

## TRAIL USER WORKING GROUP

# GLOSSARY

(as of January 2021)

**Abutment:** A structure at either extreme end of a bridge that supports the superstructure (sill, stringers, trusses, or decks), composed of stone, concrete, brick, or timber.

**Accessible:** A term used to describe a site, building, facility, or trail that complies with the Americans with Disabilities Act (ADA) Accessibility Guidelines and can be approached, entered, and used by people with disabilities.

**Adopt-A-Trail:** A program in which groups or businesses "adopt" trails, providing volunteer work parties at periodic intervals to help maintain those trails. Though no special trail privileges are granted, the trail manager generally acknowledges that a trail has been "adopted" by erecting signs indicating the trail is part of an Adopt-A-Trail program and including the name of the adopter.

**Aggregate:** Crushed stone or gravel used for construction.

**Alignment:** The route proposed for or taken by a trail.

**All-Terrain Vehicle (ATV):** A wheeled or tracked motorized vehicle designed primarily for recreational use or for the transportation of property or equipment exclusively on trails, undeveloped roads, marshland, open country, or other unprepared surfaces.

**Amenities:** Any structure used to enhance the user's experience and comfort along a trail or at a trailhead, such as a restroom, picnic table, or drinking fountain.

**Americans with Disabilities Act Accessibility Guidelines (ADAAG):** Design guidelines for making to a range of indoor and outdoor settings accessible to people with disabilities.

**Americans with Disabilities Act of 1990 (ADA):** A U.S. federal law prohibiting discrimination against people with disabilities. Requires public entities to provide accessible accommodations for people with disabilities.

**Anchor:** An object, such as a stone or tree, that defines the sides of the trail, helping to keep users in the center of the tread; also a large stone that holds other stones in place.

**Angle of Repose:** The maximum angle measured from the horizontal at which rocks, sand, soil, etc. will stay at rest without moving down the slope.

**Archaeological Resources (Cultural, Heritage):** Any material of past human life, activities, or habitation that are of historic or prehistoric significance. Such materials include, but are not limited to, pottery, basketry,

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bottles, weapon projectiles, tools, structures, pit houses, rock paintings, rock carvings, graves, skeletal remains, personal items and clothing, household or business refuse, or any piece of the foregoing.

**Arid:** A climate or region in which precipitation is deficient in quantity or occurs infrequently.

**Armoring:** Reinforcement of a surface, whether trail or creek bed, with a protective layer of rock, brick, stone, aggregate, concrete, or similar material to carry traffic or prevent erosion.

**Aspect:** The compass direction a topographical slope face. Aspect affects the amount of solar radiation and year-round moisture to which a site is subjected.

**Assessment, Trail:** Physical assessments undertaken to better understand a trail or corridor. Assessments include an accurate description and documentation of native elements and an inventory of built structures and conditions along the trail or corridor.

**Average Trail Grade (Overall Trail Grade):** The average steepness of a trail over its entire length.

**Average Trail Segment Grade:** The average slope of a certain trail segment.

**Backcountry:** Remote areas where trails and trail facilities have lower levels of use, lower user expectations, and lower design and construction standards.

**Backcut:** The vertical part of a bench cut that is blended into the backslope.

**Backslope:** The cut bank along the uphill side of the trail extending upward from the tread, sloped back to an angle to where it is stable and will not unravel or slide onto the trail.

**Batter:** The angle of a retaining wall's tilt into the slope of the hillside.

**Bedrock:** Solid rock material underlying soils and other earthy surface formations.

**Bench Cut, Full:** The total width of the trail tread is excavated out of the slope, and the trail tread contains no compacted fill material. The most durable and recommended style of bench cut trail.

**Bench Cut, Half:** Half the width of the trail tread is excavated out of the slope, and the outside of the trail tread contains the excavated and compacted material.

**Bench Cut, Partial:** Part of the width of the trail tread is excavated out of the slope, and the rest of the trail tread is made up of fill material.

**Bench Cut:** A relatively flat, stable surface (tread) on a hillside made by excavation. When excavated often referred to as full, half or partial bench.

**Berm:** The ridge of material formed on the outer edge of the trail, that is higher than the center of the trail tread. When improperly designed or unintentionally caused by tread compaction and soil displacement during trail use, a berm can trap water on the trail and lead to erosion.

**Blowdown (Windfall):** Anything (trees, limbs, brush, etc.) blown down on the trail by the wind.

**Boardwalk:** A trail structure used to span wet, boggy areas; areas with chronically standing water; or areas with poor soil capability such as sand. They usually consist of sills, piers, joists, soil dams, and decking. Boardwalks

have varying designs that are usually built close to the ground but may exceed 48 inches from the top of the decking to the ground.

**Bridge:** Structure (including supports) that is erected over a depression or watercourse, with a deck to carry traffic. A bridge is usually more than four feet above the ground, longer than twelve feet in length, and has railings.

**Broadcasting:** The process of distributing excavated soil as far downhill and away from the new tread as possible.

**Brush:** Small vegetation less than 20 feet in height such as herbaceous plants and low-growing woody shrubs.

**Brushing:** The process of clearing the trail corridor of plants, trees, and branches that could impede the progress of trail users on the travelway, completed on a cyclical basis.

**Buffer (Buffer Zone):** Any type of natural or constructed barrier (trees, shrubs, or wooden fences) used between the trail and adjacent lands to minimize impacts (physical or visual). Buffers also provide a transition between adjacent land uses.

**Canopy:** The more or less continuous cover of branches and foliage formed collectively by the crowns of adjacent trees and other woody growth in a forest.

**Capacity (Carrying Capacity):** The maximum number of trail users that can pass through a section of trail during a given time period under existing trail conditions. Also refers to the amount of use a given resource can sustain before an irreversible deterioration in the quality of the resource begins to occur.

**Capstone:** A stone placed in the top or uppermost layer of a structure such as a rock retaining wall.

**Causeway:** An elevated section of trail tread that is raised above the ground by the placement and compaction of permeable backfill material contained by rock. Usually constructed through permanently or seasonally wet areas.

**Center Line:** An imaginary line marking the center of the trail. During trail layout, the center line is usually marked by placing a row of flags or stakes. During construction, the outboard hinge is flagged.

**CEQA:** California Environmental Quality Act

**Challenge Park (Terrain Park, Skills Area):** A special-use area that features a variety of technical trail features.

**Check Dam:** A log, rock, or wood barrier set perpendicular to a rill or gully on eroding trails to slow the flow of water and to allow fine particulate material to accumulate behind the structure.

**Choke (Gateway):** A slight narrowing in the trail used to control user speed.

**Circle of Danger:** The area surrounding a trail worker that is unsafe due to tool use.

**Classification:** A designation of the intended use, design, construction, and maintenance specifications for a trail.

**Clearing Limits:** The outer edge of the travelway to be cleared, usually specified by trail classification.

**Clearing:** The removal of windfall trees, uproots, leaning trees, loose limbs, wood chunks, etc. from both the vertical and horizontal trail corridor.

**Climbing Turn:** A turn to reverse direction on a trail constructed on a less than 30% slope that doesn't have a constructed turning platform or landing. The upper and lower legs of a climbing turn are generally joined by a short section of trail (the apex of the turn) that lies directly in the fall line. Climbing turns located on hillsides with too steep of a grade are erosion prone and should be replaced with well-built switchbacks.

**Clinometer:** A hand-held instrument used for measuring trail grade. The user sights through the Clinometer to a reference (usually a second person) and reads the measurement directly from the internal scale in degrees or percent.

**Compaction:** Consolidation obtained through the removal of voids in soil or earthen materials by tamping the materials with hand tools or machinery, accomplished in lifts no greater than three inches.

**Contour Line(s):** A line on a topographic map connecting points of the land surface that have the same elevation.

**Contour Trail:** A trail constructed such that it follows a contour, with its elevation remaining constant.

**Control Points:** Existing natural or man-made features that the trail alignment must go to or avoid. The beginning and end of a trail are basic control points. Positive control points are places you want trail users to visit including parking areas, trailheads, structures, slopes for turns or switchbacks, road or water crossings, and other trails. Negative control points are places you want users to avoid including sensitive habitat, culturally sensitive areas, or sensitive vegetation.

**Corralling:** The act of placing anchors on the trail to define the sides and emphasize the turns, keeping users on the tread.

**Corridor, Trail:** The full dimensions of the trail, including the area on either side of the tread and the space overhead, that need to be cleared of brush and obstacles.

**Creep:** The slow movement of soil down relatively steep slopes, primarily caused by gravity and water. (Also see Tread Creep.)

**Crib Wall:** A retaining wall used to stabilize the trail tread and prevent it from collapsing down the fall line. Can be built with rock or rot-resistant wood.

**Critical Point:** The outside edge of the trail. It's called the critical point because this is where trail maintenance problems (usually related to drainage) begin. Rounding the outside edge helps water drain from the trail.

**Crown Tread (Crowning):** A method of trail construction where the center portion of the tread is raised to allow water to disperse to either side of the trail.

**Crusher Fines:** Limestone, granite, or gravel that has been run through a crusher, which, once wetted and compacted, creates a smooth, hard trail surface for high-use areas.

**Culvert:** A pipe or box-like construction of wood, metal, plastic, or concrete that conveys a stream under a trail without constricting water flow.

**Curvilinear:** A trail alignment that follows the contour of the landform, tucking in and out of features such as drainages, crenulations, and ridges, and crossing contours at oblique angles.

**Cut and Fill:** The process of removing soil from one area (cut) and placing it elsewhere (fill) to form a base for any given activity.

**Deadfall:** A tangled mass of fallen trees or branches.

**Deadman/Deadmen:** A log or logs, heavy timber or timbers, a large block of concrete, a large boulder, or a combination of these materials that is partially or completely buried. Deadmen are used to anchor sections of armored trail or wood retaining walls.

**Deberming:** Removing the high ridge of material that has formed along the outer edge of a trail, allowing water to once again flow off-and not down-the trail.

**Degrade:** The erosion or lowering of a stream bed that occurs when the sediment carrying capacity of the stream increases, usually from increased water volume or flow rate.

**Dog Walkers:** People visiting the parks with companion dogs. (Either private/recreational dog walkers or commercial/professional dog walkers.)

**Doubletrack Trail:** A trail that allows for two users to travel side by side, or to pass without one user having to yield the trail. Doubletrack trails are often old forest roads.

**Downslope:** The downhill side of a trail.

**Drain Dip:** A gradual dip in the trail bed between natural topographic watercourse features that diverts water off the trail bed. A good drain dip is one that is hardly noticeable.

**Drain Lens:** Drainage structure placed under the trail consisting of either porous rock wrapped with geotextile fabric or a graded aggregate that is intended to allow water to seep under the trail while keeping the trail's surface dry.

**Drain Swale:** A small topographic feature naturally formed by an ephemeral drainage that does not have a visible stream channel or bed. The trail should gradually dip in and climb out of the swale.

**Drain, French:** A stone-filled ditch that can have porous pipe along the base to collect and disperse water. The top must be kept clear of the surfacing material, allowing water to run freely into the drain.

**Drainage:** The way in which water flows downhill and/or off the trail.

**Dual Use Trail:** A trail that allows two uses such as horses and hikers only or hikers and bicycles only.

**Duff:** Layer of decaying organic material deposited on the ground and comprised of leaves, needles, woody debris, and humus.

**Duty of Care:** The legal "duty of care" that a landowner owes a member of the general public varies from state to state. Generally, liability depends on the status of the injured person. Liability increases from the lowest risk to the highest-from trespasser, licensee, and invitee, to child.

**Easement:** Grants the right to use a specific portion of land for a specific purpose or purposes. Easements may be limited to a specific period of time or may be granted in perpetuity; or the termination of the easement may be predicated upon the occurrence of a specific event. An easement agreement survives transfer of landownership and is generally binding upon future owners until it expires on its own terms.

**E-Bikes:** As defined by the California Vehicle Code 312.5, an electric bike, or e-bike, is a bicycle equipped with fully operable pedals and an electric motor of less than 750 watts, separated into three classes:

- “Class 1 electric bicycle,” or “low-speed pedal-assisted electric bicycle,” is a bicycle equipped with a motor that provides assistance only when the rider is pedaling, and that ceases to provide assistance when the bicycle reaches the speed of 20 miles per hour.
- “Class 2 electric bicycle,” or “low-speed throttle-assisted electric bicycle,” is a bicycle equipped with a motor that may be used exclusively to propel the bicycle, and that is not capable of providing assistance when the bicycle reaches the speed of 20 miles per hour.
- “Class 3 electric bicycle,” or “speed pedal-assisted electric bicycle,” is a bicycle equipped with a motor that provides assistance only when the rider is pedaling, (no throttle) and that ceases to provide assistance when the bicycle reaches the speed of 28 miles per hour, and equipped with a speedometer.

**Embankment:** The outboard portion of the trail bench that is comprised of compacted fill material; often referred to as the “fill slope” or “outboard fill material.”

**Endangered Species:** Any species that is in danger of extinction throughout all or a significant portion of its range.

**Energy Dissipater:** A rock tray constructed below the outflow of a drainage feature, such as a culvert or drain dip, that is used to reduce the energy of flowing water onto the slope below.

**Entrenched Trail:** A trail with cupping, rutting, or trenching on the trail tread from trampling, standing water, uncontrolled surface run off, and/or accumulation of slough and berm. The resulting tread surface is lower than the inboard and outboard hinges.

**Equestrian:** Of horses, horseback riding, riders, and horsemanship.

**Erosion Control:** Techniques used to minimize soil movement caused by water runoff, wind, or user traffic.

**Erosion Prevention:** Techniques used to prevent soil movement caused by erosion.

**Erosion, Gully (Gullying):** Concentrations of runoff water cut into the soil forming single or numerous channels, usually on steep terrain.

**Erosion:** The natural process of wearing down and removing rock and soil by wind and water. Trail erosion can be accelerated by a combination of users, water, and gravity.

**Exotic Species:** Plants introduced from another country or geographic region outside their natural range.

**Exposure:** The relative hazards encountered when one takes into consideration obstacles, alignment, grade, clearing, tread width, tread surface, sideslope, isolation, and proximity to steep slopes or cliffs.

**Face:** The steep, exposed side of a rock or slope.

**Fall Line:** A trail aligned with the natural direction of water flowing down a slope. The direction water flows down a slope is the path of least resistance under most circumstances. Constructing a trail on the fall line creates this path of least resistance and encourages water to run down the trail and leads to erosion.

**Fall Zone:** The area on either side of or below a technical trail feature that provides a clear landing for a rider who has failed to negotiate the obstacle.

**Fill (Material):** Native or imported material used to fill voids in trail tread and to pack behind retaining walls and other structures or to construct trail structures. Fill can include soil, aggregate, gravel, crushed rock, or rock cobble.

**Fill Slope:** The portion of a trail that is constructed from excavated material. In trail construction a fill slope can be constructed on the outboard portion of a trail bench with compacted fill material. Fill slope can be unstable and thus should not be used to build trail tread. Full bench construction is preferred.

**Fines:** Aggregates generally consisting of natural sand or crushed stone with most particles passing through a 9.5 mm (3/8 inch) sieve.

**Fire Road (Ranch Road, Unpaved Road):** Dirt or gravel road accessible by vehicle that allows firefighting and emergency vehicle or maintenance access by agency staff.

**Flag Line:** A proposed trail alignment delineated with flagging prior to construction that has been attached to branches, trees, stakes, or wires.

**Flagging:** A roll of thin, colored ribbon or squares of colored plastic fabric attached to wires ("pin flags") used for marking trail alignments, trail structure locations, or control points.

**Flags, Pin:** Wire wands with square plastic flags at one end for field layout and marking of new trail or relocations of trail sections.

**Flow:** The rhythm or "feel" of a trail. Two basic types include "open and flowing" and "tight and technical."

**Footing:** The part of a structural foundation that rests on the ground, supporting and spreading the weight of the structure above.

**Ford:** A water-level-stream crossing that can be improved or armored to provide a level, low-velocity surface for trail traffic that is comprised of smaller rocks and aggregate or articulated cinder blocks. Sometimes associated with a bridge; fords are intended to accommodate stock.

**Frontcountry:** The area near developed facilities such as campgrounds, visitor centers, or day use areas that have high levels of use, user expectations, and design and construction standards.

**Full Bench:** When the total width of the trail bed is excavated into the native slope or hillside.

**Full Recontouring:** Complete removal of a trail by recovering all available fill and burying and shaping the trail prism until the surrounding terrain is fully matched.

**Geographic Information System (GIS):** A spatial database mapping system (computer and software) that contains location data for trails and other important features.

**Geomorphology:** The study of the earth's surface and the processes that shape it. Geomorphology is closely related to geology.

**Geotextile (Geosynthetic, Geofabric, Filter Fabric):** A semi-impervious, non-woven, petrochemical fabric that provides a stable base for the application of soil or gravel. Most common use is in the construction of turnpikes.

**Global Positioning System (GPS):** A system used to map trail locations using satellites and portable receivers. Data gathered can be downloaded directly into GIS database systems.

**Grade Reversal** A reverse in the trail grade-usually a short dip followed by a rise-that forces water off the trail. Grade reversals are known by several different terms, including grade dip, grade brake, drainage dip, and rolling dip. Frequent grade reversals are a critical element of sustainable trail design. Most trails will benefit from grade reversals every 20 to 50 feet, depending on soil type and rainfall.

**Grade:** The amount of elevation change between two points over a given distance expressed as a percentage (feet change in elevation for every 100 horizontal feet, commonly known as "rise over run"). A trail that uses 8 vertical feet in 100 horizontal feet has an 8-percent grade.

**Groundwater Table (Water Table):** The upper limit of the part of the soil or underlying rock material that is wholly saturated with water. In some places an upper, or perched, water table may be separated from a lower one by a dry zone.

**Grub (Grubbing):** To dig or clear roots and tree stumps near or on the ground surface of the trail tread.

**Gully:** When concentrated runoff cuts into soil forming a channel greater than one square foot in cross section area.

**Half Rule:** A trail's grade shouldn't exceed half the grade of the sideslope. If the trail grade is steeper than half the grade of the sideslope, it is considered a fall-line trail and gravity will pull water down the trail instead of across it. This leads to erosion of the trail tread.

**Hardening:** The manual, mechanical, or chemical compaction of the trail tread resulting in a hard and flat surface that sheets water effectively and resists the indentations that are created by use.

**Hazard Tree:** An unstable tree, usually greater than five inches in diameter at breast height (dbh), in danger of falling where people congregate, such as a trailside shelter bridge, campsite, or overlook.

**Header, Stone or Rock:** A long, uniform stone laid with its narrow end toward the face of a retaining wall or crib used intermittently to structurally tie in the other rocks laid in the wall.

**Headwall:** A retaining or support structure at the entrance to a culvert or drainage structure.

**Hikers / Joggers / Walkers:** People using the parks, generally on the trails, under their own locomotion (that is, without wheeled equipment such as wheelchairs, bikes, or skates).

**Hybrid:** A trail design that blends "open and flowing" and "tight and technical" features.

**Hydrology:** The scientific study of the properties, distribution, and circulation of water on land's surface and subsurface, and in the atmosphere.



**Impermeable Material:** A soil or material whose properties prevent the movement of water.

**Inboard Ditch:** A drainage ditch cut along the inboard side of the trail to intercept drainage from the slope above or from small springs emanating from the hillslope.

**Inboard Hinge:** Slope transition on the inside, or uphill side, of trail tread where the trail tread and backslope converge.

**Infrastructure:** The facilities, utilities, and transportation systems (road or trail) needed to meet public and administrative needs.

**Inside Turns:** On a trail traversing a hillside, concave, or naturally banked turns in which the sideslope helps direct trail users around the turn.

**Interfluvial:** The land between watercourses.

**Keystone:** A large stone that holds others in place. Also called an anchor.

**Kiosk (Sign):** A freestanding bulletin board that houses informational or interpretive displays.

**Knick:** Shaved-down section of trail, about 10 feet in diameter, with an exaggerated outslope. Like a drain dip, a knick is used to shed water off a trail and is a useful remedy for wet spots on relatively flat trails.

**Large Woody Debris:** Logs and tree stumps with a diameter greater than 12 inches and a length greater than 6 feet. Also known as large organic debris.

**Legal Public Access:** The right of passage, established by law, over another's property. Can be created by an easement dedicated or reserved for public access. Legal public access exists on public land, public waters, public rights-of-way, and public easements.

**Inslope (Insloping):** When the trail bed slopes down toward the inboard hinge or backslope causing water to run along the inside of the trail.

**Load (Dead):** Total physical weight of a bridge or structure including all of the structural components.

**Load (Live):** Temporary bridge loads associated with user traffic. These dynamic loads may involve considerations such as impact, momentum, vibration, slosh dynamics of fluids and material fatigue.

**Loam:** An easily crumbled soil consisting of a mixture of clay, silt, and sand.

**Machine Built:** A trail or feature constructed with the use of an excavator, trail dozer, or other piece of equipment.

**Management:** Includes the overall policy, planning, design, inventory, mapping, construction, and maintenance of a trail or greenway segment or site, as well as the operational aspects of administration.

**Master Plan:** A comprehensive, long-range plan intended to guide the greenway and trail development of a community or region. Includes analysis, recommendation, and proposals of action.

**Maximum Sustainable Grade:** The steepest section of a trail that is still sustainable. Although maximum sustainable trail grade is typically about 15 to 20 percent, it is site-specific and fluctuates based on several factors.

**Maximum Trail Grade:** The steepest section of a trail. (The section must be more than 10 feet in length.)

**Meander:** A series of gentle curves in a stream, road, or trail.

**Measuring Wheel (Cyclometer):** A device that records the revolutions of a wheel and hence the distance traveled by the wheel on a trail or land surface.

**Memorandum of Understanding/Agreement (MOU/MOA):** A signed, written agreement entered into by various governmental agencies and nonprofit groups to facilitate the planning, coordination, development, and maintenance of a trail or trails system.

**Microtopography:** Small bumps and rises in the landscape.

**Mineral Soil:** Soil or aggregate that is free of or below the top layer of leaves, roots or other organic substances and contains no particles greater than two inches in diameter. When making a bench cut, always dig down to mineral soil if possible.

**Mitigate (Mitigation):** Action taken to avoid, minimize, reduce, eliminate, or rectify adverse impacts related to trail construction, maintenance, or use.

**Mud Sill:** The horizontal framing member in the foundation of a bridge, boardwalk, or puncheon used to support and elevate the stringers or joists above the ground.

**Multi-Use Trail:** A trail that permits more than one user group-equestrians and hikers and mountain bikers, for example-at a time.

**Natural Surface (Trail):** A tread made from clearing and grading the native soil and with no added surfacing materials that is not accessible by vehicle.

**Obstacle(s):** Physical objects large enough to significantly impede or slow travel on a trail. Logs, large rocks, and rock ledges are common obstacles.

**Off-leash Dogs:** Companion dogs, not on leashes, in the company/under the supervision of owners or handlers. (Note: Off-leash dogs are not free-roaming or feral dogs.)

**One-Way Trail (Directional-Use Trail):** A trail managed in such a way as to encourage users to travel in one direction. May be reversed periodically.

**Open and Flowing:** A type of trail design that allows for sweeping turns, higher speeds, and longer sight lines.

**Organic Soil:** Soil that is made up of leaves, needles, plants, roots, bark, and other organic material in various stages of decay, and that has a large water/mass absorption ratio. Generally the first (or outermost) layer of soil.

**Outboard Hinge or Critical Edge:** Slope transition on the outside, or downhill side, of trail tread where trail tread and hillslope converge.

**Outcrop:** A rock formation that protrudes through the level of the surrounding soil.

**Outside Turns:** Convex or off-camber turns (usually on trails that traverse hillsides) that are more difficult to navigate, as centrifugal force pulls trail users to the outside of the turn.

**Outslope:** Where trail tread is sloped downward toward the outboard hinge of the trail that leaves the outside edge of a trail lower than the inside to shed water. The outslope should be barely noticeable-usually no more than about 1 inch of outslope for every 18 inches of tread width (or about 5 percent).

**Parallel Ditch:** A drainage ditch, adjacent and parallel to the trail tread, intended to catch water sheeting off the hillslope or surrounding ground, typically used in flat areas with poor drainage or where springs are emitting water out of the hillside above the trail.

**Partial Bench Trail:** (see Bench Cut, Partial)

**Percent of grade:** Preferred method of measuring slope, or a hill's steepness. For example, a grade of 10 percent means there is a rise or fall of 10 vertical feet per 100 linear feet.

**Permeability:** The property of a material that permits the passage of water.

**Pinch Points:** Locations on a trail where features, such as downed and standing trees, rock outcrops, logs, or large rocks, are used in conjunction with curves in the trail to create the appearance that trail has substantially narrowed. Pinch points are used to slow user traffic, thereby reducing user conflicts and improving safety.

**Ponding:** Water accumulation in a low area.

**Primary Trails:** Through-routes that originate at trailheads. Primarily used for directing visitors through an area while promoting a certain type of experience.

**Pruning:** The removal of normal vegetative growth that intrudes beyond the defined trail-clearing limits.

**Puncheon (Bog Bridge):** A type of rustic log or timber boardwalk that is used as a watercourse crossing structure and is built close to the ground (< 24 inches above ground) with an individual span that is usually less than 12 feet. It may be used to cross a small ephemeral drainage or wet, boggy area. It usually consists of muddills, joists, soil dams, and wood decking, but does not include a railing.

**Radius:** An arc or curve that connects two straight trail segments.

**Railing:** A horizontal or diagonal structural member that is attached to vertical posts for the purpose of delineating trails, protecting vegetation, providing safety barriers for trail users at overlooks, and assisting users when crossing bridges or using steps.

**Rail-Trail (Rail-to-Trail):** A multi-purpose, public path (paved or natural) created along an inactive rail corridor.

**Ranch Road:** See Fire Road.

**Raveling:** Rocks or soil separating from the hillslope and depositing on the trail bed, usually associated with an overly-steep or unstable cutbank.

**Rebar:** Steel reinforcing rod that comes in a variety of diameters, useful for strengthening concrete, pin material together, or anchor structures.

**Reconnaissance:** Thorough investigation and evaluation of alternative trail locations prior to selecting the final trail route location.

**Reconstruction:** The work necessary to repair or replace trail structures and features when routine and cyclic maintenance is insufficient to keep the trail safe for users and from impacting resources.

**Recreational Trails Program (RTP):** Federal program providing funds to the States for motorized and nonmotorized trails and trail related projects, based on nonhighway recreational fuel use. ([www.fhwa.dot.gov/environment/rectrails](http://www.fhwa.dot.gov/environment/rectrails))

**Recreational Use Statute (RUS):** State law (in all 50 U.S. states) designed to limit the liability of public organizations, easement donors, landowners, and others who open their lands for public recreation use without charge.

**Regional Parks:** Per the Park District's Master Plan 2013, a regional park is a spacious land area with outstanding natural features and sufficient size to support many outdoor recreational opportunities.

**Regional Preserves:** Per the Park District's Master Plan 2013, a regional preserve is an area with outstanding natural or cultural features that are protected for their intrinsic value as well as for the enjoyment and education of the public.

**Regional Trails:** Network of paved and unpaved trails, managed by EBRPD and other organizations and agencies (i.e. Iron Horse Trail, Bay Area Ridge Trail, and San Francisco Bay Trail).

**Rehabilitation:** The work necessary to bring a trail or trail system up to the design standards and construction specifications appropriate for the trail classification and user type.

**Reroute:** A new section of trail that replaces an existing section. Rerouting is often the best remedy for a poorly designed trail that requires frequent maintenance.

**Restoration:** The work necessary to return a disturbed landscape to its natural or original condition.

**Retaining Wall (Revetment, Crib Wall, Cribbing):** A structure used to prevent soil from slumping, sliding, or falling, usually made of log or stone. Often used to provide stability and strength to the edge of a trail.

**Retaining Wall:** A wooden, rock, log, or concrete wall used to support trail tread or retain slope cuts.

**Rip Rap:** A structure used to armor trail tread and support traffic on trails with high mechanical wear where stones are laid on end in "courses" that are perpendicular to the direction of the trail. Each course progressively rises above the previous course to match the trail grade.

**Rippers:** Curved metal shanks with replaceable hardened steel teeth attached to the end of the shanks. Multiple shanks are part of a hydraulically controlled assembly attached to the back of a dozer.

**Ripping:** The action of decompacting soil by means of rippers mounted on the rear of a dozer.

**Rise and Run:** The angle of inclination of a slope or structure expressed as a ratio of the horizontal length (run) to the vertical ascent (rise).

**Risk Management:** An element of safety management that evaluates the effects of potential hazards on safety by considering acceptance, control, or elimination of such hazards with respect to expenditure of resources.

**Rolling Contour Trail:** A trail characterized by gentle grade, grade reversals, and outsloped tread.

**Rolling Crown Switchback:** A sustainable turn on a hillside engineered for drainage. The trail is routed onto a crowned deck where it makes a transition to the opposite direction. The upper approach is insloped to drain water out the back of the landing. The lower approach is outsloped.

**Rolling Dip:** A trail structure similar to a drain dip or grade reversal but the trail coming into and out of the dip are steeper in grade and shorter in length.

**Rolling Grade Dip (RGD):** An undulation in the tread that traps water and diverts it off the trail. Makes trails more interesting and fun to use. Can be added after initial trail construction.

**Runoff:** Water (not absorbed by the soil) that flows over the land surface usually generated by rain falling on saturated ground or from heavy rain that cannot soak into the ground fast enough.

**Runout:** A section of a trail, usually at or near the base of a descent, that provides adequate length and grade reduction in order for the user to safely stop or negotiate turns, intersections, or structures.

**Scarify:** To break-up and decompact trail bed material so it can be reshaped or bond to new tread material being applied to the trail bed.

**Sediment Control:** Structures, including silt fences and sediment retention basins, that filter, trap, or contain water-carried sediments and prevent them from being further mobilized.

**Sediment:** Soil particles that have been transported away from their natural location by wind or water action.

**Sedimentation:** Deposition of material carried in water, usually the result of a reduction in water velocity below the point at which it can transport the material.

**Shared Use (multi use) Trail:** A trail that accommodates more than one user group-equestrians and hikers and mountain bikers, for example-at a time.

**Sheet flow:** A dispersed flow of water. It minimizes erosion by preventing water from achieving high velocity and carrying away topsoil.

**Shim(s):** A short, thin wedge of rock used to fill the spaces between larger stones.

**Shuttle:** Leaving a vehicle at both ends of a point-to-point trip or pre-arranging a shuttle for pickup and drop off at the beginning and end of a trip.

**Side Slope:** The angle of a hill slope measured in degrees or percentage along the fall line.

**Sight Distance:** Visible, unobstructed, forward and rear view seen by a user from any point on a trail.

**Sight Line:** The visible and unobstructed forward and rear view seen by a trail user from a given point along the trail.

**Sign:** A board, post, or placard that displays written, symbolic, tactile, or pictorial information about the trail or surrounding area. Signage increases safety and comfort on trails. There are five basic types of signs: Cautionary, Directional, Interpretive, Objective, and Regulatory.

**Sill:** Stone or timber supports that keep bridge stringers from contacting the ground.

**Silt:** Non-cohesive soil whose individual mineral particles are not visible to the unaided human eye (0.002 to 0.05 mm). Silt will crumble when rolled into a ball.

**Single Use Trail:** One that is open to only one type of trail user group (i.e. hiking only).

**Singletrack Trail:** A trail so narrow that users must generally travel in single file.

**Sinuosity:** The relative amount of curves along a trail alignment.

**Skills Area:** (see Challenge Park)

**Slide:** Section of soil or rock, located above, below, or within the trail, that gives way and moves down a slope.

**Slope Board:** An attachment to a trail dozer blade used to remove the berm on the outside edge of a trail and lay back and shape the cutbank on the uphill side of the trail.

**Slope:** The natural (or man-made) pitch of the land, as shown on contour maps. Generally refers to the hill, not the trail, as trail "slope" is called "grade."

**Slough (pronounced "Sluff"):** Material from the backslope (or area of the backslope) deposited on the inboard hinge of the trail bed.

**Slump:** Earth movement on a slope that can leave a trail intact but move it downslope, causing a dip in the trail surface.

**Social Trail:** Unplanned/unauthorized trails that develop informally from use and are not designated or maintained by an agency. Often found cutting switchbacks or between adjacent trails.

**Soil Compaction:** A decrease in the volume of soil as a result of compression stress.

**Soil Dam:** A wooden, rock, or concrete structure placed at the ends of the stringers or joists of a bridge or puncheon to separate the stringers and joists from the adjacent ground and provide a smooth transition from the trail surface to the deck of the bridge or puncheon.

**Soil Stabilizer:** Material, either natural or manufactured (such as vegetation, mulch, cement, or synthetic soil stabilizers) used to hold soil in place and prevent erosion due to water, gravity, or trail users.

**Soil Texture:** Relative proportions of the various size groups of individual soil grains in a mass of soil. Specifically, it refers to the proportions of clay, silt, and sand in soil.

**Soil:** Material of clay, silt, sand, organic material, air, water, and weathered rock mixed in various proportions. Soil consists of horizons or layers that have different amounts of weathering and fertility.

**Special Status Species:** Species that are listed, or proposed for listing, as threatened or endangered by the U.S. Fish and Wildlife Service (USFWS) or National Marine Fisheries Service (NMFS), under the provisions of the Endangered Species Act; any species that are covered by the Migratory Bird Treaty; any species designated by the USFWS as a "candidate" or "listing" species or "sensitive" species; any species that are listed and protected by California Department of Fish & Wildlife (CDFW) as rare, threatened, or endangered; and any species that are considered sensitive or of special concern due to limited distribution or lack of adequate information to permit listing or rejection for state or federal status, such as those included on list 3 in the California Native Plant Society (CNPS) Inventory of Rare and Endangered Plants.

**Species of Concern:** Any species, subspecies, or distinct population of animal that is either listed Federally as threatened or endangered, meets the California State definition of threatened or endangered but has not formally been listed; is experiencing or formerly experienced serious population declines or range retractions; or has naturally small populations exhibiting high susceptibility to risk from any factors that could lead to declines that would qualify it for State threatened or endangered status.

**Specifications:** Standards to which trails and structures are built and maintained according to classification and user type.

**Steps:** A structure that provides a safe, stable, uniform vertical rise in steep or unstable terrain, usually made of wood or rock.

**Stream Crossing:** A trail section constructed across a natural stream, such as rock armored, step stone, open culvert, closed culvert, or bridge.

**Stream Gradient:** The slope of a stream channel as measured in percent or degrees, usually identified when constructing a wet stream crossing or removing a road crossing from a drainage.

**Stringer:** The primary member of a bridge superstructure that rests on sills and supports the bridge's decking, posts, and rails. Also known as a girder or beam.

**Summit:** The highest point (top) of a mountain.

**Surface (Surfaced, Surfacing):** Material on top of the trailbed that provides the desired tread. It can lessen compaction of soil, provide a dry surface for users, and prevent potential erosion and abrasion. In addition to concrete and asphalt, trails can be surfaced with dirt, rock, gravel, sand, mud, snow, grass, and other substances.

**Survey, Trail:** A physical field assessment of the trail or proposed trail to determine alignment, maintenance tasks, hazards, impact, etc., prior to work or as part of ongoing trail maintenance.

**Sustainability:** Community use of natural resources in a way that does not jeopardize the ability of future generations to enjoy those natural resources.

**Sustainable Trail:** What every designer and construction crew should strive for: low-maintenance trails that have minimal impact on natural systems.

**Switchback:** A sustainable turn in a trail constructed on a slope greater than 30%. The trail is routed onto a level deck where it makes a transition to the opposite direction.

**Tamping:** Using a machine compactor, a tamping bar, or another tool to compact earth.

**Technical Trail Feature (TTF):** An obstacle on the trail requiring negotiation; the feature can be either built or natural, such as an elevated bridge or a rock face.

**Technical:** A section along a trail that is difficult to navigate; used by mountain bikers to describe challenging sections of trail.

**Ten Percent Average Guideline:** Generally, an average trail grade of 10 percent or less is most sustainable. This does not mean that all trail grades must be kept under 10 percent. Many trails will have short sections steeper than 10 percent, and some unique situations will allow average trail grades of more than 10 percent.

**Terrain Park:** (see Challenge Park)

**Threatened Species:** Any species that is in danger of extinction throughout all or a significant portion of its range.

**Through-Cut:** The portion of a trail that has cutbanks on both sides with drainage flowing down the trail or in a ditch at the base of one of the cutbanks.

**Tie stone:** A header or keystone that spans the breadth of the trail tread.

**Tight and Technical:** A type of trail design that allows for tight turns and slow speeds while using natural features as technical obstacles.

**Topographic (Topo, USGS Topographic, Contour) Map:** Maps that indicate built and natural features (buildings, roads, ravines, rivers, etc.) as well as elevation changes and land cover. United States Geological Survey Maps are available from many government offices, outdoor shops, and map stores, or can be downloaded from the Internet.

**Topographic Turn:** A turn in a trail made by incorporating a topographic feature, such as a knoll or knob of land, to keep the lower section of the trail out of view of the upper section.

**Topography:** The shape and relief of the earth's surface.

**Topsoil:** The uppermost layer of decayed organic matter, seeds, soil, and microorganisms sometimes referred to as the A horizon.

**Trail Bed:** The entire width of the trail that is graded and cross sloped to facilitate drainage, and extends from the inboard hinge point at the base of the backslope to the outboard hinge at the outside edge of the trail.

**Trail Corridor:** The general location of a potential trail alignment.

**Trail Hardening:** The manual, mechanical, or chemical compaction of the trail tread to create a hardened surface that sheets water and resists indentations from traffic.

**Trail Investment:** The total cost of developing, constructing, replacing, and maintaining a trail or trail system.

**Trail Log:** A record of each structure, feature, facility, and improvement along or adjacent to a trail.

**Trail Tread:** The portion of the trail bench intended for user traffic.

**Trail, Loop(ed):** Trail or trail systems designed so that the routes are closed circuits connecting a number of points of interest, giving users the option of returning to the trailhead on a different section of trail than they went out on.

**Trail, Out-and-Back:** A one-way trail on which users travel to a destination then backtrack to the trailhead.

**Trail, Stacked Loop:** Trail or trail systems designed with many loops "stacked" on each other, giving users many options for varied routes.

**Trailhead:** The access point to a trail, often accompanied by public facilities such as a parking area, drinking fountain, restroom, informational signage, and an equestrian or off-highway vehicle staging area.



**Travelway or Trailway:** The outer limits of the trail, extending several feet beyond the top of the cutbank and several feet beyond the outboard hinge.

**Traverse:** To cross a slope horizontally by going gradually up and across in lieu of the more direct up-and-over approach.

**Tread (Treadway):** The actual surface portion of a trail upon which users travel.

**Tread Creep:** Describes a contour trail sagging or sliding down the hill due to user-caused erosion. Specific causes include bushes or trees protruding into the trail from above, exposure of roots from an uphill tree, an improper bench cut, or poor trail flow.

**Trestle:** The mid-span support for a bridge.

**Trio Maintenance:** The set of measures used to maintain a trail, including removal of slough and berm, re-establishment of the designed surface drainage, and brushing to original construction standards.

**Turnpike:** A section of trail tread that is raised above the ground by the placement and compaction of permeable backfill material contained by logs or dimensional lumber. Usually constructed through permanently or seasonally low-lying wet areas with poor drainage.

**Understory:** Vegetation growing below the tree canopy in a forested area.

**Universal Trail Assessment Process:** An inventory process that provides objective information about actual trail conditions.

**Vibratory Plate Compactor (Vibraplate):** An engine-powered, walk-behind machine that powerfully compacts soil and asphalt via a bottom-mounted steel plate, 1.5 to 3 square feet, that vibrates rapidly.

**Voice control (dogs):** Control of off-leash dogs via spoken commands. (“Come”, “leave it”, etc.)

**Waterbar:** A drainage structure (for turning water) composed of an outsloped segment of tread leading to a barrier placed at a 45-degree angle to the trail; usually made of logs, stones, or rubber belting material. Water flowing down the trail will be diverted by the outslope or, as a last resort, by the barrier. Grade reversals, rolling grade dips and knicks are preferred on multi-use trails instead of waterbars.

**Wattle:** A cylindrical tube made of straw, coconut fibers, or other materials that serves as a filtration device to retain sediment and prevent it from leaving the project site for erosion control.

**Wildlife:** Living things and especially mammals, birds, and fish that are neither human nor domesticated.