



S.M.A.R.T.E.R. TRAILS

DEFINING TRAIL SUSTAINABILITY



CREATING LEGACY SUSTAINABLE TRAILS INSTEAD OF MANAGEMENT NIGHTMARES



DEFINITIONS AND SIDEBARS:

- A trail is a linear outdoor recreational facility and like other facilities needs good planning/design, implementation, upkeep and maintenance
- Trails are a valuable resource to all who use them no matter of what travel modality they choose to experience the trail with
- Trails should be (but often are not) a linear area of focused impact
- Trails are passive recreation (dispersed recreation)
- There are many different types of trails with different designed experiences, difficulty levels and management objectives

TRAIL DEVELOPMENT HAPPENS IN ONE OF THREE WAYS:

- User created social trails (on the ground, but not recognized as a trail by the agency and not in the formal trail inventory). They may happen informally, or be purposely build to serve a specific need.
- Adopted from some prior use of the corridor (extraction routes such as timber or mineral extraction, old roads, rail-lines etc.)
- Purpose Built Official Trail (PBT- trails that start their life as trails and are planned/designed/approved and built for recreation)

S.M.A.R.T.E.R. TRAILS

- Sustainable, Manageable, Artistic Recreational Trails that are Ecologically Sound and have a good Risk Management Strategy.



MA DCR-TRAILS GUIDELINES AND BEST PRACTICES MANUAL

- **Importance of Trails**

- Trails contribute significantly to the Commonwealth's health, economy, resource protection, and education.
- Trails connect people to the natural environment: place to place, person to person, and neighbor to neighbor.
- Trails connect us to scenic landscapes, natural wonders, and cultural resources. They make our communities more livable: improving the economy through tourism and civic improvement, and building support for land protection and stewardship.
- Trails provide opportunities for multiple-use recreation: promoting physical activity to improve fitness and mental health. They provide access for other recreational opportunities such as hunting or rock-climbing. They enhance educational opportunities: providing opportunities to improve and test skills, to be challenged, or to learn about our natural or cultural environment.
- Trails present opportunities for observation, enjoyment, and exploration.
- Trails strengthen each of us: offering opportunities for solitude, contemplation, and inspiration. To some, trails provide a sense of freedom, personal accomplishment, self-reliance, and self-discovery.
- Trails can even help protect rare habitats and sensitive resources: by concentrating use on designated, sustainable pathways.

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MA DCR-TRAILS GUIDELINES AND BEST PRACTICES MANUAL

- For the DCR, trails are the intersection of conservation and recreation. They are one of our most used facilities. They deserve a high level of attention.



NATIONAL PARK SERVICE SUSTAINABLE TRAILS DEFINITION

- “Sustainability of backcountry trail corridors is defined as the ability of the travel surface to support current and anticipated appropriate uses with minimal impact to the adjoining natural systems and cultural resources. Sustainable trails have negligible soil loss or movement and allow the naturally occurring plant systems to inhabit the area, while allowing for the occasional pruning and removal of plants necessary to build and maintain the trail. If well-designed, built, and maintained, a sustainable trail minimizes braiding, seasonal muddiness and erosion. It should not normally affect natural fauna adversely nor require re-routing and major maintenance over long periods of time.”

NPS TRAIL SUSTAINABILITY

- Minimizing impact to natural, historic, cultural, scenic and aesthetic resources is a foundational premise of NPS management decisions. Careful analysis and design is required to fit trails into backcountry areas of national parks with minimal impacts. Sustainability of backcountry trails is as much an **art as it is a science**. Management analysis of the sustainability of backcountry trails is based upon the physical capacity of the land to support the intended visitor use.



Teddy Roosevelt National Park- ND



Trails did not meet the traditional definition of sustainability



Lesson learned: site specific conditions have to be understood and focus can not always be on physical sustainability only

IMBA TRAIL SOLUTIONS (2004)

IMBA'S GUIDE TO BUILDING SWEET SINGLETRACK

- The core elements of a sustainable trail - A sustainable trail:
 - Protects the environment
 - Meets the need of it's users
 - Requires little maintenance
 - Minimizes conflict between different user groups
-
- If any one of these four values is overemphasized at the expense of another, the trail will cause irreparable damage to the environment, provide an unsafe or negative experience for visitors, or deplete your maintenance budget.

MA DCR-TRAILS GUIDELINES AND BEST PRACTICES MANUAL (2012)

- To be successful, a trail must be designed to be physically, ecologically, and economically sustainable.
- Physical Sustainability- Designing trails to retain their structure and form over years of use and under forces of humans and nature is a key factor in sustainability. Trail use promotes change, so trails must be designed in anticipation of change to ensure that they remain physically stable with appropriate maintenance and management.
- Ecological Sustainability- Minimizing the ecological impacts of trails, and protecting sensitive natural and cultural resources is fundamental in sustainable trail design and development.
- Economic Sustainability- For any trail, the implementing agency or advocacy group must have the capacity to economically support it over its life cycle. Developing and committing to a long-term maintenance strategy is a critical aspect of a successful trail program.

SUSTAINABILITY

- Trail sustainability should not be considered a yes/no proposition, but instead a more/less scenario
- Focusing only on physical sustainability will yield durable textbook trails, but may not produce the trails users desire which can lead to other problems
- Trail users are ever changing in how they use trails and the desired experiences they are seeking
- We have to continue to adapt our view on what sustainable really means but also continue to innovate in trail design, construction and maintenance

WHAT IS A SUSTAINABLE TRAIL?

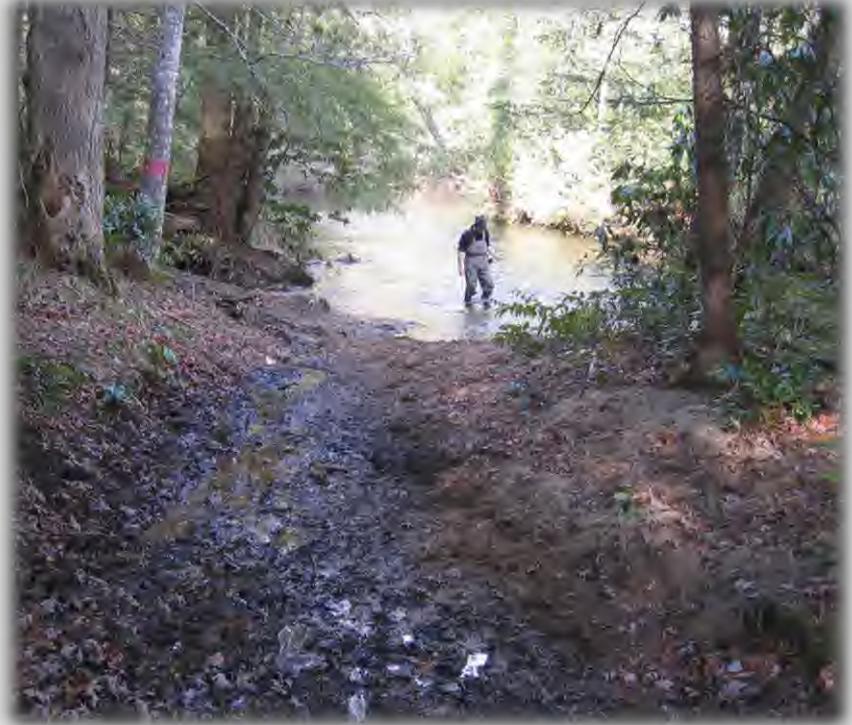
4 Pillars of Sustainable Trails

- Ecological Sustainability
- Physically Sustainability
- Managerial Sustainability
- Social Sustainability



ECOLOGICAL SUSTAINABILITY:

- Trail types that fit into surrounding landscapes
- Right type of trail and users for given area
- Level of impact during development stage appropriate for sensitivity of area
- Level of long term impact of trail commensurate with landscape



This trail is having a large impact on water resources.

PHYSICAL SUSTAINABILITY

- Physical robustness of the trail
- Ability of the trail to shed water thus preventing water based erosion
- Ability of the trail tread to withstand the impacts of permitted users
- Alignment is most important aspect
- Challenged alignments can be mitigated with various techniques: hardening or armoring or elevated wood structures



MANAGERIAL SUSTAINABILITY

- Ability of the land managing agency and its partners to actively manage and maintain the trail
- Where management budgets lack in maintenance money, volunteers can make up deficit with trained volunteer labor
- Regular inspections and assessments of conditions
- Trail decisions (including wet weather closures) based on real time information



SOCIAL SUSTAINABILITY

- Trail system generally meets the needs/desires of the users
- Good variety of trails with a range different difficulties
- Good relationship between users and managing agency
- Design helps to mitigate user conflicts
- If enough and right type of trails are not provided, users will create their own
- Trail systems that “make sense”
- Ease of navigability commensurate with trail system location and type of trails



WHAT IS A SUSTAINABLE TRAIL?

- Ecological Sustainability
- Physically Sustainability
- Managerial Sustainability
- Social Sustainability

Each area of the 4 legs of sustainability is scored on a 1-5 level of sustainability for a total Sustainability Grade.

If one of the legs of the stool is weak or missing, another beefy leg can make up

Variables: User numbers, types of uses, weather patterns, soil conditions, alignment, volunteer support etc.



TRADITIONAL TRAIL DESIGN GUIDELINES

- Rolling contour-sidehill locations
 - Trail under $\frac{1}{2}$ of prevailing sideslope (NPS says $\frac{1}{4}$)
 - Average grade of 10% or less
 - Max sustained grade (15-20% depending on user types and soil conditions)
 - Outslope at 5%
 - Grade reversals or other water management structures such as dips or undulations
-
- All good stuff, but what happens when these guidelines are not met?
 - Do these guidelines provide the variety and difficulty level of trail that many users are looking for?

SUSTAINABLE?



Pictured Rocks
National Lakeshore

SUSTAINABLE?



- Not a sidehill location
- Steeper than 10% average
- Steeper than $\frac{1}{2}$ or sideslope
- Rolling contour?

UNDERSTANDING USER MOTIVATIONS IS IMPORTANT FOR THE TRAIL DESIGN PROCESS



TRADITIONAL DESIGN VS. A MORE INFORMED SITE SPECIFIC DESIGN



SUSTAINABLE?



Beasley Knob OHV trail- USFS lands in GA

TRENDS IN TRAILS

- Lots of different and smaller land managing agencies are getting into trails bring trails closer to the people
- User numbers will continue to increase as population increases and more people discover the benefit of trails (physical and mental health)
- Innovation and creativity of equipment and gear will continue to influence how we use trails

USERS ARE EVER CHANGING AND WE NEED TO ADAPT TO SERVE THE NEEDS/DESIRES OF AN EVER GROWING TRAIL POPULATION



Fat bikes
E-mountain bikes

ORV- ATV- SIDE BY SIDES



EVEN TRAIL BASED PEDESTRIANS ARE EVOLVING

Grouse Grind Guide

TRAIL

LENGTH: 2.9 km (1.8 miles)

ELEVATION GAIN: 853 meters (2,800 feet)

TOTAL STAIRS: 2,579 steps to CN Tower VS 2,830 steps to the Top

HIKERS ANNUALLY: 100,000

MOUNTAIN

FIRST HIKERS: 1894

HIKERS ANNUALLY: 1.2 million

TOP: 1,231 m (4,039 ft)

BASE: 274 m (899 ft)

ESSENTIALS FOR FIRST HIKE

Light sportswear

Quality shoes

Enough fluids

Energy bars and fruit

Take your cell phone

Start slow

- Average Climbing Time: 1.5 hr
- Official Record: Men 25:01 min, Women 31:04 min
- Most climbs in 24hours: 14 (by Sebastian Albrecht)
- Burned Calories: 13,000 = 52 x

SOURCES: <http://www.grousemountain.com/>
http://en.wikipedia.org/wiki/Grouse_Mountain

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CROSSFIT ABBOTSFORD
WORKOUT OF THE DAY
SATURDAY JULY 21 2012

"MOTHER NATURE'S STAIRMASTER"

9TH ANNUAL KELLY COLE MEMORIAL
GROUSE GRIND
PRESENTED BY CORE FITNESS & REHAB



Image © 2010 DigitalGlobe
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Image © 2010 Province of British Columbia

Imagery Dates: Aug 31, 2002 - Apr 4, 2009

49°22'23.82"N 123°05'30.30"W elev 526 m

© 2010 Google

Eye alt 784 m



GROUSE GRIND



TRAIL INNOVATION

- In many ways, the bulk of trail innovation is coming from trail designers/builders working with smaller land managing agencies instead of federal or larger agencies
- New materials, methods and understanding are driving the innovation and progression of trail design
- Increasing user numbers will tax older trails with less than good designed alignments and there will be a need to innovate solutions without relocation as an only tool
- User types and desired experiences will push planners/designers to continue to innovate and adapt
- The US is falling behind many other countries (Scotland, Wales) in trail development and management
- **It is a challenging but exciting time to be involved in trails!**

POOR LOCATION FOR A TRAIL, BUT DUE TO INNOVATIVE DESIGN/
IMPLEMENTATION THIS WORKS WELL



Stairway to Heaven Trail- Copper Harbor MI

AND IS FUN!



TRAIL INNOVATION



TRAIL INNOVATION



TRAIL INNOVATION- DESCHUTES RIVER TRAIL BEND OR



RECOMMENDATIONS

- Get a good education and understand the basics of sustainable trail design
- Involve the public through stakeholders meetings to better understand user needs and desires
- How do needs/desires interface with sustainable trail development practices?
- Consider hiring a consultant to solve your difficult trail management issues
- Develop a Trail Management Plan

TRAIL PLANS



Augusta Canal
National Heritage Area

TRAIL DEVELOPMENT AND MANAGEMENT PLAN




Prepared For:
Augusta Canal Authority
1450 Greene St., Enterprise Mall
Augusta, GA 30601

Contact:
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PO Box 664
Cedar Mountain, NC 28718
Telephone: 828-862-5613



BEASLEY KNOB OHV TRAIL SYSTEM

INVENTORY, ASSESSMENT, AND MANAGEMENT PLAN

CHATTAHOOCHEE-OCONEE NATIONAL FOREST
BLUE RIDGE RANGER DISTRICT

2011



COMPLETED BY:

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COMPLETED FOR:

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Blue Ridge Ranger District
Andy Baker - District Ranger
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Blairsville, GA 30512
Phone: 706-745-6928

ADDITIONAL ASSISTANCE:

Kay-Linn Enterprises, LLC
Applied Trails Research, LLC
Georgia Bounty Runners



Trail Dynamics
art & science of trails





YELLOW RIVER PARK

TRAIL SYSTEM ASSESSMENT AND REDEVELOPMENT PLAN

JULY, 2012

COMPLETED FOR:

Cumbelet County Division of Parks and Recreation
30. Mitchell Drive, Trail and Gateway Plaza
Cumbelet Justice & Administration Center
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Applied Trails Research, LLC






OWL CREEK HORSE TRAIL SYSTEM

TRAIL ASSESSMENT AND MANAGEMENT PLAN

NATIONAL FORESTS OF ALABAMA
WM. B. BANKHEAD RANGER DISTRICT

DECEMBER 2011

COMPLETED FOR:

National Forests of Alabama
Wm. B. Bankhead Ranger District
Mc Elrond Denson, District Ranger
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Double Springs, AL 35553
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With additional assistance from:
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Applied Trails Research




Trail Dynamics
art & science of trails





CAVE RUN NON-MOTORIZED TRAIL INITIATIVE

TRAIL ASSESSMENT AND MANAGEMENT PLAN

DANIEL BOONE NATIONAL FOREST
CUMBERLAND RANGER DISTRICT

MARCH 2011 - AUGUST 2011

COMPLETED FOR:

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James David Manner
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Phone: 606-784-6428



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ADDITIONAL ASSISTANCE:

Kay-Linn Enterprises, LLC
Applied Trails Research, LLC



Trail Dynamics
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THANK YOU FOR YOUR COMMITMENT TO TRAILS!

