



Building a Trail Network through Volunteers

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A little about ourselves



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Why build trails?

- ▶ To allow the public to experience and appreciate our public lands, while minimizing the impact on the landscape.
- ▶ Create a positive recreation experience that bonds the user with the land.



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When I say Trail...

- ▶ Shared use
- ▶ Non-motorized
- ▶ Natural surface
- ▶ Primarily singletrack



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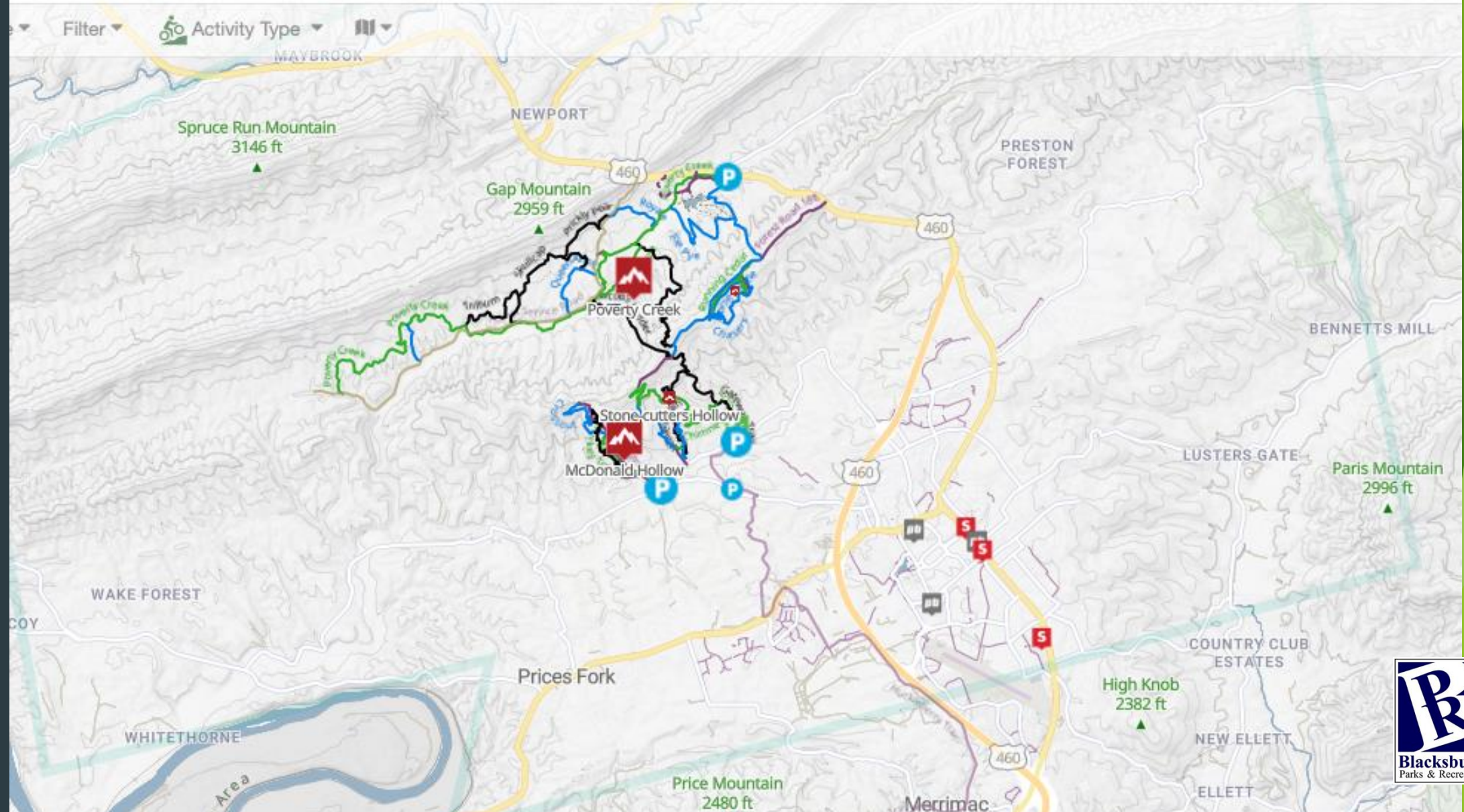
Why does proper trail planning, design, and construction matter?

- ▶ Increases user experience and enjoyment
- ▶ Decreases initial cost of construction
- ▶ Protects natural and cultural resources
- ▶ Decreases costs of long-term maintenance



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Blacksburg Mountain Biking Trails / city region

[Overview](#)[Areas](#)[Trails](#)[Routes](#)[Status](#)[Reports](#)[Photos](#)[Videos](#)[Events](#)[Ride Logs](#)[Trail Usage Stats](#)[More ▾](#)

The lay of the land



Background on the Brush Mountain Trails

- New River Land Trust received a grant from Virginia Outdoors Foundation (VOF)
- NRLT purchased 200 acres, developed conservation easements to overlay the track of land and created a trails plan
- Town formed a stakeholders group for input
- NRLT built the trails (contractor & volunteers)
- Town did in-kind services
- NRLT transferred land back to the Town



Background on the Brush Mountain Trails

- This process worked so well that we have copied it 2 additional times for a total of 600 acres.
- Poverty Creek Trail Coalition is a volunteer group of mountain bikers, who work with trail runners and horseback riding groups to maintain and construct trails in Blacksburg.
- They can be more efficient on moving a downed tree or building a trail than Town crews.

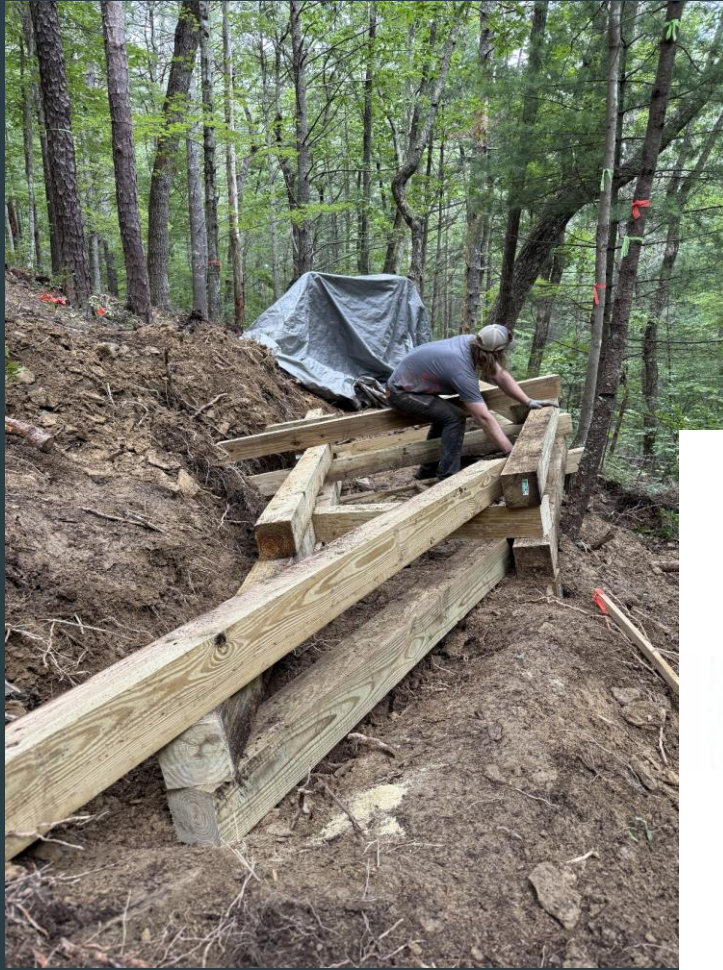


Partnerships and oversight

- Contract with PCTC
- Natural Lands & Parks Coordinator



Background on PCTC and Brush Mountain Project



PCTC is not a typical volunteer group



PCTC contributions Over 750 volunteer hours



Equipment and knowledge

Focus Areas of PCTC Work

- Maintenance
- Reroutes
- Downed tree removal
- Trail erosion
- New Trail Construction



Advanced skills contributed

As needed lumber production



Rock armoring on Reroute



The 2025 project

- SMT conducted a trail assessment of all Brush Mountain Trails
- Also conducted a sustainable trails workshop for staff and volunteers
- Used the assessment for support in a grant application



Goals of the Project

- Provide a base level understanding of sustainable trail principles to staff and community.
- Assess current conditions of existing trails
- Make maintenance recommendations, including approaches to future practices





TOWN OF BLACKSBURG TRAIL ASSESSMENT

Spring 2025

PREPARED BY
SMALL MOUNTAIN TRAILS

PREPARED FOR
Blacksburg
Parks & Recreation

Name Box	reviewed	Difficulty Rating	Condition	Property	Length	Notes	Areas of concern and recommended options
							moved further down the hill.
Ida May		Green	Fair	McDonald Hollow	3448 ft	Ida May is a slightly more advanced Green trail. Because it intersects with Highway three times, it is possible to treat the upper and lower section as different trails.	Reconstruction: The turns on the lower section are difficult to navigate in a down hill direction and should be reworked, particularly the cribwalled switch back, the exposure on that edge creates a challenge to less experienced riders. On the upper section, the section past the coal turn is very flat and should be reconstructed. All of the turns need attention. This is best achieved by professional contractor.
Turkey Trot		Green	Fair	McDonald Hollow	3307 ft	As the upper most of the Green trails, Turkey Trot has the opportunity to be slightly more challenging than Ida May and Pine Tree.	Reconstruction: Much of the bench exceeds the 30" width, making it difficult create functional drains. Additionally, several of the turns do not function as intended for a Green Trail. On one turn in particular, the turn seems to work more as a social entrance for a section of Blunderbuss, and thus fails the majority of users. This is best achieved by professional contractor.
Wilkes Wood		Blue	Fair	McDonald Hollow	3140 ft	Wilkes Wood is the lowest elevation blue trail in McDonald Hollow and is an appropriate transition from the lower green trails in terms of character. The trail is slightly narrower with more texture, but overall is smooth progression from the Green trails	Reconstruction: certain sections did not seem to be have been completely constructed, so could use more bench work and more reversals. The intersection with Blunderbuss has degraded and should also be rebuilt.
Highway		Road	Good	McDonald Hollow	10560 ft	Highway serves as the backbone of the McDonald	As needed: Because of the traffic, there are sections of the road that are starting to show erosion issues, in particularly the upper intersection with Ida May. Consider rebuilding grade.



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Essential Elements of Sustainable Trails



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Sustainable Trails



A sustainable trail allows users to have a natural experience with minimal impact to the ecosystem



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Sustainable Trails



Physical Sustainability:

- ▶ Keeps user impact to “limits of acceptable change”.
- ▶ Provides a stable, non-eroding trail tread.

Social Sustainability:

- ▶ Provides positive user experience.
- ▶ Proper design minimizes user conflict.

Economic Sustainability

- ▶ Plan for minimal maintenance.



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Trail sustainability is all about design

- ▶ Good design is critical for effective maintenance
- ▶ User conflict can be mitigated by design
- ▶ Good construction is worthless without a sustainable alignment
- ▶ Don't throw away money and labor on a bad alignment

Successful trail maintenance relies on good design



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Know your users



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User Conflict is goal interference



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Trail erosion is caused by a combination of trail use,
water, wind and gravity



**Not a Trail*



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Think like Water

1. Water always goes downhill on the path of least resistance
2. With enough volume and/or velocity water will move soil (erosion)
3. Water doesn't easily change directions
4. Water clings to surfaces and itself



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Fall Line

- Fall line is the steepest route of descent down a slope.
- Water will travel down the fall line.
- *There is no fix for a trail built on fall line.*



Contour trail



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5 Essential Elements of Sustainable Trails

- #1 Half Rule
- #2 Average Grade
- #3 User-Based Erosion
- #4 Outslope/Camber
- #5 Grade Reversals

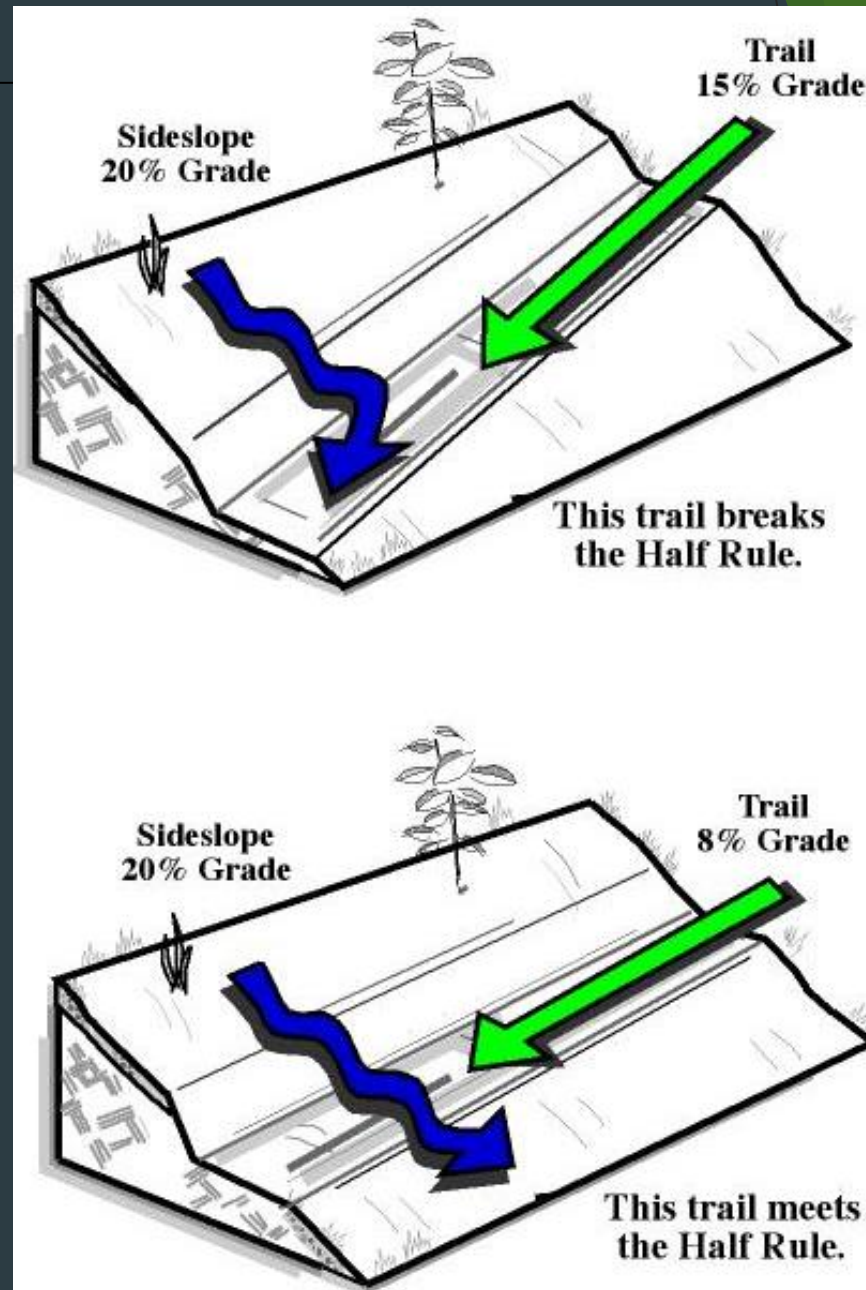


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1 The Half Rule:

The trail tread grade should be less than half of the grade of the side slope.

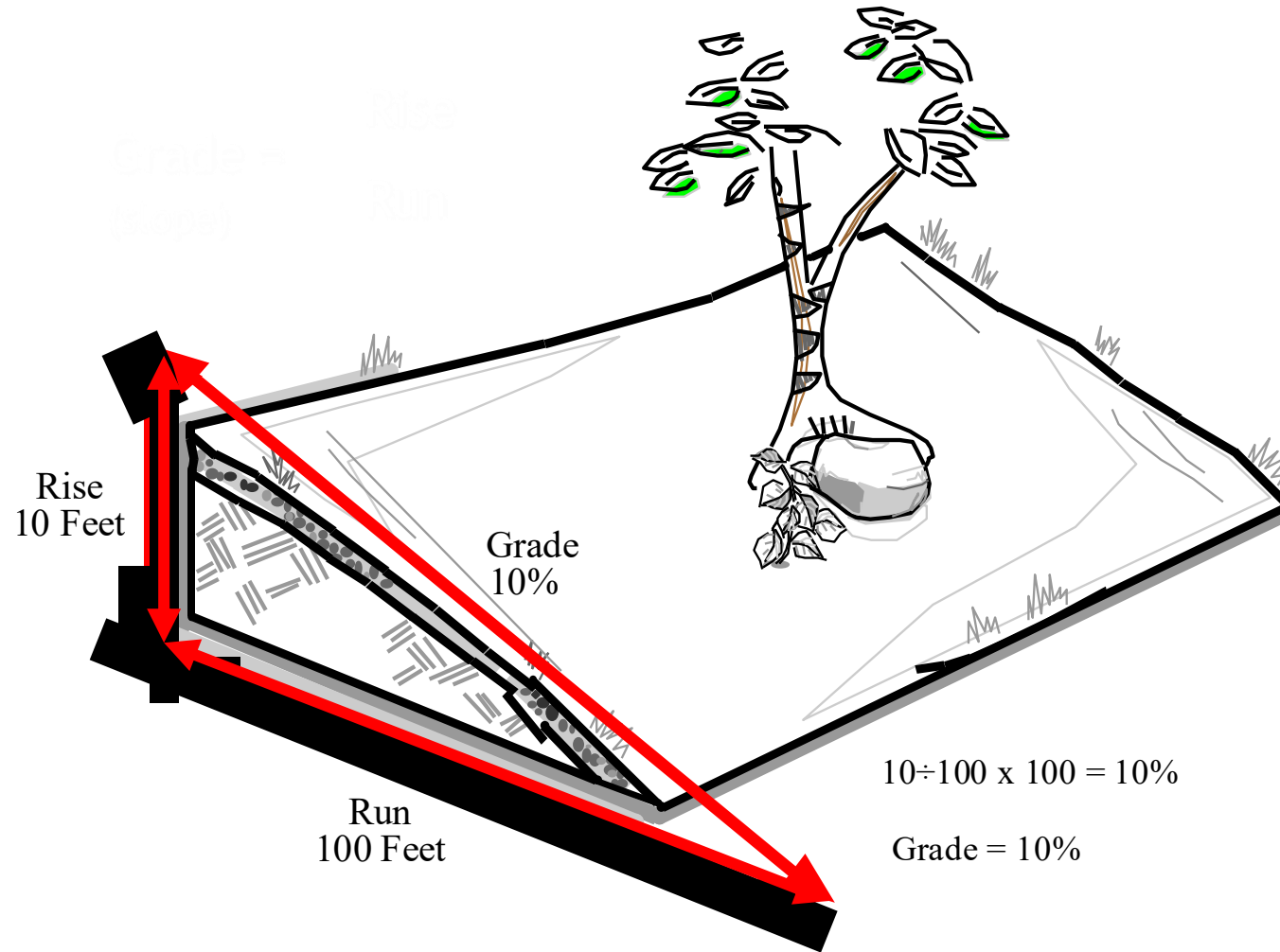
This keeps water from diverting down the tread.



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What is Grade?

What is Grade?



We measure grade with a clinometer

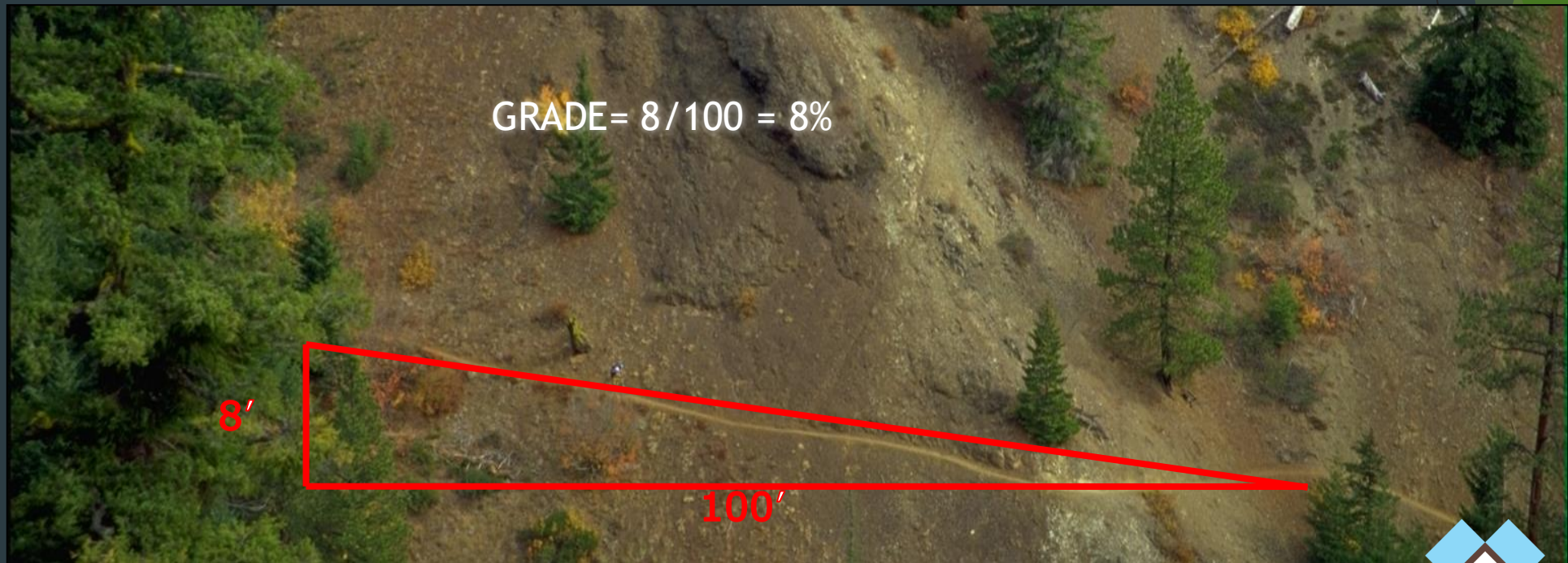


#2 Average Grade

When designing trail, keep the overall grade less than 8% to:

Aid planning, accommodate soils, minimize user-based erosion, help future re-routes

Steeper isn't always faster

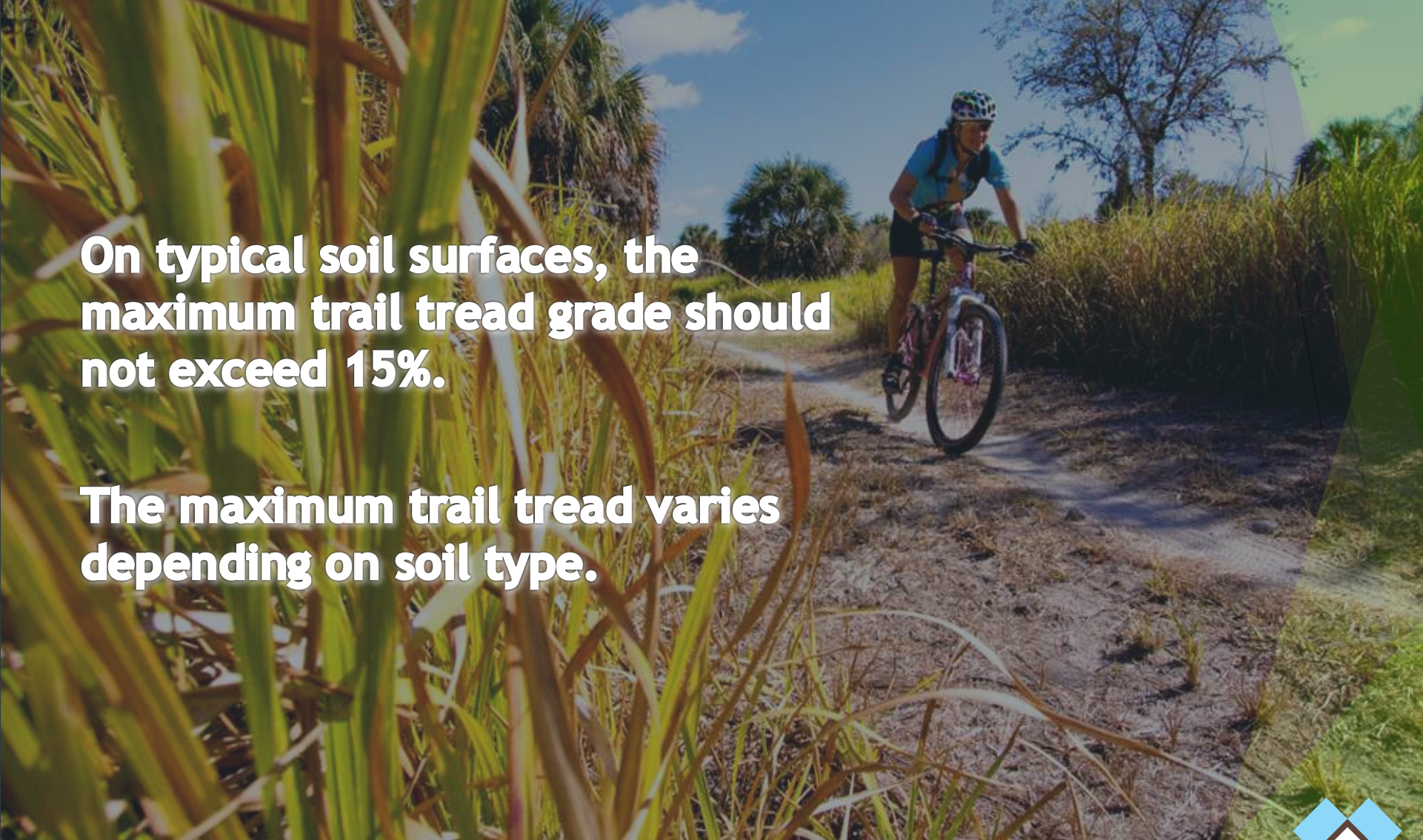


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#3 User-Based Erosion

On typical soil surfaces, the maximum trail tread grade should not exceed 15%.

The maximum trail tread varies depending on soil type.

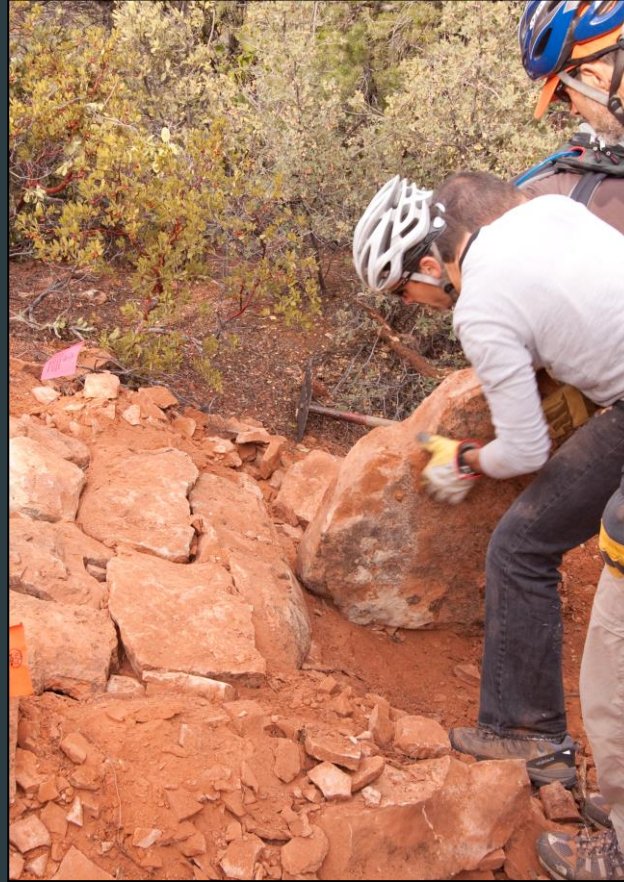


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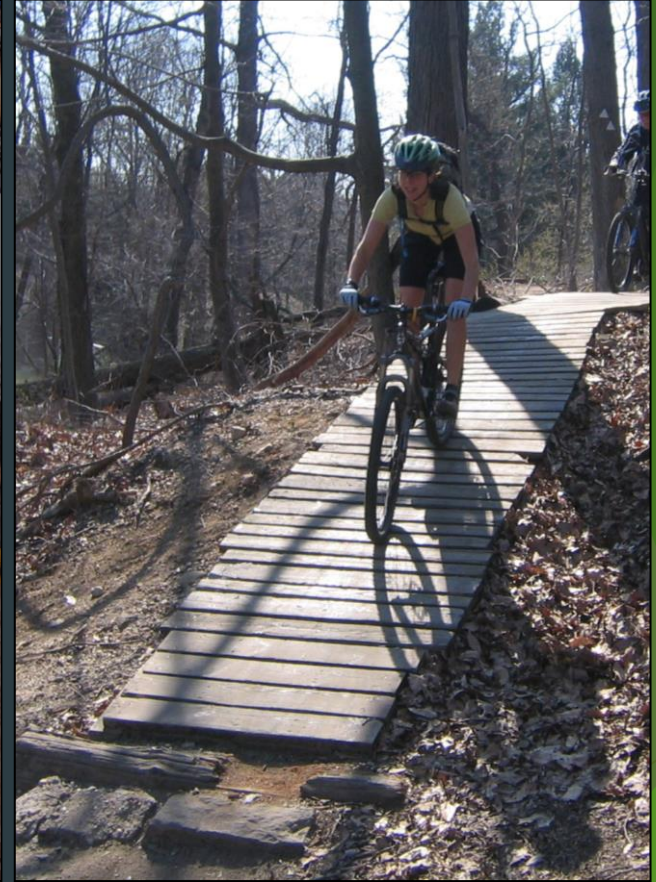
Exceptions to the Guidelines



Natural Rock



Armored Sections

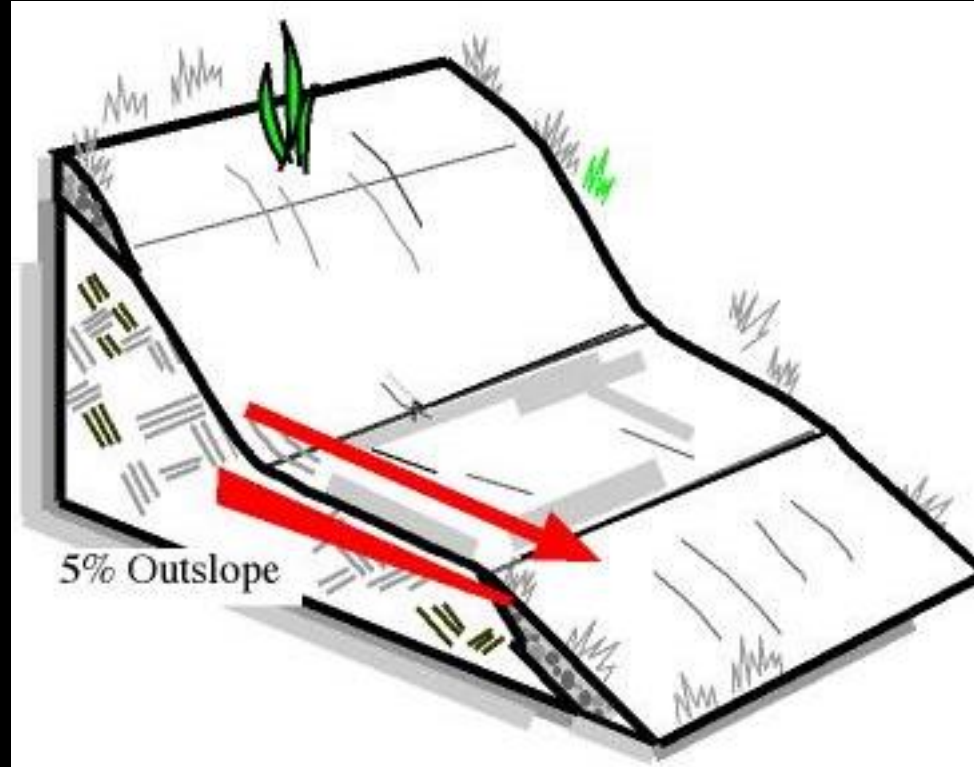


Built Structures



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#4 Outslope

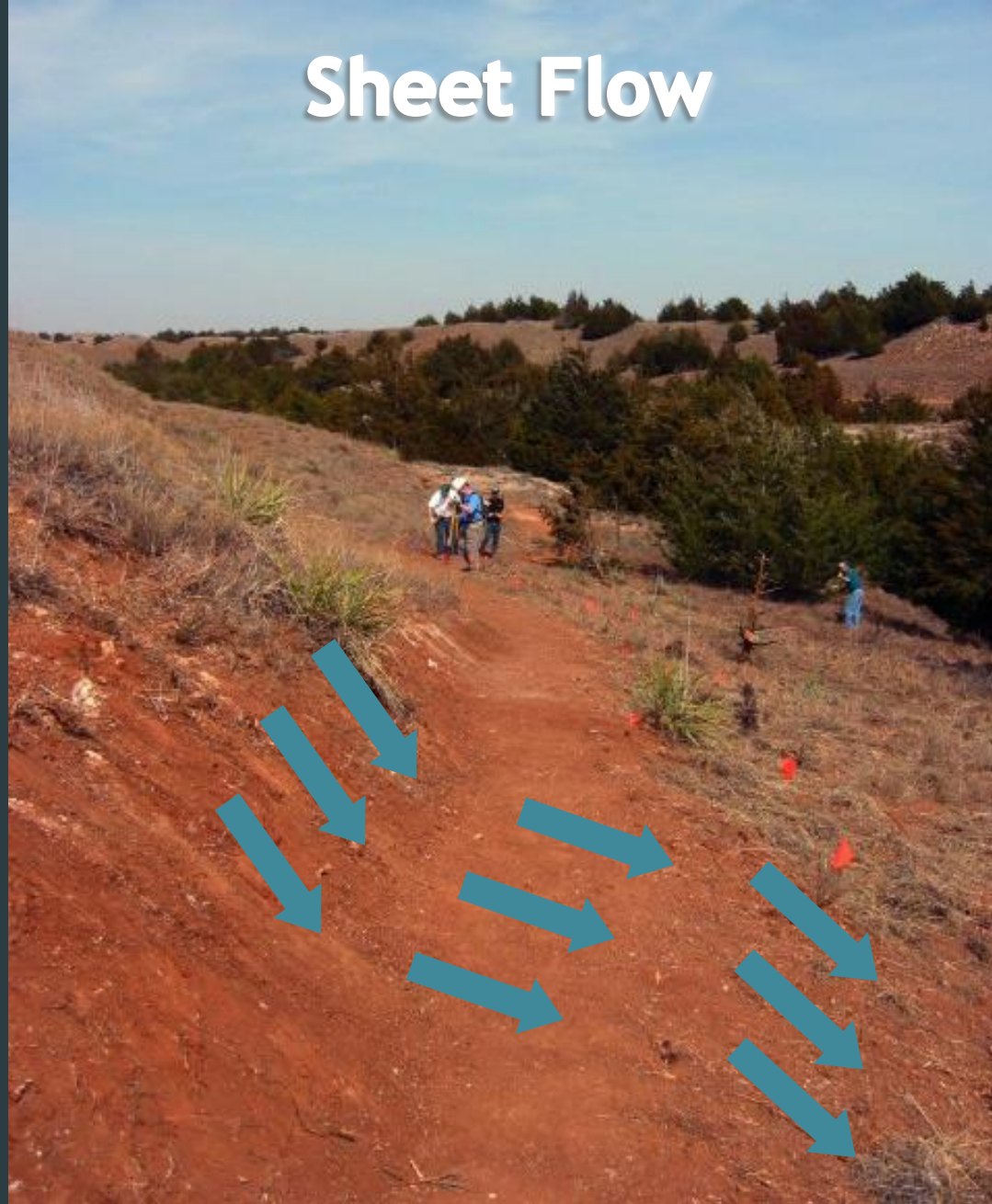


When built, the trail tread should be outsloped by 5% to allow for the sheet flow of water



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Sheet Flow



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Exceptions to outslope

- Tilt and Lift
- Oppositional Forces
- Basin and Rise



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#5 Grade Reversals

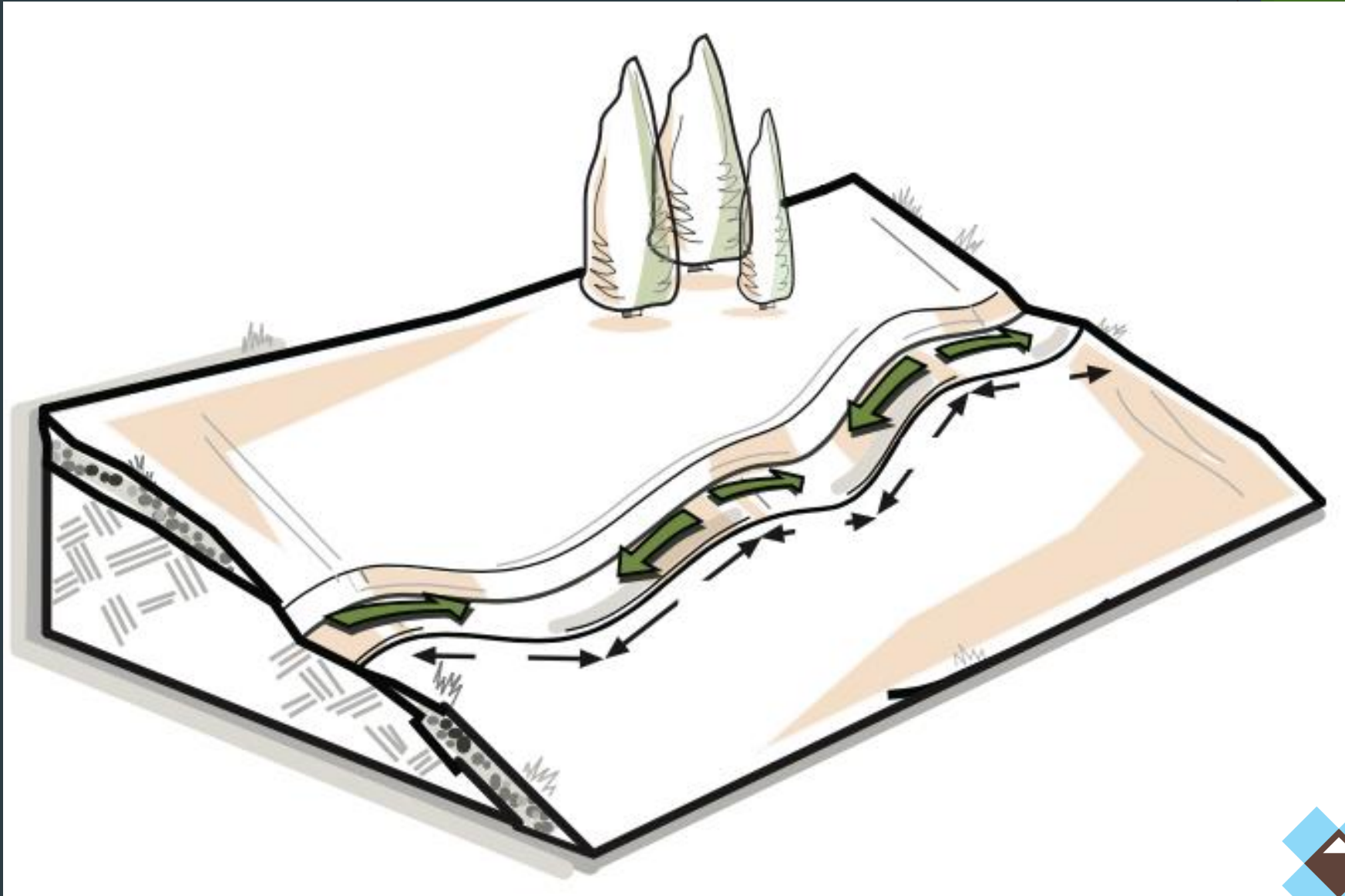


Create watersheds along the trail



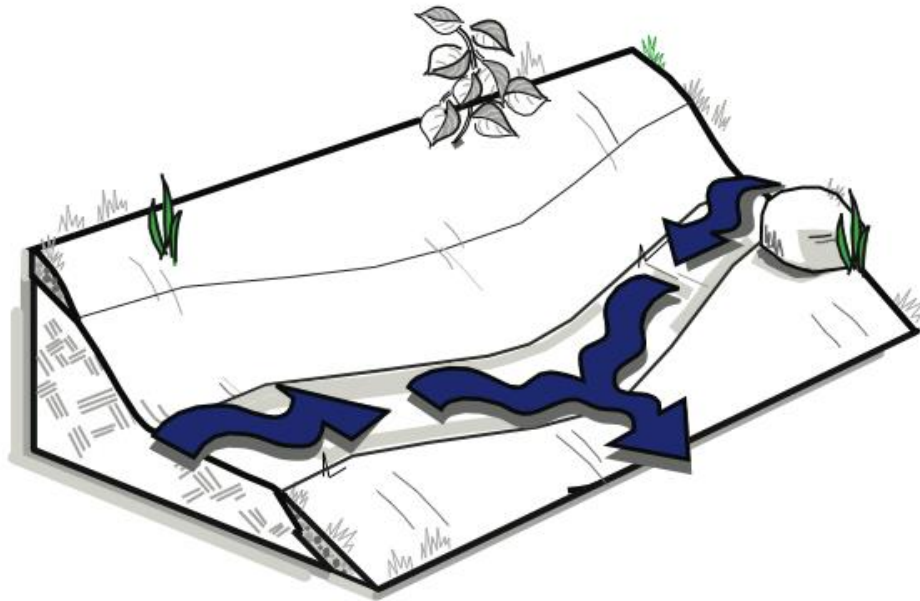
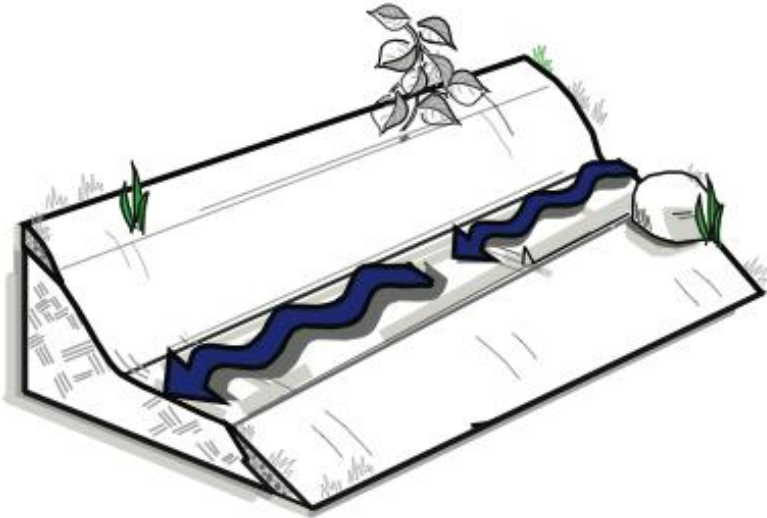
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Grade Reversals



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Grade Reversals



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Volunteer Management: Keys to Success



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Fish Bowl Projects



- Have a work plan and be prepared
- Plan projects that cater to volunteers
- Pick a project with a clear end in one workday
- Include different tasks for a variety of skill levels



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Share Knowledge

- Tell them why the project is important
- Empower them with knowledge
- Pick projects that teach new skills and builds their understanding



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Take Care of Them



- Safety Talk
- Food and water
- Manage beginners

- Empower crew leaders
- Explain and reinforce



Meet volunteers where they are at, instead of waiting for them to find you

Show Appreciation



- Tell them why it matters that they are volunteering
- Emphasize partnerships
- Log volunteer contributions (hours and the \$\$ amount)

Thank You!

