



215.247.0417 // fow.org



Natural Surface Sustainable Trail Design and Construction

Introduction

- John Holback – Field Operations Manager at Friends of The Wissahickon (FOW)
- What's FOW?
 - “To conserve the natural beauty and wildness of the Wissahickon Valley and stimulate public interest therein.”
 - Founded in 1924
 - Oldest and only professionally staffed friends group in the city
 - Community based non profit
 - Field work is mostly volunteer driven



Wissahickon Basics

- Watershed Park Founded in 1868
- Contains 6.8 miles of Wissahickon Creek
- 50+ Miles of Natural Surface Trails
- 1800 Acres
- ~1.2 millions visits per year
- Facing increased pressure



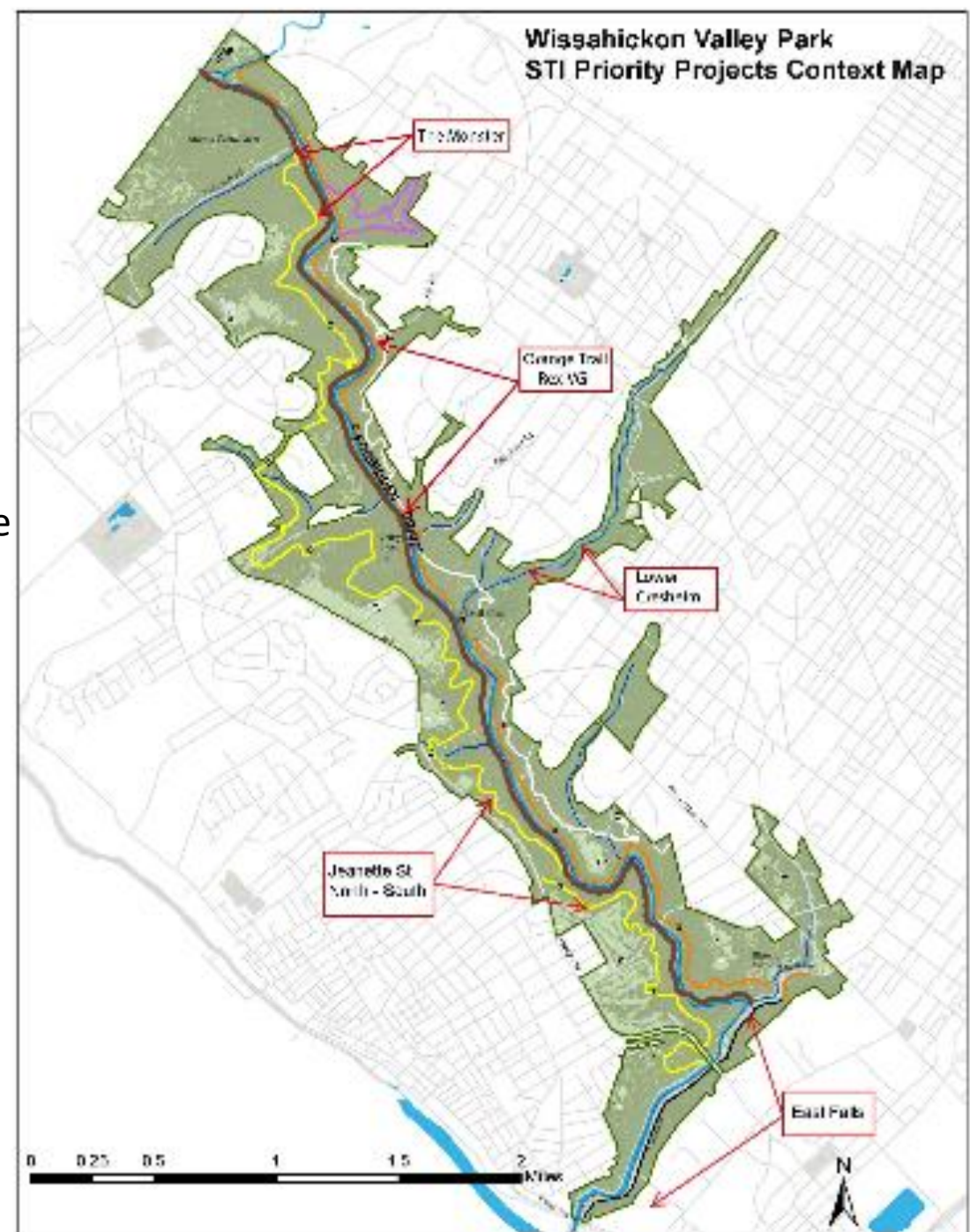
Sustainable Trails Initiative

- What is it?
 - “STI is a multi-stage commitment by FOW to help make the 50 miles of natural surface trails in the Wissahickon Valley Park an environmentally and socially sustainable system that works for all park users.”
- How we did it
- STI Goals
- What we’ve done so far
 - 16 Miles built/made sustainable
 - ~5 Miles Closed/restored
- Follow up in 2017 to reassess



2017 Follow Up

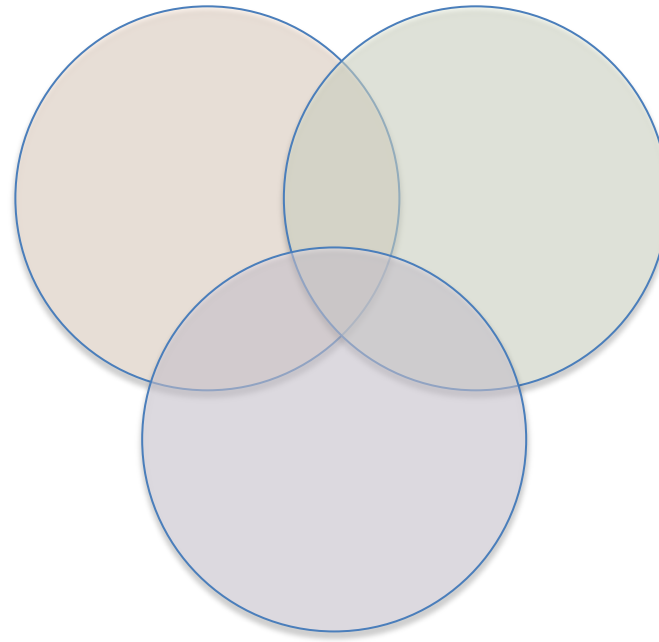
- Chris Bernhardt - Sentieros Consulting
- Full Circle
- Assessment Report
 - Includes priority projects
- Complete the “initiative” and move into the next phase
 - Programmatic trail maintenance
 - By 2020



What is Trail Sustainability?

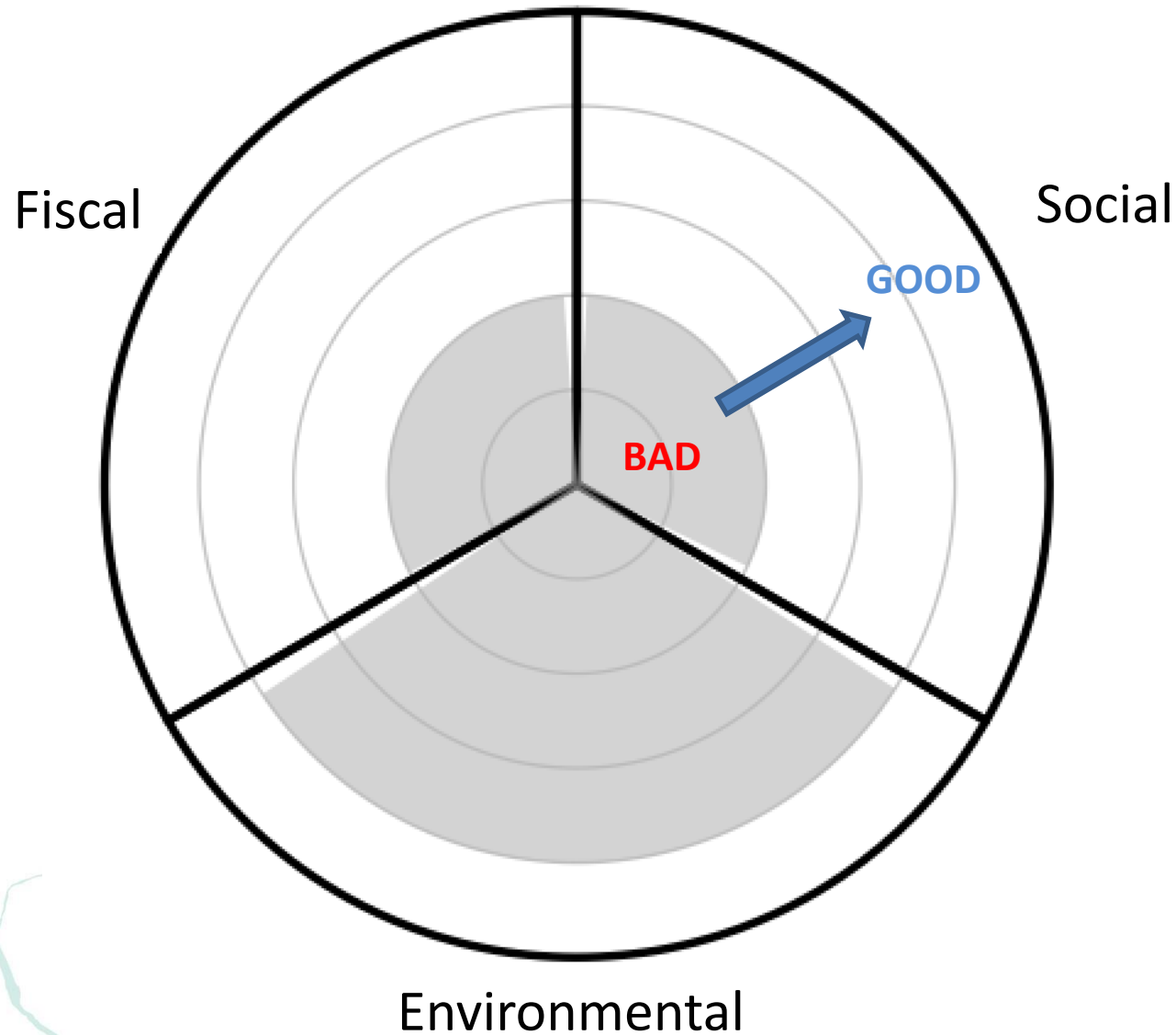
Fiscal

Social



Environmental

What is Trail Sustainability?



Park Use



Main User groups:

- Pedestrians
- MTB
- Equestrians

Other groups:

- Anglers
- Bird Watchers
- Trail Runners
- Dog Walkers
- Rock Climbers
- Sports Teams
- Cross Country Skiers
- Geologists
- General Outdoors Folks
- Etc, etc, etc...

Basic Trail Types

Fall Line Trail = Not reasonably sustainable



Contour Trail = Sustainable!



Sustainably Elements

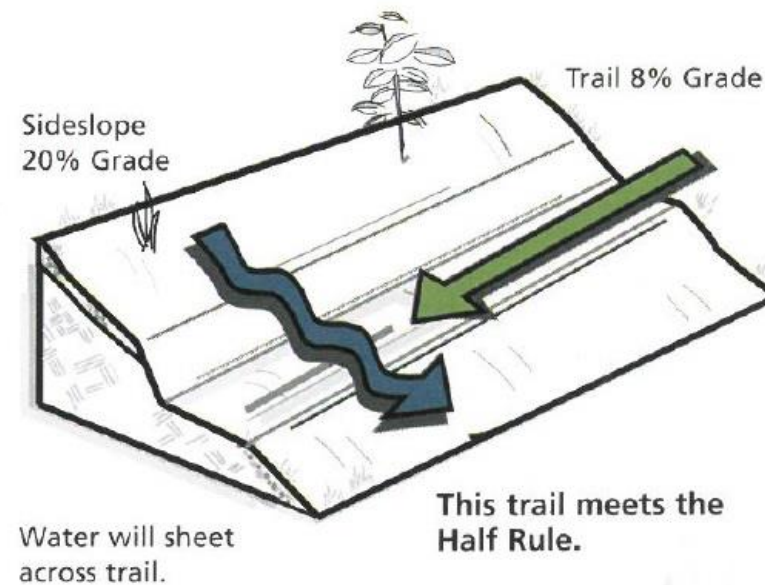
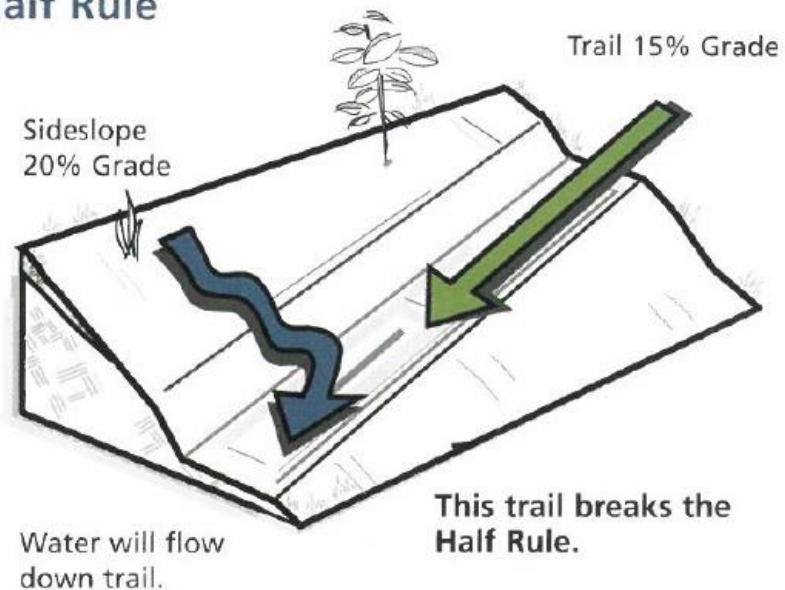
The Five Essential Elements of Trail Sustainability

1. The Half Rule
2. 10% Average Guideline
3. Maximum Sustainable Grade
4. Grade Reversals
5. Outslope



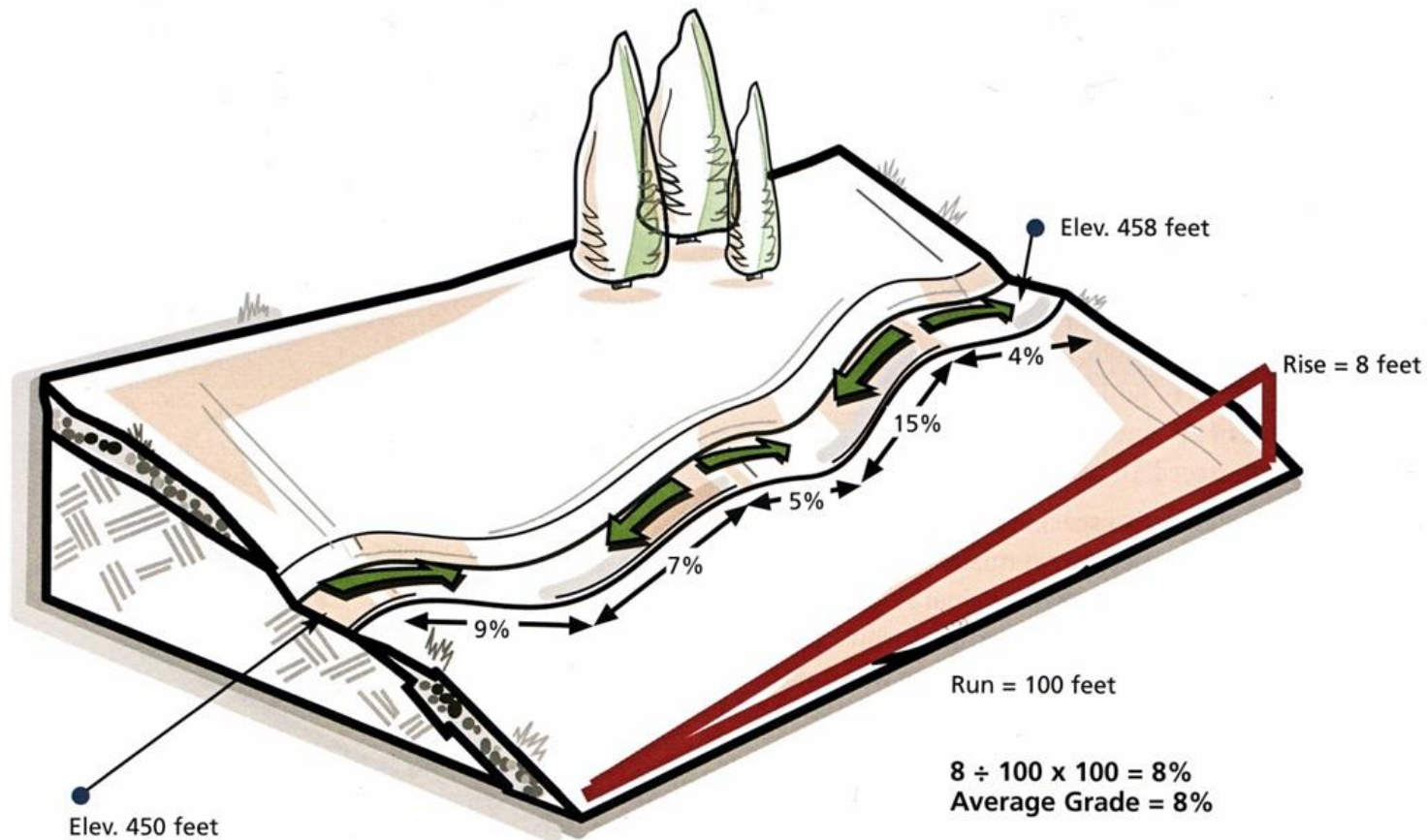
The Half Rule

Half Rule



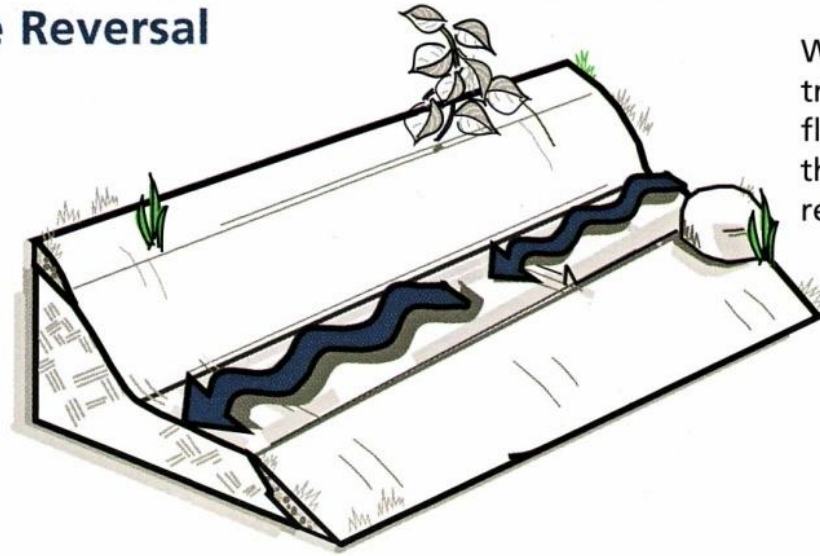
10% Average Grade

Average Trail Segment Grade

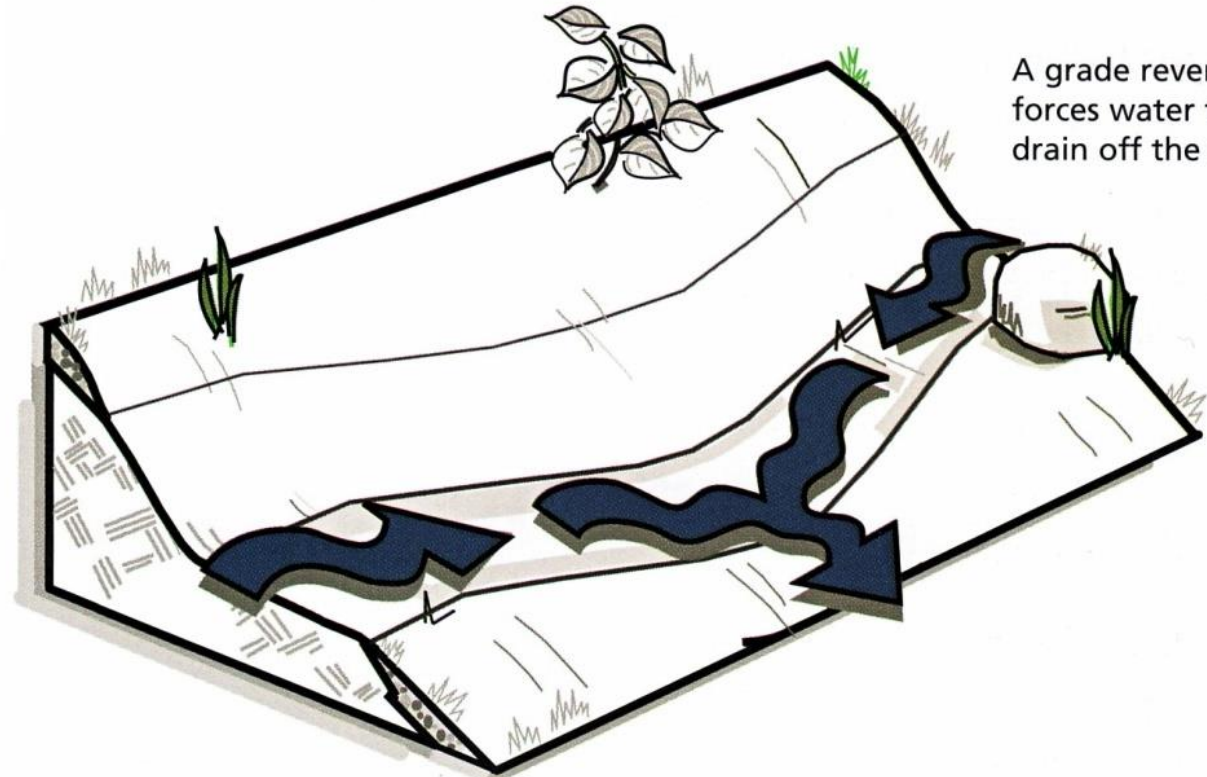


Grade Reversals

Grade Reversal



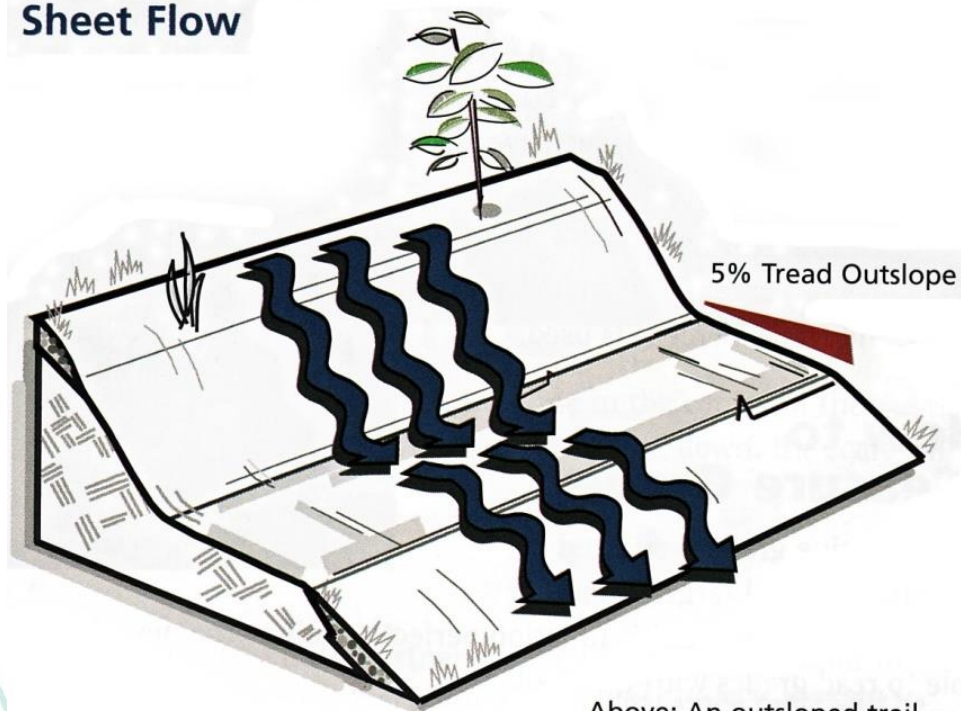
Water may become trapped on trail and flow long distances if there are no grade reversals.



A grade reversal forces water to drain off the trail.

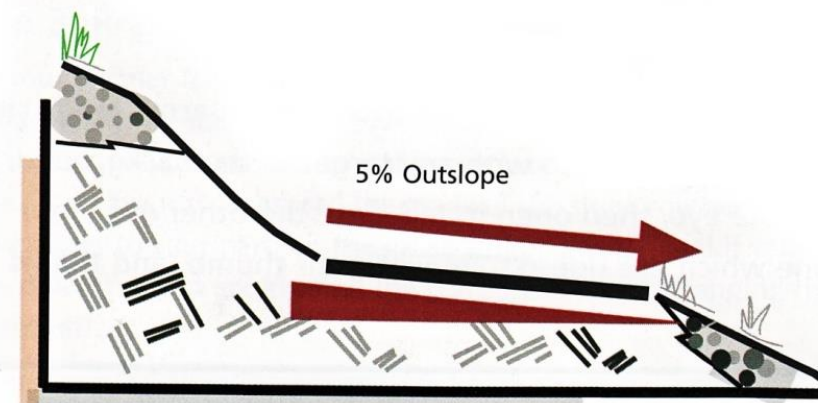
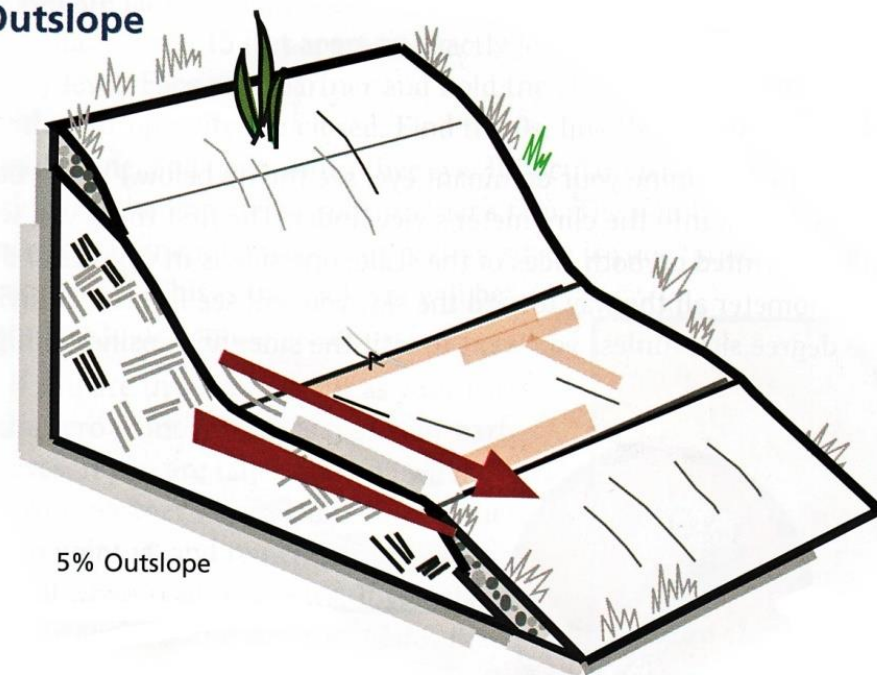
Outslope

Sheet Flow



Above: An outsloped trail tread allows water to drain in a gentle, non-erosive manner called "sheet flow."

Outslope



Natural Surface Trails Construction 101

- Get permission
- Who will be designing and building?
 - Professional
 - Volunteer
 - **Both**
- How will they be building?
 - Mechanized vs. Hand built
- Use a clinometer
- Use pin flags or flagging tape
 - Wait for leaves to be down
- Spend **a lot** of time laying out the trail
- Visit site in the rain
- Set up trail counters
- Follow the “rules” and know what to do when you have to “break” them

Next Steps

- ????
- What
- **WHY???**
- Where
- Who
- When



Additional Recourses

Organizations:

- FOW
 - www.fow.org
- International Mountain Bike Association
 - www.imba.com
- Appalachian Mountain Club
 - www.outdoors.org
- Professional Trail Builders Association
 - www.trailbuilders.org
- American Trails
 - www.americantrails.org
- Forest Service
 - <https://www.fs.fed.us>



FRIENDS
— OF THE —
WISSAHICKON

Let's be friends.

Books:

- [Trail Solutions](#) - IMBA
- [Lightly On The Land](#) – SCA
- [Trail Building & Maintenance](#) - AMC
- [Appalachian Trail Design and Maintenance](#)

Professionals

- Terra Firma Trails
- Vallerie Naylor Trails Specialist
- Tahawus Trails

Volunteer Groups

- Friends of Cresheim Trail
- Belmont Plateau Trails Alliance
- Jolly Rovers