Total Maximum Daily Load (under Clean Water Act)
USA	Underground Service Alert
USACE	U.S. Army Corps of Engineers (see COE)
USDOT	U.S Dept. of Transportation
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
WDR	Waste Discharge Requirements

Definition of Terms

Abandoned road – A road which is no longer maintained. An abandoned road may or may not still be driveable and may or may not be overgrown with vegetation. [See also *Road abandonment*.]

Accelerated erosion – Erosion that has been caused directly or indirectly by human activities or land management. Typically thought of as erosion which is not “natural” or that which is in excess of that which would have naturally occurred.

Active channel width - See *Ordinary High Water Mark*. Term used by California DFG in its “Culvert Criteria for Fish Passage”.

Active road – A road that is part of the overall road network that needs to be actively inspected and maintained.

Adaptive management – Learning from experience by adapting management practices through the feedback received through monitoring.

Alevin – A juvenile salmonid fish in the early phase, recently emerging from the egg and still carrying a yolk sac.

Anadromous fish – (“*a-nad’-ro-mus*” ; to run upward) - fish that are born and rear in freshwater, move to the ocean to grow and mature, and return to freshwater to reproduce. Salmon, steelhead, and lamprey eel are examples.

Angle of repose – The steepest slope angle at which a material will freely stand without failing or sliding downslope. For material without cohesion, such as sand, the angle is about 33 degrees. It is steeper for cohesive materials. Slopes which are steeper than the angle of repose are likely to be unstable.

Armoring – Protective coverings or structures used to dissipate the erosive energy of water. Aprons and rip-rap are types of armoring.

Bankfull discharge – The stream discharge that just fills the stream to its banks, and which usually occurs approximately every two years on average.

Bearing surface – The driving surface of the road. Road rocking is a common method of increasing the load bearing capacity of the road surface if the subgrade soils are relatively weak.

Berm – A curb or dike constructed to control water and prevent roadway runoff waters from discharging onto roadside slopes and/or to provide material for subsequent road maintenance.

Best Management Practices (BMPs) – A technique, or series of techniques, which is the best known practice available to be effective in protecting water quality and stream habitat.

Borrow site – Locations on the landscape where sand, gravel, and/or rock is excavated for use in road construction activities elsewhere in the watershed.

Buffer strip – An area or strip of land adjacent to a stream containing relatively undisturbed vegetation that acts as a filter or buffer for erosion and runoff from upslope roads or other land management activities.

Check dam (straw bale) – A temporary structure used to contain eroded soil from leaving a disturbed or construction site. Straw bale dams quickly decompose and will usually not provide sediment storage or protection for more than a single season.

Chinook salmon – An anadromous fish species also known as “king salmon”.

CMP – Corrugated metal pipe culvert, often used synonymously with culvert. Metal culverts are typically made from galvanized steel or aluminum.

Coho salmon – An anadromous fish species also known as “silver salmon”.

Controllable – Erosion that would reasonably respond to cost-effective mitigation.

Cross-drain – A culvert, rolling dip, water bar, or outslope area that drains water across a road from an inboard ditch or water collection area. Cross-road drains are more substantial and deeper than conventional waterbars used to drain forest and ranch roads, and are steeper and more abrupt than rolling dips. Well constructed cross-drains will often be deep enough to prevent vehicular access to an area and are typically installed on roads which are being closed permanently or for several years. Cross-road drains are typically constructed (excavated) using a tractor, an hydraulic excavator, or a backhoe.

Culvert – A transverse drain, usually a metal pipe, set beneath the road surface which drains water from the inside of the road to the outside of the road. Culverts are used to drain ditches, springs, and streams across the road alignment.

Cutslope (cutbank) – The artificial face or slope cut into soils or rock along the inside of a road.

Danger tree – Trees or snags, on or near the highway, that are found to be weakened, unsound, undermined, leaning, or exposed so they may fall across the road. When permission to remove the trees cannot be obtained, it is necessary to trim and do whatever else is reasonable to alleviate the hazard.

Debris flow – A rapidly moving mass of rock fragments, soil and mud, with more than half of the particles being larger than sand size. In contrast to debris slides, debris flows are usually saturated with water.

Debris slide – A slow to rapid slide, involving downslope translation of relatively dry and predominantly unconsolidated materials, with more than half of the particles being larger than sand size.

Debris torrent – Rapid movement of a large quantity of materials (wood and sediment) down a stream channel during storms or floods. This action generally occurs in smaller, steep stream channels and results in scouring of the streambed.

Dewatering – The temporary diversion of water away from a work site to protect water quality and allow progression of work. Diversion is accomplished with coffer dams, pipes, or other means. Water is removed from the work site only, and not the entire stream or body of water.

Ditch relief culvert – A drainage structure or facility which will move water from an inside road ditch to an outside area, beyond the outer edge of the road fill.

Diversion potential - Road stream crossing that has the potential to divert flow from a plugged culvert down the length of the road surface, rather than directly across the culvert fill and into its natural drainage channel. This potential carries the risk of causing soil erosion and sediment delivery.

Downspout – A flume or trough attached to a culvert outlet to transport water beyond the erosive road fill to a stable, armored catchment area in order to prevent erosion. Culverts that are placed at the base of the road fill discharge directly into the natural channel or hillslope and usually do not require a downspout.

Drainage basin – See: *Watershed*.

Drainage structure – A structure installed to control, divert or to cross over water, including but not limited to culverts, bridges, ditch drains, fords, waterbreaks, outsloping, and rolling dips.

Drop inlet – A vertical riser on a culvert inlet, usually of the same diameter as the culvert, and often slotted to allow water to flow into the culvert as streamflow rises around the outside. Drop inlets are often used on stream or ditch relief culverts where sediment or debris would otherwise threaten to plug a traditional horizontal inlet.

Emergency – “A situation which would result in an unacceptable hazard to life, a significant loss of property, or an immediate, unforeseen, and significant economic hardship if corrective action requiring a permit is not undertaken within a time period less than the normal time needed to process the application under standard.” (COE Regulations); “A situation involving an act of God, disasters, casualties, national defense or security emergencies, etc., and includes response activities that must be taken to prevent imminent loss of human life or property.” (ESA rules, 50 CFR 402.05); “A sudden, unexpected occurrence, involving a clear and imminent danger, demanding immediate action to prevent or mitigate loss of, or damage to, life, health, property or essential public services. Emergency includes such occurrences as fire, flood, earthquake, or other soil or geologic movements, as well as such occurrences as riot, accident, or sabotage.” (CEQA 15359).

Emergency road maintenance – See: *Storm maintenance*.

Endangered Species – Any species which is in danger of extinction throughout all or a significant portion of its range; an official designation of the California and/or Federal Endangered Species Acts.

Endhauling – The removal and transportation of excavated material to prevent sidecast, and the storage of the material in a stable location where it cannot enter stream channels. Endhauling is usually accomplished using dump trucks, but on larger jobs may be performed by mobile scrapers.

Energy dissipator – A device or material (often rocks) used to reduce the energy of flowing water, typically used at and below culvert outlets and other drainage structures to prevent erosion.

Ephemeral streams - Streams that contain running water only sporadically, such as during and following storm events.

Equipment limitation / equipment exclusion – The terms used when the use of heavy equipment is to be limited or prohibited, respectively, for the protection of water quality, the beneficial uses of water, or aquatic habitat.

Erodible soils – Soils which are relatively prone to erosion by rain drop impact and surface runoff. Granular, noncohesive soils (such as soils derived from sand dunes or from decomposed granite (DG)) are known to be especially erodible.

Erosion – The wearing away of land surface primarily by wind or water. Erosion occurs naturally as a result of weather or runoff, but can be intensified by clearing, grading, or excavation of the land surface. Erosion usually refers to processes of surface erosion (rain drop erosion, rilling, gullyng, and ravelling) and not to mass soil movement (landsliding).

Erosion control - The act of controlling on-going erosion caused by rain drop impact, rilling, gullyng, ravelling, and other surface processes.

Erosion prevention – Preventing erosion before it has occurred. Erosion prevention is typically less expensive and more effective than erosion control.

Erosion-proof – The act of performing erosion control and erosion prevention activities which will protect a road, including its drainage structures and fills, from serious erosion during a large storm and flood.

Excess material – See *Spoil*.

Fail-safe – A term used to describe a stream crossing that has no diversion potential.

Fail soft – A fail-safe stream crossing where the dip or change in road grade occurs over the hinge line between the fill and the natural ground surface. With the road dip or low point in this location, overflow from a plugged culvert will likely result in the least possible amount of erosion. Roads which dip deeply as they cross a stream channel have smaller fills which can be eroded when culvert plugging occurs.

Fillslope – That part of a road fill between the outside edge of the road and the base of the fill, where it meets the natural ground surface.

Fill – The material that is placed in low areas, compacted, and built up to form the roadbed surface.

Filter fabric (geotextile) – A synthetic fabric manufactured and designed for use in, among others, subsurface and surface drainage applications. Filter fabric is especially useful in maintaining a separation between coarse aggregate and finer native soil particles. It comes in a number of different types (with different specifications and uses) and is used in a number of different road building settings. Manufacturer's specifications should always be consulted before using a fabric for drainage or other engineering applications.

Filter strip – See *Buffer*.

Filter windrow – A row of slash and woody debris laid and pressed down along the base of a road fill or sidecast slope to contain soil eroded from the hillslope. Filter windrows are often used to contain erosion from fillslopes and sidecast areas where a road approaches and crosses a stream channel.

Flared inlet – A culvert inlet which is flared or widened to increase its capacity and reduce the chance of inlet plugging and damage. Mitred inlets, usually made by cutting a normal culvert at an angle, are also used on ditch relief culverts to decrease inlet erosion and improve culvert efficiency. Flared inlets are attached to the normal culvert inlet using a band or bolts.

Floodplain – The land area that is covered by water from the overflow of stream channels when their banks are full. The ‘100-year floodplain’ represents the area potentially inundated for an unusual but possible flood event with the probability of occurring once every 100 years on the average.

Fluvial geomorphology – the study of water-shaped landforms. See also *Geomorphology*.

Ford (wet) – A rock, concrete or other hardened structure built on the bed of a live stream which allows vehicle passage during low flow periods.

Ford (dry) - A rock, concrete or other hardened structure built on the bed of a swale, gully or usually dry stream which allows vehicle passage during periods of low or no flow.

French drain – A trench with covered drain rock used to provide subsurface ground water transport from a wet area and discharge it in a safe and stable location. French drains are often lined with filter fabric to keep soil from plugging the drain.

Fry – A juvenile salmonid fish, between the alevin and the smolt phase, in fresh water.

Full bench road – Road construction technique where the road bench cut width equals the road running surface width and no fill is used.

Full fill road – Road construction technique in which no bench cut is made into the hillslope and the road prism is made entirely from imported fill. The ground surface must still be prepared (grubbed and bared) for the fill to bind to the underlying substrate.

Geomorphology - the study of the physical features of the surface of the earth, including their form, nature, origin, and development. See also *Fluvial geomorphology*.

Geotextile – See *Filter fabric*.

Grade-break – The location of a reversal in the slope (grade) of the road from climbing to falling, or from falling to climbing.

Grading – The act of excavating and moving soil along the road alignment to an established grade-line during road construction or reconstruction. Grading also refers to the mechanical smoothing of the road bed to maintain a free-draining, smooth traveling surface.

Ground cover – Matter that covers the soil surface, such as low growing plants, rock and rock fragments, and debris such as leaves and twigs.

Groundwater – The standing body of water beneath the surface of the ground, consisting largely of surface water that has seeped down into the earth.

Gully – An erosion channel formed by concentrated surface runoff which generally has a cross sectional area larger than one square foot (1’ deep by 1’ wide). Gullies often form where road surface or ditch runoff is directed onto unprotected slopes.

Habitat – The place where a plant or animal (including fish and other aquatic life) naturally or normally lives and grows.

Hazard Tree - Trees or snags on or near the highway that are found to be weakened, unsound, undermined, leaning, or exposed so they may fall across the highway, impair sight while driving, or damage structures.

Hazardous waste - A waste, or combination of wastes, which because of its quantity, concentration, or physical, chemical or infectious characteristics, may either cause or significantly contribute to an increase in serious irreversible illness, or pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of, or otherwise managed. Possesses at least one of four characteristics (ignitability, corrosivity, reactivity, or toxicity), or appears on special EPA or state lists. Regulated under the federal Resource Conservation and Recovery Act and the California Health and Safety Code.

Headcut – The vertical break in slope at the uphill end (head) of a gully. Headcuts migrate uphill and elongate the gully.

Headwater swale – The swale or dip in the natural topography that is upslope from a stream, at its headwaters. There may or may not be any evidence of overland or surface flow of water in the headwater swale.

Hillslope – Sediment erosion site associated with areas above the riparian area.

Horizontal drains – Drains installed in cut slopes and beneath fills to remove subsurface water and guard against slides in problem areas. Typically, they consist of perforated metal or plastic pipes in drill holes that have been bored horizontally into the aquifer or water-bearing formation.

Hydrological connectivity – Degree to which water from a source site or unstable area is conveyed to the network of the natural watercourse of concern.

Hydrologically connected road - Any road segment that, during a design runoff event, has a continuous surface flowpath between any part of the road prism and a natural stream channel..

Hydro-seeding (hydraulic seeding) – An erosion control technique for applying a slurry of seed, fertilizer and mulch by hydraulically spraying the mixture on the ground surface. Hydro-seeding is typically performed on slopes that are too steep for dry seeding.

Impaired- The term used by the EPA and Regional Water Quality Control Boards to designate streams with water quality impacts such as high temperatures, levels of sediment, or other chemical pollutants. If a stream is officially listed as *impaired* under the CWA 303(d) listing, it triggers a requirement for TMDL (Total Maximum Daily Load) non-point source pollution limits to be set for that stream.

Inactive road – A road needed only infrequently, for fire control or other intermittent management activities. These roads remain largely unused for most of the year, or for several years in succession, but have drainage structures intact and require regular inspection and maintenance.

Inboard ditch – The drainage ditch on the inside of the road, usually at the foot of a cutbank.

Infiltration – The movement of water through the soil surface of the soil.

Inner gorge – A stream reach bounded by steep valley walls that terminate upslope into a more gently topography. Common in areas of rapid stream downcutting or uplift.

Insloped road – Road surface that is sloped in toward the cutbank. Insloped roads usually have an inboard ditch that collects runoff from the road surface and cutbank.

Intermittent stream – Any nonpermanent flowing drainage feature having a definable channel and evidence of scour and deposition. Intermittent streams flow in response to rainfall, and then for some period after the cessation of rainfall (being fed by groundwater discharge).

Landslide – The downslope movement of a mass of earth caused by gravity. Includes but is not limited to debris slides, torrents, rock falls, debris avalanches, and creep. It does not include dry ravel or surface erosion by running water. It may be caused by natural erosional processes, by natural disturbances (e.g., earthquakes or fire events) or human disturbances (e.g., mining or road construction).

LWD – Large woody debris; portions of downed trees that collect in the stream and provide channel structure and habitat for aquatic animals.

Maintained road – A road which is regularly inspected and whose cutslopes, road surface, drainage structures and fillslopes are maintained to prevent erosion and deterioration.

Maintenance activities – Routine maintenance activities that may require clearing, grading, or excavation to maintain original line and grade, hydraulic capacity, or original purpose of the facility.

Maintenance facilities – Facilities under County ownership or control that contain such areas as fueling areas, waste storage or disposal facilities, wash racks, equipment or vehicle storage, and materials storage areas.

Mass wasting – Downslope movement of soil mass under force of gravity; often used synonymously with “landslide”.

Mature tree - A tree with width greater than a 12-inch (30cm) diameter at breast height (dbh).

Mitigate – To offset or lessen real or potential negative environmental impacts or effects through the application of additional controls or actions.

Mulch – Material placed or spread on the surface of the ground to protect it from raindrop, rill and gully erosion. Mulches include wood chips, rock, straw, wood fiber, and a variety of other natural and synthetic materials.

Nonpoint source discharge – Discharge from a diffuse pollution source, that is one without a single point of origin or not introduced into a receiving stream from a specific outlet like a pipe.

Oil waste – Oil of any kind or in any form, including but not limited to petroleum, fuel oil, sludge, oil refuse, and oil mixed with wastes other than dredged soil.

Ordinary High Water Mark – “That line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of the soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding area.” [33 CFR 328.3(e)]

Organic matter – Material that is derived from living organisms, such as plants.

Outboard fill – The outside road edge fill material, usually generated by side cast road construction. This fill often comprises up to half the running surface width.

Outboard berm – A mounded earthen curb along the outboard edge of the road usually generated by periodic grading of the road. Berms trap water on the road.

Outfall – The discharge from a CMP, quantified by the vertical distance from the CMP outlet to its catchment basin.

Out-migration – The life cycle phase of anadromous salmonid fish, where juveniles move downstream from fresh water to the estuary and then the ocean for their salt water phase.

Outsloped road – Road surface that is sloped out away from the cutbank toward the road’s fillslope. Outsloped roads may or may not have an inboard ditch.

Outsloping – The act of converting an insloped road to an outsloped road. Outsloping can also refer to the act of excavating the fill along the outside of the road and placing and grading it against the cutbank, thereby creating an outsloped surface where the roadbed once existed.

Partial bench – A partial bench road is one in which the road bed is part bench and part fill, somewhere between full bench and a full fill road.

Peak flow (flood flow) – The highest amount of stream or river flow occurring in a year or from a single storm event.

Perched outlet – A condition in which a culvert’s outlet is suspended over the immediate downstream pool, requiring fish to leap into a culvert (DFG).

Perennial stream – A stream that typically has running water on a year-round basis.

Permanent road – A road which is planned and constructed to be part of a permanent all-season transportation system. These roads have a surface which is suitable of use throughout the entire winter period and have drainage structures, if any, at watercourse crossings which will accommodate the 50-year flood flow. Permanent roads receive regular and storm-period inspection and maintenance.

Permeable fill – See *Drainage blanket*.

Photopoint – Established point on the landscape used to conduct photographic monitoring.

Put-to-bed - The process of actively abandoning a road by eliminating all conceivable risks of sediment production until the road is again needed in future years. “Putting-to- bed” or road closure involves completely removing stream crossing fills and associated drainage structures and eliminating the risk of sediment production from roads. (See *Road closure*.)

Range finder – A hand-held field instrument used to measure distances less than about 1000 feet.

Ratio (slope) – A way of expressing slope gradient as a ration of horizontal distance to vertical rise, such as 3:1 (3 feet horizontal for every 1 foot vertical rise of fall).

Ravel (dry ravel) – Soil particles dislodging and rolling down a slope under the influence of gravity. Ravel occurs most rapidly when a cohesionless soil on a steep slope dries out. Ravelling is dramatically increased when frost acts on the exposed soil. Ravel on some steep, bare cutbanks can quickly fill ditches and supply sediment that is then eroded and moved to nearby ditch relief culverts or streams by concentrated ditch flow.

Rearing – The phase of a life cycle for a salmonid fish, where juveniles emerge from eggs and grow to large enough size to become adults or migrate to the ocean (for anadromous forms).

Redd – The nest depression, constructed by spawning salmonid fish in stream gravels, in which the eggs are laid.

Rill – A small erosion channel formed by concentrated surface runoff that is less than one square foot in cross sectional area. It typically forms where rainfall and surface runoff is concentrated on fillslopes, cutbanks, and ditches. Larger channels are called gullies.

Rip-rap – The large rock or other suitable material placed on the ground or along streambanks as an armoring device to prevent or reduce erosion.

Riparian – The banks and other lands adjacent to lakes, watercourse, estuaries, and wet areas. Often refers to water-loving vegetation along the water’s edge.

Riparian zone –Area alongside a stream that provides shade for water temperatures, streambed and flow modification by contributing large woody debris, filtration of organic and inorganic material, upslope stability, bank and channel stabilization and vegetative structure diversity for fish and wildlife habitat. (Source: California Forest Practice Rules, California Department of Forestry and Fire Protection Resource Management-Forest Practice Program, 2003.

River run rock – Aggregate (gravel) that is excavated from a river bed. It is usually well rounded and, unless screened, also contains sand.

Road abandonment – In the past, road abandonment was synonymous with blocking the road and letting it grow over with vegetation. Today, proper road abandonment involves a series of proactive steps and activities that essentially erosion-proof a road so that further maintenance will not be needed and significant erosion will not occur. (See also: *Road closure*)

Road closure – Also called “proactive road abandonment”, it is a method of closing a road so that regular maintenance is no longer needed and future erosion is largely prevented. The goal of road closure is to leave the road so that little or no maintenance is required for stability while the road is unused. Road closure usually involves erosion-proofing techniques including removing stream crossing fills, removing unstable road and landing fills, installing cross road drains for permanent road surface drainage and other erosion prevention and erosion control measures as needed. Proper road closure is not accomplished by blocking a road and walking away from it to let “nature reclaim the road”. (See also: *Road abandonment*)

Road failure – Damage to the roadbed (usually caused by a road bed slump, fill failure, stream crossing washout or major gully) which prevents vehicular passage, but does not usually mean minor cutbank or fill sloughing incidental to road settling.

Road fill excavation – Excavation and removal of unstable or potentially unstable fill and/or sidecast spoil from the outer edge of a road prism. Road fill excavations are performed as a preventive measure to guard against landsliding of unstable material into downslope stream channels.

Road grade – The slope of a road along its alignment.

Road maintenance – The actions taken to prevent erosion and/or the deterioration of a road, including the cutbank, the road surface, the fillslope and all drainage structures. Road maintenance activities include such tasks as grading, ditch cleaning, brushing and culvert cleaning.

Road network – The pattern of all the roads in an ownership, watershed, hillside or other defined area. The road network typically includes main trunk roads, secondary roads, and spur roads (in logging areas).

Road reconstruction – Repair or upgrading of those pre-existing roads that are to be restored or improved to make them useable for traffic. Reconstruction typically refers to road rebuilding when one or more road failures have occurred. (See: *Road failure*)

Road runoff – Surface runoff that collects on and is drained from the road surface, usually as a direct response to rainfall.

Rock armor – Coarse rock that is placed to protect a soil surface, usually from erosion caused by flowing or falling water. Rock armor is one type of material used for energy dissipation at culvert outfalls.

Rock pit – A large outcrop of bedrock that has been developed for aggregate uses, such as road surfacing material and/or larger rock armor. A borrow pit is an excavation from which material is removed for use in another location. (See also: *Borrow site*)

Rolling dip – Shallow, rounded dip in the road where road grade reverses for a short distance and surface runoff is directed in the dip or trough to the outside or inside of the road. Rolling dips are drainage facilities constructed to remain effective while allowing passage of motor vehicles at reduced road speed.

Runoff – Rainfall or snowmelt which flows overland across the surface or hillslopes and along roads and trails.

Rust line – The upper limit of rust inside a CMP which reflects the depth of sustained high water flows through the pipe.

Salmon, Chinook – A salmonid species, also called King Salmon in California.

Salmon, Coho – A salmonid fish species, also called Silver Salmon in California.

Salmonid – A species of fish that is a member of the salmon and trout family.

Sanitary sewer system – Underground pipes that carry off only domestic and industrial waste, not storm water.

Sediment – Organic or inorganic material that is carried or suspended in water and that settles out to form deposits in the storm drain system or receiving waters.

Sediment delivery – Material (usually referring to sediment) which is delivered to a stream channel. Sediment delivery often refers to the percent of material eroded from a site which actually gets delivered to a stream channel (as opposed to that which is stored on the hillslope).

Sheet erosion – The loss of thin layers of soil across a large surface area.

Shotgun culvert – A CMP that protrudes from the road fill with no down spout. The falling water often causes substantial erosion in the catchment area.

Sidecast – The excess earthen material pushed or dumped over the side of roads. Sidecasting usually refers to pushing loose dirt off the road down an embankment (as opposed to leaving loose dirt piled along the shoulder or roadside ditch after activities such as blading. This practice (in this manual) refers to relatively small quantities of soil created through activities such as blading the surface or road shoulders, not large quantities of soil from landslides or other mass wasting events.

Silt fence – A constructed barrier used to contain soil eroded from a construction site. The barrier is made from filter fabric stretched between fence posts placed on contour along a slope.

Slope ratio – See *Ratio*

Slope stability - The resistance of a natural or artificial slope or other inclined surface to failure by landsliding (mass movement).

Slump – An episodic, fast to very slow mass movement process involving the rotation of a block of hillslope or road along a broadly concave slip surface, often referred to as a rotational slide.

Smolt – A juvenile salmonid fish in the later phase of transitioning from fresh water to salt water, before migrating to the ocean.

Spawning – The phase of adult salmonid fish where redds (nests) are made and eggs are laid in gravels of streams.

Species of Special Concern – A designation used by California (CSC) and federal (FSC) agencies to refer to those species of animals (and sometimes plants) that have declining population levels, limited ranges, and/or continuing threats that have made them vulnerable to extinction. They may soon reach the point where they meet criteria for listing as threatened or endangered under the State and/or Federal Endangered Species Acts. No special legal protections are associated with this designation alone.

Spoil disposal site – The location where spoil material (woody debris and excavated soils) can be placed without the threat of accelerated erosion or of initiating slope instability. Stable spoil disposal sites include the cut portion of closed roads, the inside portion of turnouts, and flat or low gradient natural benches.

Spoil (spoil materials) – Material (soil and organic debris) that is not used or needed as a functional part of the road or a landing. Spoil material is generated during road construction, reconstruction, and maintenance activities.

Spur road – A side road off a main trunk road or a secondary road. Most spur roads are dead-end.

Steelhead – The anadromous form of the rainbow trout. Aside from their sea-going habits and large size at spawning, there is little to distinguish them from rainbow trout that are resident in the same streams that steelhead use for spawning.

Storm maintenance (emergency road maintenance) – Road inspection and maintenance that is performed during periods of high rainfall and runoff when drainage structures are most likely to plug, malfunction or fail.

Storm water – Rainfall runoff, snow melt runoff, surface runoff and drainage.

Storm water drainage system – Streets, gutters, conduits, artificial drains, channels and watercourses, or other facilities that are owned, operated, maintained, and used for the purpose of collecting, storing, transporting, or disposing of storm water.

Stream – A natural configuration in the land surface that transports water in a perennial, intermittent, or ephemeral circumstance.

Stream Class – A category of a watercourse based on the its *beneficial* use (based on California Board of Forestry regulations, 2000):

Class I Watercourse: A stream (or lake) that is used for a domestic water supply (including springs) on the site and/or within 100 feet downstream of the operations area; and/or fish always or seasonally present onsite, including habitat to sustain fish migration and spawning. (It typically flows year round, but may flow seasonally.)

Class II Watercourse: A stream (or lake) that has fish always or seasonally present offsite within 1000 feet downstream, and/or aquatic habitat for nonfish aquatic species; excludes Class III waters that are tributary to Class I waters. (These streams may flow year round or seasonally; many springs and wetlands are also included.)

Class III Watercourse: A stream channel (or lake) with no aquatic life present but showing evidence of being capable of sediment transport to Class I or II waters under normal high water flow conditions.

Class IV Watercourse: Man-made watercourses, usually downstream, for established domestic, agricultural, hydroelectric supply or other beneficial use.

Stream crossing – The location where a road crosses a stream channel. Drainage structures used in stream crossings include bridges, fords, culverts and a variety of temporary crossings.

Stream crossing excavation – The excavation of the fill material that was used to build (fill) a stream crossing, specifically a culverted crossing, a log crossing, or a temporary crossing. A stable stream crossing excavation must be dug down to the level of the original stream bed, with side slopes graded (excavated) back to a stable angle (usually 50% or less, depending on soil characteristics).

Subdrainage (subsurface drainage) – The flow of water beneath the surface of the ground. Along roads, specific construction techniques can be used to make sure subsurface drainage is not impeded by the road bed or road fill.

Surface erosion – The detachment and transport of soil particles by wind, water or gravity. Surface erosion can occur as the loss of soil in a uniform layer (sheet erosion), in many rills, gullies, or by dry ravel.

Surface runoff – Precipitation, snow-melt, or irrigation water in excess of what can infiltrate the soil surface and be stored in small surface depressions; a major transporter of non-point source pollutants.

Surfacing (surface course) – The top layer of the road surface, also called the wear course. Rock aggregate and paving are two types of surfacing used to weather-proof the road for winter use.

Swale – A channel-like linear depression or low spot on a hillslope which rarely carries runoff except during extreme rainfall events. Some swales may no longer carry surface runoff under the present climatic conditions.

Take - To harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct (as defined by the federal Endangered Species Act); to hunt, pursue, catch, capture, or kill, or to attempt to do any of these things (as defined by the California Endangered Species Act).

Threatened Species – Any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range; an official designation under the California and/or Federal Endangered Species Acts.

Through-cut (Double cut) – A road section that has a cutbank on each side of the road, both higher than the road elevation. This condition channels water down the road and usually creates an erosion source until a drainage opportunity occurs at a single cutbank section.

Through-fill – A road which is entirely composed of fill material and which has a berm along both sides of the road, thereby intentionally containing road surface runoff on the road and directing it to a single discharge point, usually a fabricated metal berm-drain. Through-fills are typically found at sensitive stream crossings where the fill is bermed on both sides of the road.

Total Maximum Daily Load (TMDL) – A process under the federal Clean Water Act that provides a tool for implementing State water quality standards and is based on the relationship between pollution sources and instream water quality conditions.

Trash rack – A debris grid built just over or upstream from a culvert inlet to trap floating woody debris before it plugs the culvert inlet.

Turbidity – Water that is cloudy or muddy usually due to sediment.

Unstable areas – Areas characterized by mass movement features or unstable soils, or by some or all of the following: hummocky topography consisting of rolling bumpy ground, frequent benches, and depressions; short irregular surface drainages which begin and end on the slope; visible tension cracks and head wall scarps; irregular slopes which may be slightly concave in upper half and convex in lower half as a result of previous slope failure; evidence of impaired ground water movement resulting in local zones of saturation including sag ponds with standing water, springs, or patches of wet ground; hydrophytic (wet site) vegetation; leaning, jackstrawed or split trees; pistol-butted trees with excessive sweep in areas of hummocky topography.

Unstable soils – These soils are indicated by the following characteristics: 1) unconsolidated, non-cohesive soils (coarser textured than loam) and colluvial debris including sands and gravels, rock fragments, or weathered granitics (e.g., decomposed granite or “DG”). Such soils are usually associated with a risk of shallow-seated landslides on slopes of 65% or more, having non-cohesive soils less than 5 feet deep in an area where precipitation exceeds 4 inches in 24 hours in a 5-year recurrence interval; 2) increase and decrease in volume as moisture content changes. During dry weather, these materials become hard and rock-like exhibiting a network of polygonal shrinkage cracks and a blocky structure resulting from dessication. Some cracks may be greater than 5 feet in depth. When wet, these materials are very sticky, dingy, shiny and easily molded.

Washed out stream crossing – A stream crossing fill that has been partially or completely eroded and “washed” downstream. Washouts usually occur when a culvert plugs and streamflow backs up and flows over the roadbed during flood events.

Waters of the U.S. – In nontidal waters, this federal legal jurisdiction extends: a) to the ordinary high water mark in the absence of adjacent wetlands; b) beyond the ordinary high water mark to the limit of the adjacent wetlands when present; c) to the limit of the wetland when only wetlands exist.

Waters of the State – Any surface water or groundwater, including saline waters, within the boundaries of the state (§13050(e) of the Porter-Cologne Water Quality Control Act).

Watercourse – Surface water bodies including streams, lakes, bays, estuaries, lagoons, reservoirs, and ponds. The term includes any well defined channel with distinguishable bed and bank showing evidence of having contained flowing water indicated by deposit of rock, sand or gravel.

Water quality – The chemical and biological characteristics of stream and lake water.

Watershed – The area or drainage basin contributing water, organic matter, dissolved nutrients and sediments to a stream or lake.

Wetlands – Areas that are inundated by surface water or ground water with a frequency sufficient to support, and under normal circumstances do or would support, a prevalence of vegetative or aquatic life that require saturated or seasonally saturated soil conditions for growth and reproduction (Executive Order 11990). Wetlands generally include, but are not limited to, marshes, bogs and similar areas.

Winterize – To perform erosion prevention and erosion control work on a road in preparation for winter rains and flood flows.

Sources: Weaver & Hagans (1994); Caltrans (1998); Downie et al. (1998); Lewis et al. (2000); ODOT (1999); various state and federal statutes and regulations.