

How To Build A Trail

Part Two: The Details

Once you've gone through all the administrative and political details of building a trail, you don't just run out with picks and shovels and start digging. Any wise land management agency will require a careful, detailed design specifying exact routing of the trail, structures to be built, and tools to be used. Whether you're a paid contract trail construction crew or an organized group of volunteers, a person with trail building experience must work with the team.

Transportation — getting from here to there — may be the primary purpose of a trail but how many mountain bikers are interested in just getting somewhere? Trails serve a variety of needs: beautiful sights; fresh, clean smells; the sounds of birds, squirrels, elk; a surface for vigorous exercise.

Then there are land management agency's needs. Trails originally existed to get forest rangers and fire fighters to destinations. That purpose is largely gone now but administration needs still place demands on trails, mainly in the form of money.

Trails should not require constant heavy maintenance. Once built, they should require little more than a yearly cutting out of fallen trees. Water should flow off, not down a trail. Increasingly important are the land's needs. For example, trails should steer users away from sensitive soils and critical wildlife habitat.

The following is a brief introduction to the details of trail building. This information is culled from US Forest Service trail building handbooks.

Location

- Use existing trails as much as possible; don't impact land with unneeded construction.

- Route a trail through several ecological zones; don't make it all alpine or all foothills.

- For long distance trails, provide access points to civilization at intervals of a 3-day hike. Where the trail will serve a nearby community, provide access at varying distances and connections to other trails so users can choose different trips of varying lengths.

- The straightest line topography will allow is not necessarily the best course. Meander the trail to meet sources of drinking water, scenic panoramas, historical sites, etc.

- Conversely, route the trail away from elk wallow areas, calving grounds, bighorn sheep spring and winter range; and away from fragile or heavily used areas (like campgrounds).

- Find a way across a fragile or wet area which is no longer than fifty yards, the longest practical length for building an elevated trail structure.

- Avoid safety hazards like steep talus slopes, avalanche zones, high winds or lightning exposure. Exposure on high elevation ridges should not exceed six miles.

- In general, grades should be no steeper than seven percent (Seven foot rise in one hundred linear feet). Steeper grades should extend no more than one thousand feet. Also, do not have long sections at zero grade. Some degree of slope will allow water to run off.

Construction details

- Avoid disturbing the natural ground surface. This will reduce erosion and maintenance. Build the surface up instead of cutting down, where possible.

- Trail tread width should be no less than twenty-four inches wide for horse use, eighteen inches for hiking.

- Trail tread widths should be even wider along a precipice or crossing a steep slope.

- Tread surfacing material should blend with and preserve the

natural environment.

- Remove projecting limbs, brush, downed logs adjacent to and above the trail. For horse trails, the Forest Service recommends clearing obstacles to a width of eight feet and a height of ten feet. For hikers, the figures are six feet and ten feet, respectively. Mountain bike needs fall in between. It may be appropriate to clear even wider to provide better views from the trail.

These specifications cover a primary, heavy duty trail. Bicyclists usually will have no trouble with a much narrower path.

- Retaining walls should be built of rock, if possible. Logs are acceptable when side slopes do not exceed fifty percent. The thickness of the rock wall at its base should be at least twice the height. The wall must sit on a good foundation of stable earth or rock.

- During construction, plan for revegetation of cut and fill slopes, borrow pits or other areas where surface vegetation has been removed.

Water

Water is the enemy of a trail. Surface water flows across natural ground as a sheet, but the trail cuts the sheet and channels water. Water running down a trail surface will quickly erode the tread and eventually cause a gully.

- The easiest way to divert surface water off a trail is to simply slope the tread surface slightly downhill, toward the sideslope.

- It's good to include short sections, called "grade dips" of at least five feet which rise or drop in a grade slightly adverse to the prevailing grade of the trail. Water running on the trail will not flow beyond that section.

- Water bars are usually no more than a good-sized log laid at a twenty degree angle to the trail and fastened in place with stakes. Water bars can also be built out of rock and even some types of soil.

- Culverts can be constructed of aluminum, wood or rock. These cost more in dollars or time than water bars.

- To cross a bog or swampy area, trail builders use complex, turnpike, puncheon, or corduroy construction. Turnpikes utilize material from parallel side ditches to build up the trail base, making water run off the tread surface. Puncheons use treated timber or native logs to elevate the trail tread above wet areas that are not feasible to drain or locate turnpikes in. Corduroy construction is a primitive puncheon, with less elevation and less solid foundation, considered a temporary measure. These difficult structures are utilized only when the trail cannot avoid a wet area.

- To cross a creek, fords are the usual prescription. Fords are usually selected, not constructed. But on better trails, some improvement to the stream bed may be appropriate. Larger rocks can be either moved out of the way, or placed in strategic spots for stepping stones. In fast moving streams, a line of large rocks parallel to the trail and just downstream will cause sand and gravel to accumulate on the crossing path, gradually developing a smooth, level tread through the water.

Bridges are usually too much expense and are inappropriate in wilderness.

Signage

Good signs or direction indicators can make the difference between a usable fun trail or a harrowing bushwhack. On the other hand, the more signs, the less wild. Blazes, cairns, stakes, or ribbons should designate the route wherever the path tread may become indistinct. Typical places where this is necessary are meadows, tundra, bogs. Signs should be drawn to clearly indicate different directions. This may require two pieces of wood on the same post.

Tools

- Hard hats: safety first!
- Shovels: round point with long wooden handle
- Picks: Point and chisel ends
- Pulaski: Four pound head, with one end pointed, the other broad; used for grubbing
- Measuring wheel

- Saws: Chainsaw in non-wilderness; manual in wilderness or where transportation difficult
- Pry bars: 1 1/2" by six feet, heavy metal
- Big hammers or mallets
- Axes
- Wedges: to secure handles on axes, pulaski, picks
- Sharpening stones for axes

- Fence pliers
- 100 feet tape measure (The US Forest Service can supply most of the hand tools for volunteer trail building on National Forests.)
- Small track-mounted machines; e.g. Morrison Trailblazer, Case 350 tractor
- Rotocat, a motorized grader, without a rider, which excavates and removes material as it proceeds

