ELKINS AREA TRAILS PLANNING & DESIGN

ELKINS, WV

FEBRUARY 2025

TRAIL SOLUTIONS IMBA

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ACKNOWLEDGMENTS

PREPARED FOR:

WVU SMITH OUTDOOR ECONOMIC DEVELOPMENT COLLABORATIVE

ELKINS AREA SHARED TRAILS

USFS MONONGAHELA NATIONAL FOREST CHEAT-POTOMAC RANGER DISTRICT

PREPARED BY:

INTERNATIONAL MOUNTAIN BICYCLING ASSOCIATION – TRAIL SOLUTIONS

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PROJECT TEAM

01

IMBA TRAIL SOLUTIONS

IMBA Trail Solutions is the international leader in developing trails, with experience in over 1,000 projects in North America, Europe, and Asia. Our staff excels at planning, design, and construction of trail systems that provide high-quality experiences for local riders and destination visitors while simultaneously minimizing environmental impacts.

IMBA Trail Solutions is a fee-for-service based arm of the International Mountain Bicycling Association (IMBA), a 501(c)(3) nonprofit organization. IMBA's mission is to create, enhance, and protect great places to ride mountain bikes. Based in Boulder, Colorado, and with staff distributed across the country and the world, IMBA meets its goal to create great mountain bike experiences through its IMBA Trail Solutions program. IMBA Trail Solutions employs approximately twenty professional trail planners and builders. In addition to being industry professionals and exceptional mountain bike riders, IMBA Trail Solutions staff hold a broad base of applicable skills and knowledge from planning, landscape architecture, and environmental sciences to GIS systems, CAD, and graphic design.

Our wealth of experience has allowed us to develop the gold standard guidelines for the creation of both sustainable and enjoyable singletrack trails. These guidelines have influenced all major federal land management agencies and a large number of state and local parks departments. We pride ourselves on the positive experiences IMBA Trail Solutions has provided to the millions of active trail users around the world and on the economic independence that communities have achieved through the development of destination trail systems.

WVU SMITH OUTDOOR ECONOMIC DEVELOPMENT COLLABORATIVE

The mission of the Brad and Alys Smith Outdoor Economic Development Collaborative (WVU OEDC) is to utilize West Virginia's outdoor assets to ignite the state's economy and enhance quality of life for West Virginians through outdoor recreation.

They envision West Virginia's vibrant communities filled with a diverse workforce that enjoys both the outdoors and an innovative state, with a wide range of opportunities that enable the population to stay and thrive.

To achieve this, the Collaborative creates awareness of the state's unique wealth of beautiful outdoor spaces, where citizens and visitors alike can recreate. The Collaborative seeks to create more outdoor recreational access for all ability levels and better infrastructure for mountain biking, hiking, climbing and water areas, along with other outdoor recreation projects. Additionally, the Collaborative develops incentives for businesses and entrepreneurs to move to and remain in the Mountain State.

Their vision includes engaging West Virginia's most asset, their youth. The Collaborative offers invaluable learning experiences to elementary, middle and high school students through the Science Adventure School and Science Behind the Sport. These programs are dedicated to empowering and educating West Virginia's youth through linking outdoor education, recreation and science. Sparking both a love of learning and being outside, the Collaborative provides steppingstones for the next generation of innovators, educators, and outdoor enthusiasts.

By building alliances between West Virginia University, educators, state and local governments, the outdoor industry, and outdoor enthusiasts, WVU OEDC seeks to redefine their state and enhance the quality of life for West Virginian

ELKINS AREA SHARED TRAILS (EAST)

EAST brings people together through the development, stewardship and enjoyment of local trails. Our goal is to lower barriers of entry so everyone in our community has access to and feels comfortable using trails. We want to build a trail system that enhances neighborhood connectivity and recreation opportunities in Elkins to grow confidence, love, and pride of place in all demographics.

USFS MONONGAHELA NATIONAL FOREST CHEAT-POTOMAC RANGER DISTRICT

The Monongahela National Forest (MNF) covers over 920,000 acres in the Allegheny Mountains of West Virginia. There are seven Ranger Districts within the MNF. This project falls within the Cheat-Potomac Ranger District.

INTRODUCTION

02

PROJECT BACKGROUND

Elkins Area Shared Trails (EAST) and partner West Virginia University's Brad and Alys Smith Outdoor Economic Development Collaborative (WVU OEDC) engaged IMBA Trail Solutions along with the USFS Monongahela National Forest Cheat-Potomac Ranger District (USFS) staff in a coordinated trails planning and design process in the Monongahela National Forest. This plan follows the roadmap laid out by the USFS on the Elkins Area Shared Trails Planning Guidance Document issued in April 2023.

The Monongahela National Forest (MNF), at over 900,000 acres, covers a large swath of eastern West Virginia encompassing 10 counties. Located in the Allegheny Mountains this region boasts some of the highest peaks in the state with a diverse range of vegetation and wildlife habitats. There are eight Wilderness Areas within the MNF. The forest also includes Spruce Knob-Seneca Rocks National Recreation Area.

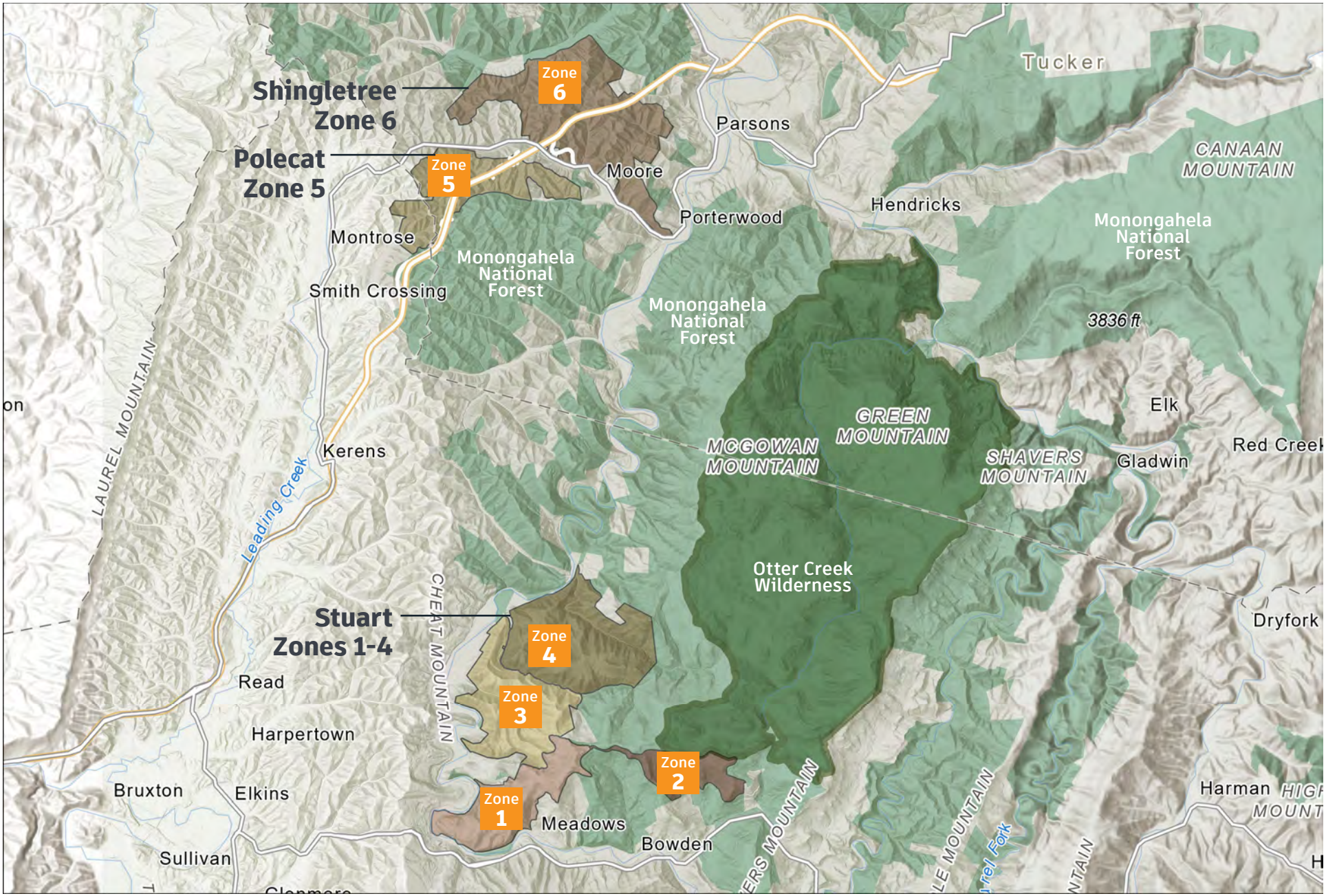
This project focuses on portions of the forest near Elkins and Parsons in Randolph and Tucker Counties. Three project zones were selected for assessment, planning, and design; Stuart – which includes Bickel Knob, Polecat – along the Corridor H corridor, and Shingletree – between corridor H and Clover Run Road. The selected zones lie outside of the Otter Creek Wilderness Area.

IMBA Trail Solutions conducted a site visit in March of 2024 along with members of the project team. During this time, field data was collected to document existing trail conditions along with opportunities and constraints for shared-use trail development. Georeferenced field maps included layers showing existing forest infrastructure, forest management areas, property boundaries, and areas of avoidance. Findings were shared with the project team with discussions that facilitated in the development of trail concepts. The following pages include conceptual network maps along with supporting trail segment tables and descriptions. These materials are meant to support the USFS environmental review process along with trail corridor design/flagging that is part of the second phase of this project.

Trail Accelerator Grants (TAG)

To grow the quantity and quality of mountain bike trail communities, IMBA has identified the need to accelerate the pace of trail building. Trail Accelerator Grants (TAG) provide a jump-start to communities that have the interest and political support to develop trail systems but need assistance to get projects up and running. A TAG award provides professional trail planning and consultation services to launch a community's trail development efforts, which can often leverage additional investment from local, regional, and national partners.

In late 2022, EAST and partner WVU OEDC were awarded TAG matching funds to engage IMBA Trail Solutions to create this plan.



Project Area Overview Map

TRAIL CONCEPTS

03

STUART – ZONES 1-4

The Stuart Zone encompasses the existing Stuart Recreation area, Bickle Knob, Bear Heaven Campground, John's Run, and Little Black Fork. This Zone is broken down into four sub-zones based on access points and unique trail experiences represented in each Zone.

ZONE 1

Zone 1 includes Stuart Recreation Area and Campground, Public Road 91/Stuart Drive to the summit of Bickle Knob. Bickel Knob is the highest point in the project area at 4,006' and provides over 1,800 feet of elevation gain to Johns Run. Stuart Recreation Area is between shavers Fork and Shavers Fork Road which is a popular camping and day use area. The River Loop Trail follows the edge of this area. A small knob rises above the campground and day-use area that offers opportunities for some beginner trails along the gentler terrain. A new trailhead is needed along Shavers Fork Road across from the Group Camping Area to provide access to the planned trail system. This will allow users to start from the bottom of the trail system and provides the best access to beginner terrain. This site is easily accessible, offers flat terrain for trailhead development and is close to the City of Elkins.

Three Grazing Allotment areas are found within this zone along with some wildlife openings creating some pinch points for trail connectivity. This zone includes steep terrain and extremely rocky areas that limit trail opportunities.

The concept for this zone looks to provide a series of loop opportunities for a range of ability levels. Beginner trails are located close to the trailhead along both sides of Shavers Fork Road. A series of intermediate loops climb from there weaving around the Grazing Allotments and creating shorter loop opportunities and connections with Public Road 91/Stuart Drive and up to Bickle Knob. Bickle Knob provides a sought after destination for trail users and offers options for intermediate and advanced users. Major trail hubs are located at key connection points with some creating links to neighboring zones.

ZONE 2

Zone 2 links Public Road 91/Stuart Drive to Bear Heaven Campground south of the Otter Creek Wilderness Area. Public Road 91 creates a barrier between Zone 2 and the Otter Creek Wilderness. Wildlife openings are avoided to the extent possible with one crossing needed to create a connection between Bickle Knob and Bear Heaven Campground. This connecting trail maintains a mellow grade just below the road. The beginner trail along the edge of the campground will provide an easy loop for campground users. Two intermediate loops take advantage of the unique terrain and large boulders winding through this area and providing a high country experience among the spruce/fir plateau.

ZONE 3

Zone 3 encompasses Johns Run, Johns Run upper tributaries to Rattlesnake Run. There is an existing Access Point with a gate from Johns Run Road. Bickle Knob to Johns Run Road

provides the longest continuous descent of around 1,800 feet creating destination worthy trail opportunities. Johns Run with its surrounding ridges provide engaging terrain with filtered views from rock outcrops and sheltered valleys for exploration. Multiple longer loop opportunities are available with connections to Stuart Trailhead, Bickle Knob, and Little Black Fork Trailhead. Shavers Fork Road can also be utilized to link to this limited access zone.

ZONE 4

Zone 4 is north of Rattlesnake Run and includes Little Black Fork and the existing Parking Area. This parking area should be formalized as a trailhead. Regular use here will help displace less desirable uses of the site. Little Black Fork is surrounded by steep hillsides and rock outcrops and a forded crossing will be needed to access some of the gentler terrain. This site is ideal for more rugged technical trails while offering views of cascades and pools along Little Black Fork. To create connectivity to the other zones a ford will also be necessary across Rattlesnake Run.

Stuart Stats

Acres:

Zone 1 - 1,442 acres

Zone 2 - 702 acres

Zone 3 - 1,838 acres

Zone 4 - 2,475 acres

Points of Interest:

- Stuart Recreation Area
- Group Campsites
- Bickle Knob Observation Tower
- Shavers Fork
- Johns Run
- Rattlesnake Run
- Little Black Run

Existing Trails:

- River Loop Trail – 1.35 miles

Constraints:

- Grazing allotments
- Wildlife openings
- Otter Creek Wilderness and connecting trails
- Fernow Experimental Forest
- USFS roads
- Steep terrain
- Private parcels

Trail Concept Summaries:

Trail concepts are represented in the following maps and tables. There are five trail types represented in this zone with opportunities for beginner to advanced trail users. Some trails could to be managed as directional routes, but the majority are shared-use singletrack. Some segments may incorporate technical trail features and bike optimized elements but the

general character is to complement the natural environment while providing desired recreational experiences. Details on trail types can be found in the following Trail Specification Table.

Zones 1-4 Access & Amenities:

Zone 1

New Trailhead Parking Lot - Shavers Fork Road, across from the overflow camping area. This will be the main access point for trail users in the Stuart area.

- Space for 20 - 30 vehicles
  - Standard parking spaces 9' x 18'
  - 2 Handicap spaces with 8' aisle
- Trailhead kiosk and wayfinding signage
- Restroom/pit toilet
- Bike fix-it station

Bickle Knob Parking Area - trail access point. This existing lot has limited parking, but it can also serve as a shuttle drop-off point for those looking for access to the top of the trail system. The Bickle Knob viewing platform is accessed from this parking area.

- Existing lot provides space for 8-10 vehicles
- Install Trailhead kiosk and wayfinding signage

Zone 2

Bear Heaven Day Use Area - Existing parking area alongside the Bear Heaven Campground. Zone 2 Trails would be accessed from this site with Segment 200 linking to Bickle Knob and Stuart trails.

- Existing parking area
- Install Trailhead kiosk and wayfinding signage

Zone 3

John's Run Road - Trail access point. This site has limited access along an easement to the USFS gate at the property boundary. The current space is limited to 2-3 vehicles without blocking the road. Access will be limited to bike/pedestrian users only. Trail users should be encouraged to park at the Stuart trailhead and use Shavers Fork Road to return to the trailhead.

- Access point only

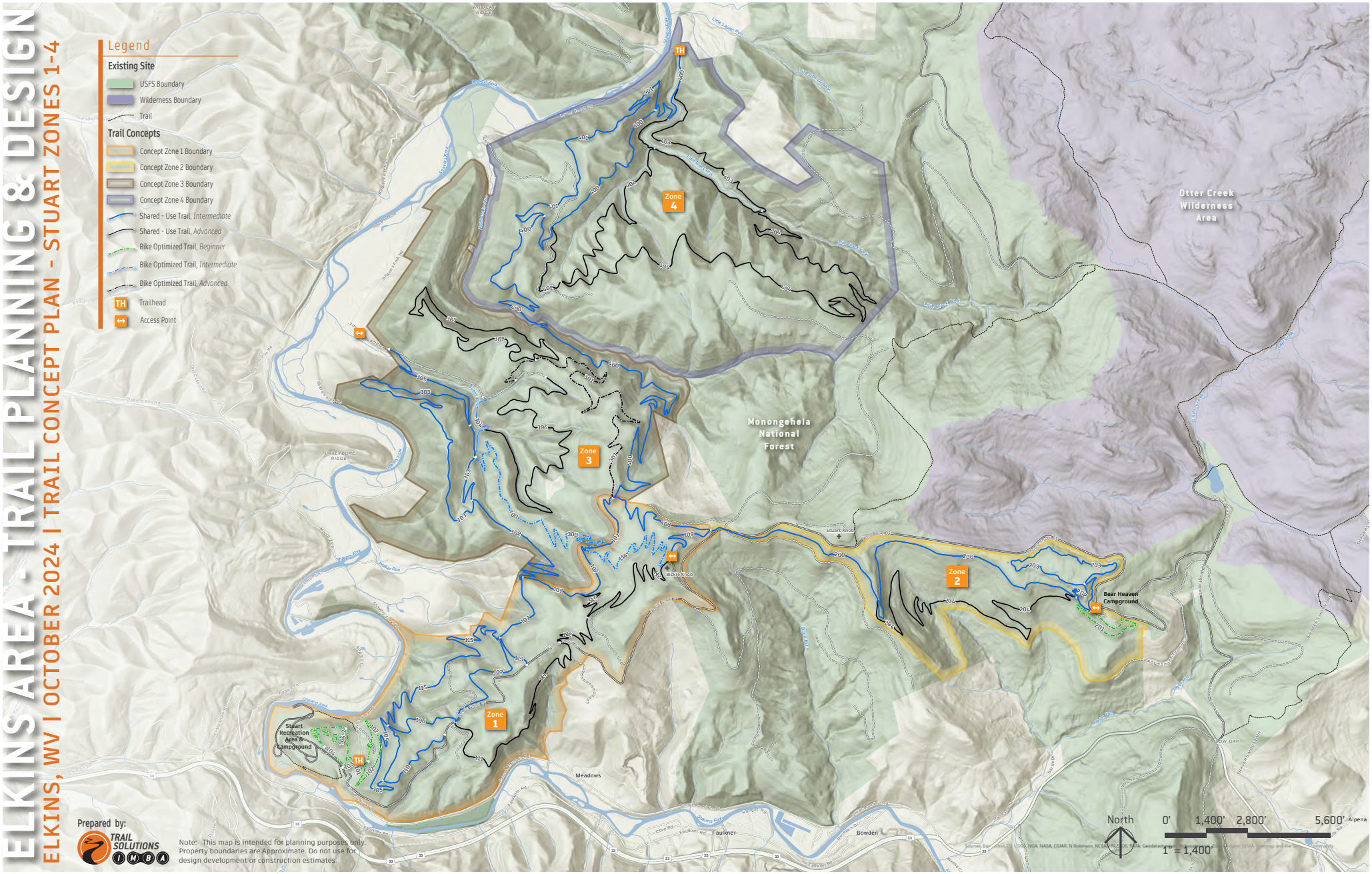
Zone 4

Little Black Fork - Trailhead. The existing parking area should be formalized as a trailhead as Zone 4 trails are built out. This site would create a second trailhead in the Stuart Zone and allow for easy access to the trail system from the north.

- Provide space for 10 - 15 vehicles
- Trailhead kiosk and wayfinding signage
- Restroom/pit toilet

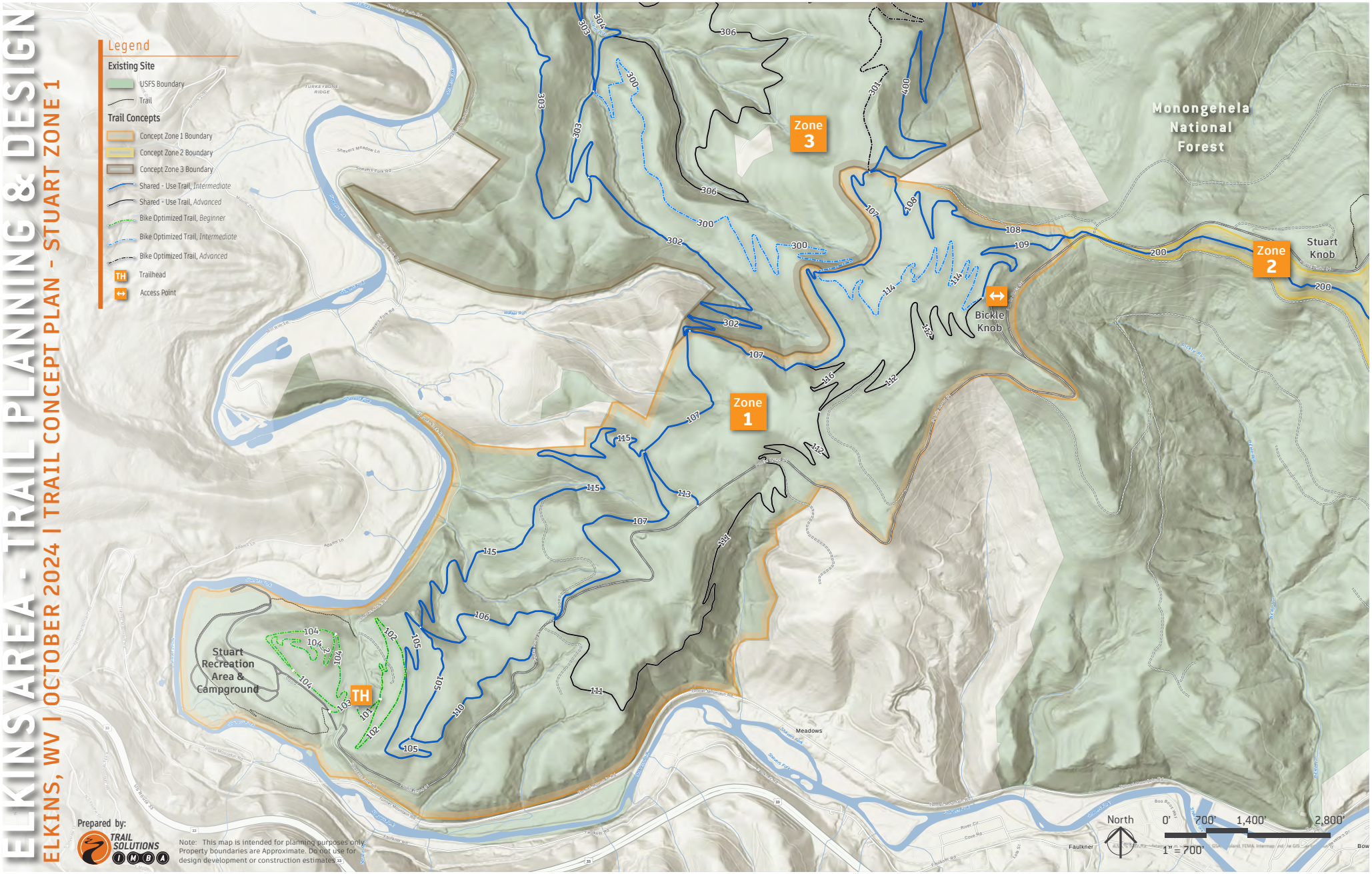
ELKINS AREA - TRAIL PLANNING & DESIGN

ELKINS, WV | OCTOBER 2024 | TRAIL CONCEPT PLAN - STUART ZONES 1-4



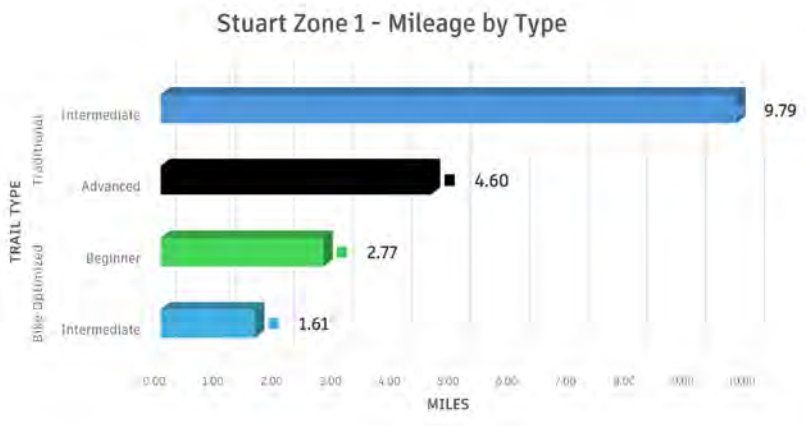
ELKINS AREA - TRAIL PLANNING & DESIGN

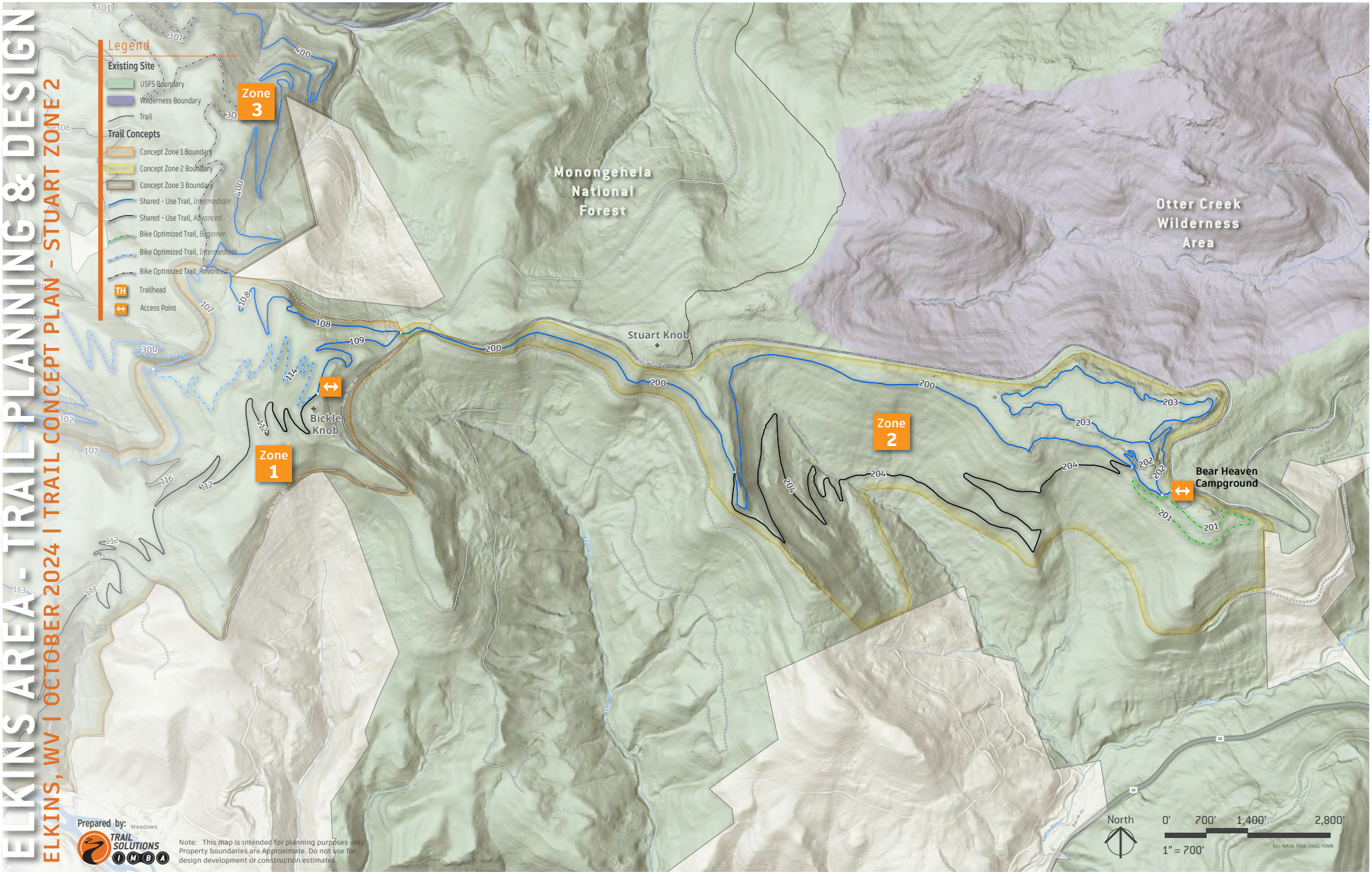
ELKINS, WV | OCTOBER 2024 | TRAIL CONCEPT PLAN - STUART ZONE 1



Elkins Area Trail Planning & Design - Trail Concept Table Zone 1

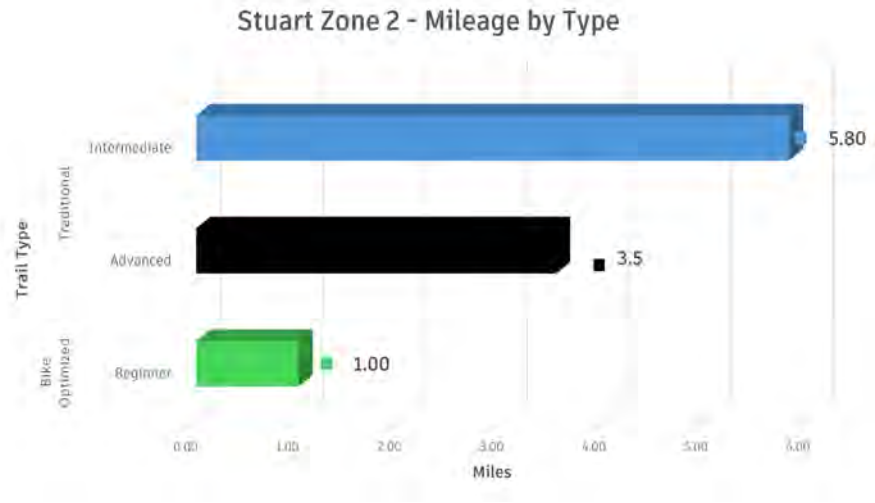
Name	Zone	Zone Number	Style	Skill	USFS Trail Class	User	Direction	Phase	Length Miles
101	Stuart	1	Bike Optimized	Beginner	3	Shared-use	Bidirectional	1	0.13
102	Stuart	1	Bike Optimized	Beginner	3	Shared-use	Bidirectional	1	1.02
103	Stuart	1	Bike Optimized	Beginner	3	Shared-use	Bidirectional	1	0.07
104	Stuart	1	Bike Optimized	Beginner	3	Shared-use	Bidirectional	1	0.87
104_2	Stuart	1	Bike Optimized	Beginner	3	Shared-use	Bidirectional	1	0.67
105	Stuart	1	Traditional	Intermediate	3	Shared-use	Bidirectional	1	1.42
106	Stuart	1	Traditional	Intermediate	3	Shared-use	Bidirectional	1	0.60
107	Stuart	1	Traditional	Intermediate	3	Shared-use	Bidirectional	1	3.04
108	Stuart	1	Traditional	Intermediate	3	Shared-use	Bidirectional	1	1.07
109	Stuart	1	Traditional	Intermediate	3	Shared-use	Bidirectional	1	0.65
110	Stuart	1	Traditional	Intermediate	3	Shared-use	Bidirectional	2	0.60
111	Stuart	1	Traditional	Advanced	3	Shared-use	Bidirectional	1	1.92
112	Stuart	1	Traditional	Advanced	3	Shared-use	Bidirectional	2	2.18
113	Stuart	1	Traditional	Intermediate	3	Shared-use	Bidirectional	1	0.26
114	Stuart	1	Bike Optimized	Intermediate	3	Bike-only	Downhill	1	1.61
115	Stuart	1	Traditional	Intermediate	3	Shared-use	Bidirectional	2	2.14
116	Stuart	1	Traditional	Advanced	3	Shared-use	Bidirectional	2	0.49
Total									18.77




ELKINS AREA - TRAIL PLANNING & DESIGN
ELKINS, WV | OCTOBER 2024 | TRAIL CONCEPT PLAN - STUART ZONE 2
Legend
Existing Site
USFS Boundary
Wilderness Boundary
Trail
Trail Concepts
Concept Zone 1 Boundary
Concept Zone 2 Boundary
Concept Zone 3 Boundary
Shared - Use Trail, Intermediate
Shared - Use Trail, Advanced
Bike Optimized Trail, Beginner
Bike Optimized Trail, Intermediate
Bike Optimized Trail, Advanced
Trailhead
Access Point
Zone 3
Zone 2
Zone 1
Monongehela National Forest
Otter Creek Wilderness Area
Stuart Knob
Bickle Knob
Bear Heaven Campground
Prepared by:
Note: This map is intended for planning purposes only. Property boundaries are Approximate. Do not use for design development or construction estimates.
North
0' 700' 1,400' 2,800'
1" = 700'

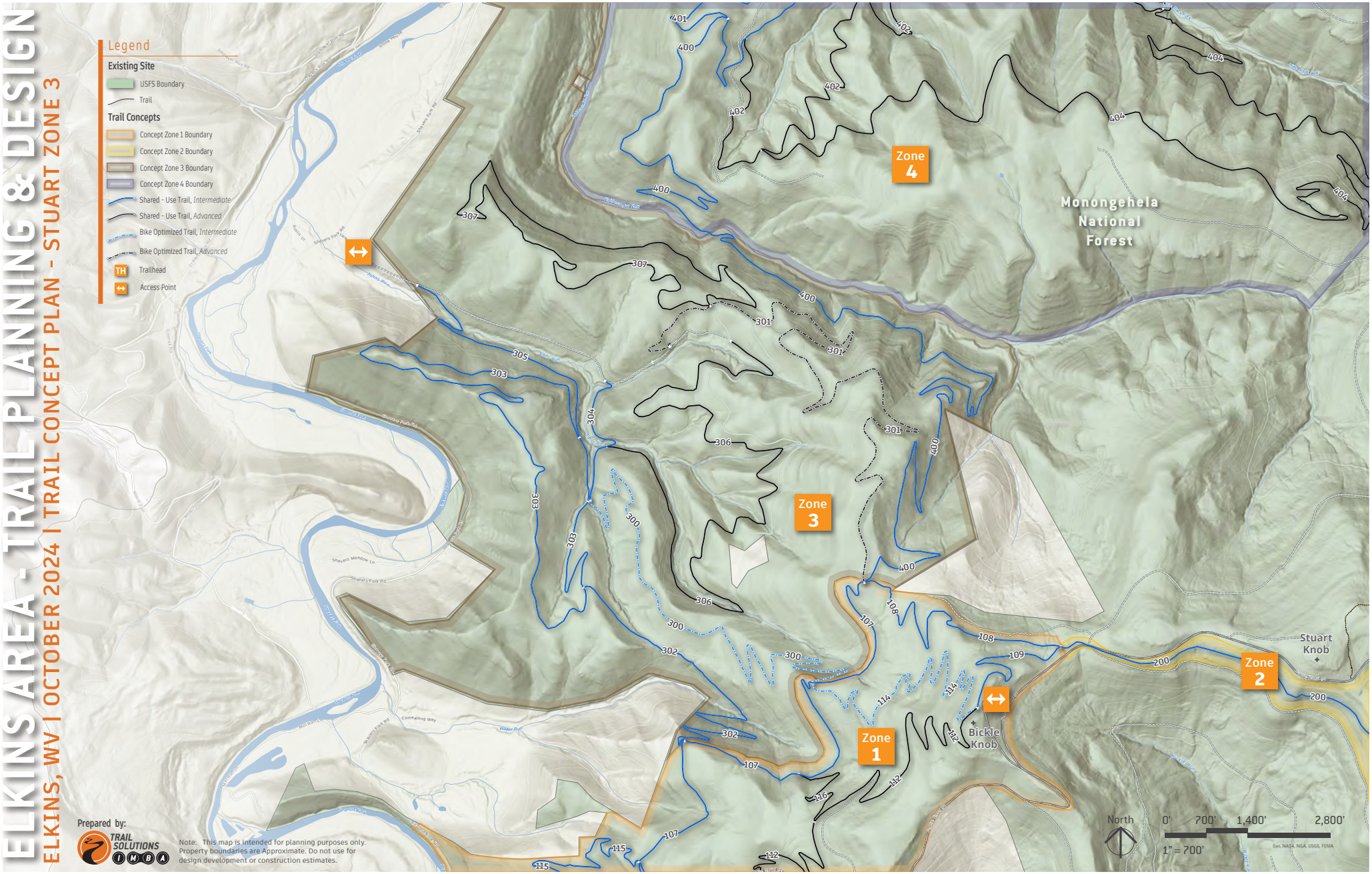
Elkins Area Trail Planning & Design - Trail Concept Table Zone 2

Name	Zone	Zone Number	Style	Skill	USFS Trail Class	User	Direction	Phase	Length Miles
200	Stuart	2	Traditional	Intermediate	3	Shared-use	Bidirectional	3	3.51
201	Stuart	2	Bike Optimized	Beginner	3	Shared-use	Bidirectional	3	1.00
202	Stuart	2	Traditional	Intermediate	3	Shared-use	Bidirectional	3	0.64
203	Stuart	2	Traditional	Intermediate	3	Shared-use	Bidirectional	3	1.66
204	Stuart	2	Traditional	Advanced	3	Shared-use	Bidirectional	6	3.52
Total									10.33



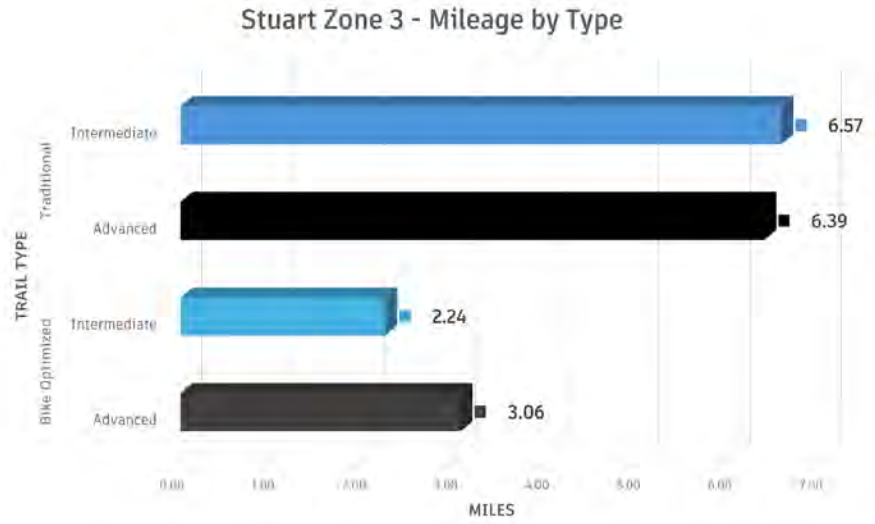
ELKINS AREA - TRAIL PLANNING & DESIGN

ELKINS, WV | OCTOBER 2024 | TRAIL CONCEPT PLAN - STUART ZONE 3



Elkins Area Trail Planning & Design - Trail Concept Table Zone 3

Name	Zone	Zone Number	Style	Skill	USFS Trail Class	User	Direction	Phase	Length Miles
300	Stuart	3	Bike Optimized	Intermediate	3	Bike-only	Downhill	2	2.24
301	Stuart	3	Bike Optimized	Advanced	3	Bike-only	Downhill	2	3.06
302	Stuart	3	Traditional	Intermediate	3	Shared-use	Bidirectional	2	1.58
303	Stuart	3	Traditional	Intermediate	3	Shared-use	Bidirectional	2	3.50
304	Stuart	3	Traditional	Intermediate	3	Shared-use	Bidirectional	2	0.52
305	Stuart	3	Traditional	Intermediate	3	Shared-use	Bidirectional	3	0.97
306	Stuart	3	Traditional	Advanced	3	Shared-use	Bidirectional	3	3.21
307	Stuart	3	Traditional	Advanced	3	Shared-use	Bidirectional	3	3.18
Total									18.26

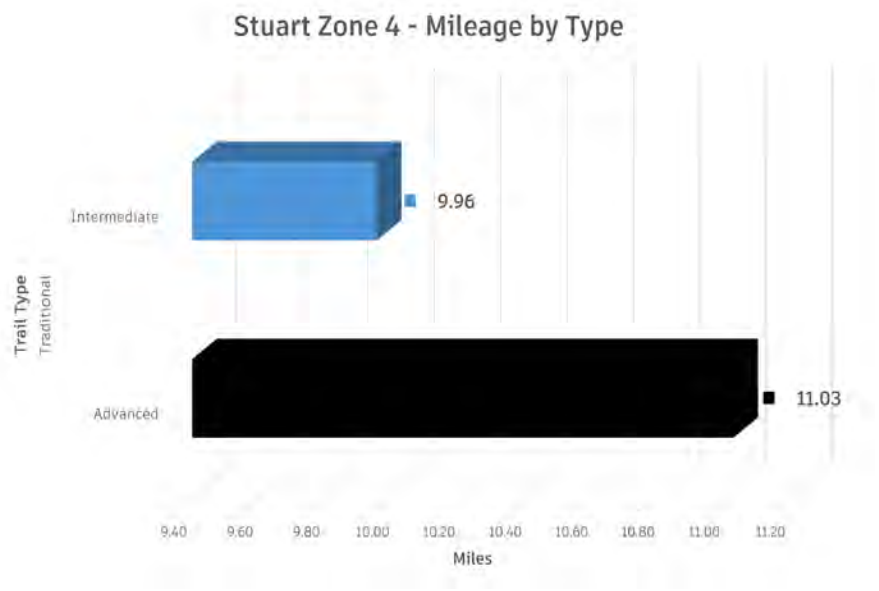


ELKINS AREA - TRAIL PLANNING & DESIGN

ELKINS, WV | OCTOBER 2024 | TRAIL CONCEPT PLAN - STUART ZONE 4

Elkins Area Trail Planning & Design - Trail Concept Table zone 4

Name	Zone	Zone Number	Style	Skill	USFS Trail Class	User	Direction	Phase	Length Miles
400	Stuart	4	Traditional	Intermediate	3	Shared-use	Bidirectional	3	7.57
401	Stuart	4	Traditional	Intermediate	3	Shared-use	Bidirectional	5	2.38
402	Stuart	4	Traditional	Advanced	3	Shared-use	Bidirectional	5	2.97
403	Stuart	4	Traditional	Advanced	3	Shared-use	Bidirectional	5	2.38
404	Stuart	4	Traditional	Advanced	3	Shared-use	Bidirectional	5	5.68
Total									20.99



POLECAT – ZONE 5

Polecat lies between Route 219 and South Haddix Run. Corridor H bisects this zone with two new trailheads being developed along the corridor. The South Haddix Trail will connect these new trailheads along the ridgeline. A private parcel interrupts connectivity along the ridgeline making for a less than ideal trail alignment. An easement should be pursued to allow trail access to limit unnecessary descending and ascending trail segments. A series of short relatively moderate loops are envisioned close to the trailhead give area users easily accessible options perfect for families and casual trail users. Corridor H creates a crossing barrier within this zone, but there are multiple loop options available by crossing under the bridges for a unique view of the valleys. Connectivity to the Shingletree Zone is also possible with a trail that links to the Allegheny Highlands Rail Trail from the South Haddix Trail ridgetop.

Polecat Stats

Acres:

Zone 5 - 1,682 acres

Points of Interest:

- South Haddix Trailhead - North
- South Haddix Trailhead - South
- South Haddix Run
- Allegheny Highlands Rail Trail

Existing Trails:

- South Haddix Trail

Constraints:

- Corridor H
- Private parcels

Trail Concept Summaries:

Trail concepts are represented in the following maps and tables. There are three trail types represented in this zone with opportunities for intermediate to advanced trail users. Some trails could be managed as directional routes, but the majority are shared-use singletrack. Some segments may incorporate technical trail features and bike-optimized elements but the general character is to complement the natural environment while providing desired recreational experiences.

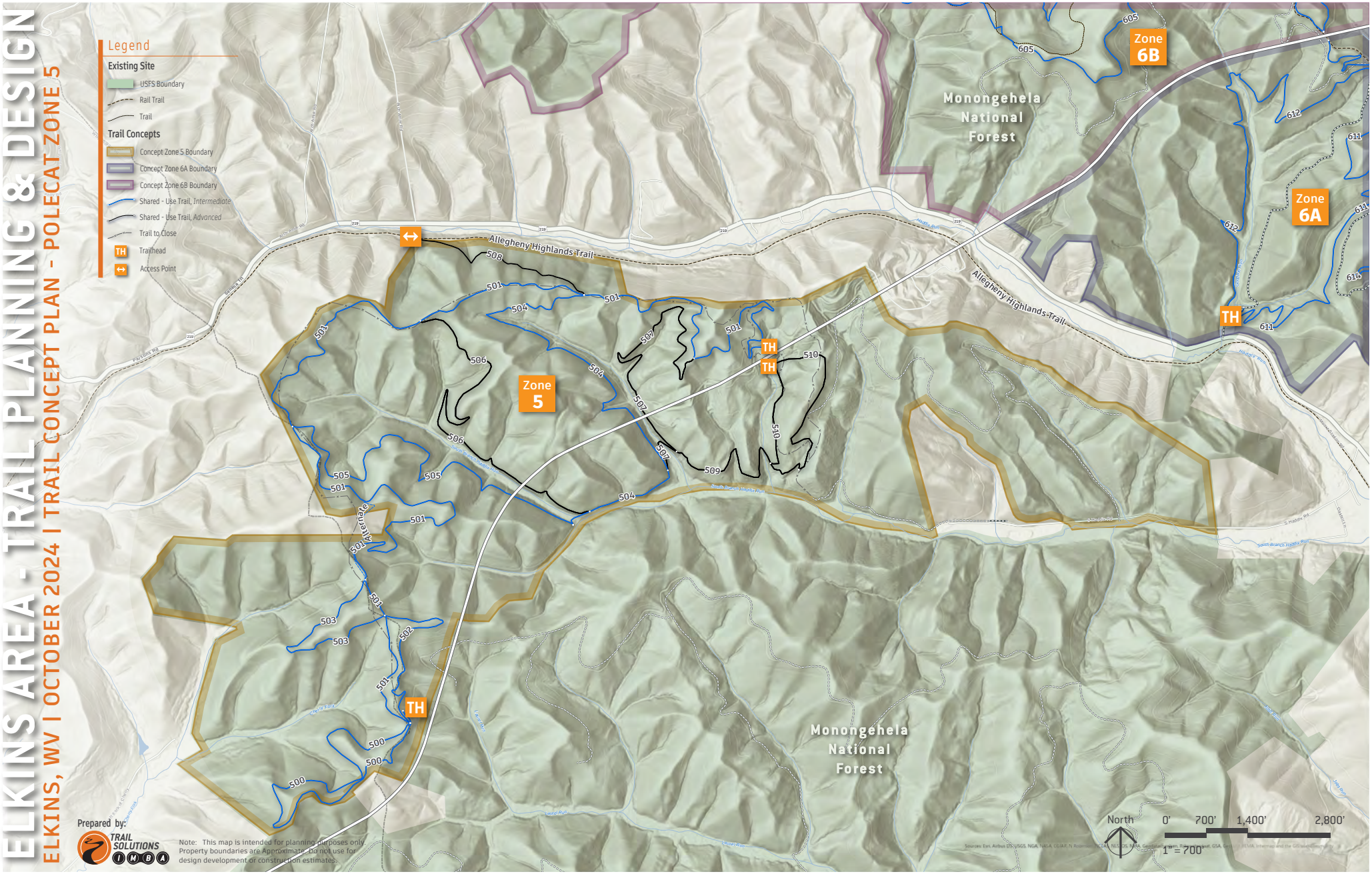
Zone 5 Access & Amenities:

South Haddix Trailhead - South Lot. This will be the main access point for the Polecat Zone along Corridor H. This parking lot was installed during the construction of Corridor H. Additional amenities should be added to make this a welcoming waypoint.

- Existing parking lot
- Trailhead kiosk and wayfinding signage
- Restroom/pit toilet
- Bike fix-it station
- Pavilion/picnic area

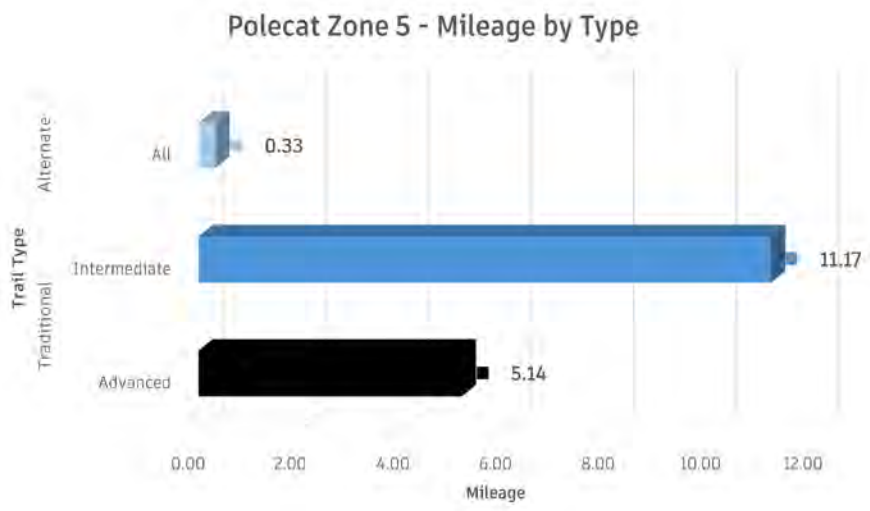
South Haddix Trailhead - North Lot. This parking area will be completed as construction finishes in this area. It will be located on the north side of the highway and will provide a secondary access point to the South Haddix Trail. An additional lot would be needed for direct access to segment 510 on the south side of the highway. This could be a small lot or pull off for 4-6 vehicles.

- New parking lot
- Trailhead kiosk and wayfinding signage


ELKINS AREA - TRAIL PLANNING & DESIGN
ELKINS, WV | OCTOBER 2024 | TRAIL CONCEPT PLAN - POLECAT ZONE 5
Legend
Existing Site
USFS Boundary
Rail Trail
Trail
Trail Concepts
Concept Zone 5 Boundary
Concept Zone 6A Boundary
Concept Zone 6B Boundary
Shared - Use Trail, Intermediate
Shared - Use Trail, Advanced
Trail to Close
TH Trailhead
Access Point
Zone 5
Zone 6A
Zone 6B
Monongehela National Forest
Allegheny Highlands Trail
TH
Prepared by:
TRAIL SOLUTIONS IMBA
Note: This map is intended for planning purposes only. Property boundaries are Approximate. Do not use for design development or construction estimates.
North
0' 700' 1,400' 2,800'
1" = 700'

Elkins Area Trail Planning & Design - Trail Concept Table Zone 5

Name	Zone	Zone Number	Style	Skill	USFS Trail Class	User	Direction	Phase	Length Miles
500	Polecat	5	Traditional	Intermediate	3	Shared-use	Bidirectional	3	1.73
501	Polecat	5	Traditional	Intermediate	3	Shared-use	Bidirectional	3	4.87
501 Alternate	Polecat	5	Alternate	All	3	Shared-use	Bidirectional	3	0.33
502	Polecat	5	Traditional	Intermediate	3	Shared-use	Bidirectional	3	0.71
503	Polecat	5	Traditional	Intermediate	3	Shared-use	Bidirectional	3	0.73
504	Polecat	5	Traditional	Intermediate	3	Shared-use	Bidirectional	4	1.68
505	Polecat	5	Traditional	Intermediate	3	Shared-use	Bidirectional	4	1.44
506	Polecat	5	Traditional	Advanced	3	Shared-use	Bidirectional	4	1.48
507	Polecat	5	Traditional	Advanced	3	Shared-use	Bidirectional	4	1.17
508	Polecat	5	Traditional	Advanced	3	Shared-use	Bidirectional	4	0.62
509	Polecat	5	Traditional	Advanced	3	Shared-use	Bidirectional	4	0.86
510	Polecat	5	Traditional	Advanced	3	Shared-use	Bidirectional	4	1.02
Total									16.63



SHINGLETREE - ZONE 6A & 6B

Shingletree, Zone 6 is located just west of Parsons. It lies between Route 219 and Clover Run Road with Corridor H bisecting the zone. A new trailhead will be established along Corridor H with a pedestrian bridge connecting the two sides. FS Road 993 provides access off Route 219. Multiple loops are created for intermediate and advanced trail users on the south side of Corridor H. These trails explore the terrain along Goodwin Run and Sugartree Run and connect with the existing Shingletree Trail.

A short loop trail north of the new Corridor H Trailhead creates easy access to the viewpoint at the top of the ridge. From here connections to Clover Run Road establish a variety of trail experiences for trail users of all ability levels.

Multiple access points exist along Clover Run Road, but a formalized trailhead should be developed at the Clover Trail Trailhead. This site allows for further development of beginner trails along gentler terrain with loop and progression opportunities available. Trails within this zone create longer loop options and provide connectivity with existing trails along with offer opportunities for new engaging trail experiences.

Shingletree Stats

Acres:

Zone 6 – 3,406 acres

Points of Interest:

- New Trailhead along Corridor H
- Viewpoint over Corridor H
- Goodwin Run
- Sugarcamp Run
- Shingletree Run
- Clover Run
- Campsites Clover Run Road
- Allegheny Highlands Rail Trail
- FS Road 933

Existing Trails:

- Shingletree Trail – 4.14
- Pheasant Mountain Trail – 4.18
- Clover Trail 1.79

Constraints:

- Wildlife openings
- Corridor H crossings
- Highway 219
- USFS roads
- Steep terrain
- Private parcels

Trail Concept Summaries:

Trail concepts are represented in the following maps and tables. There are five trail types represented in this zone with opportunities for beginner to advanced trail users. Some trails could be managed as directional routes but the majority are shared-use singletrack. Some segments may incorporate technical trail features and bike optimized elements but the general character is to complement the natural environment while providing desired recreational experiences.

Zone 6A & 6B Access & Amenities:

Zone 6A

Corridor H - Trailhead and Pedestrian Bridge. This will be the main access point for the Shingletree Zone along Corridor H. Plans are underway to construct this trailhead and bridge as work is completed along corridor H.

- Parking lot
- Trailhead kiosk and wayfinding signage
- Restroom/pit toilet
- Bike fix-it station
- Pavilion/picnic area

Forest Road 933 - Small Trailhead. A small trailhead at the bottom of Forest Road 933 will allow access to Zone 6A.

- Parking for 4-6 vehicles
- Trailhead kiosk and wayfinding signage

Clover Run Road - Trailhead & Access Points. There is an existing informal parking area at the base of the Clover Run Trail along Clover Run Road. This site should be formalized as a trailhead as Zone 6B trails are developed. This would provide easy access to beginner trails and allow users to start at the bottom of the trail system. Additional access points can be found along Clover Run Road, but these sites have limited potential for parking.

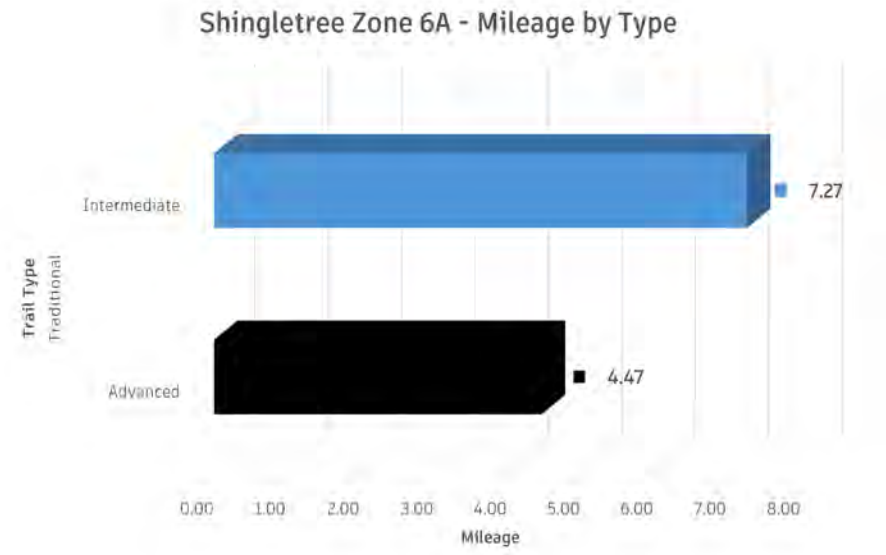
- Formalized Parking Area with space for 15 - 20 vehicles
- Trailhead kiosk and wayfinding signage
- Restroom/pit toilet

ELKINS AREA - TRAIL PLANNING & DESIGN

ELKINS, WV | OCTOBER 2024 | TRAIL CONCEPT PLAN - SHINGLETREE ZONE 6

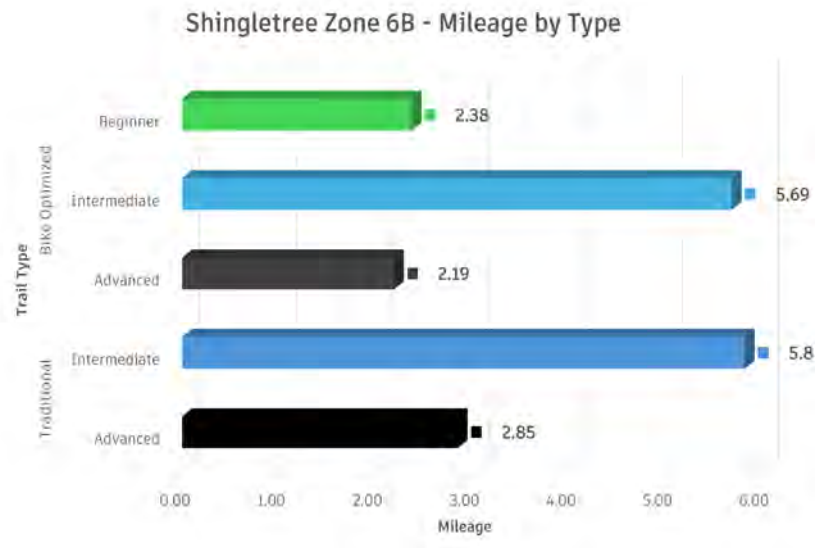
Elkins Area Trail Planning & Design - Trail Concept Table Zone 6A

Name	Zone	Zone Number	Style	Skill	USFS Trail Class	User	Direction	Phase	Length Miles
611	Shingletree	6a	Traditional	Intermediate	3	Shared-use	Bidirectional	5	2.55
612	Shingletree	6a	Traditional	Intermediate	3	Shared-use	Bidirectional	5	1.88
613	Shingletree	6a	Traditional	Intermediate	3	Shared-use	Bidirectional	5	1.63
614	Shingletree	6a	Traditional	Intermediate	3	Shared-use	Bidirectional	5	1.20
615	Shingletree	6a	Traditional	Advanced	3	Shared-use	Bidirectional	6	2.14
616	Shingletree	6a	Traditional	Advanced	3	Shared-use	Bidirectional	5	2.33
Total									11.73



Elkins Area Trail Planning & Design - Trail Concept Table Zone 6B

Name	Zone	Zone Number	Style	Skill	USFS Trail Class	User	Direction	Phase	Length Miles
600	Shingletree	6b	Traditional	Intermediate	3	Shared-use	Bidirectional	5	1.34
601	Shingletree	6b	Bike Optimized	Intermediate	3	Bike-only	Bidirectional	6	2.77
602	Shingletree	6b	Bike Optimized	Advanced	3	Bike-only	Downhill	6	2.19
603	Shingletree	6b	Traditional	Intermediate	3	Shared-use	Bidirectional	6	0.50
604	Shingletree	6b	Traditional	Intermediate	3	Shared-use	Bidirectional	6	1.85
605	Shingletree	6b	Traditional	Intermediate	3	Shared-use	Bidirectional	6	2.15
606	Shingletree	6b	Bike Optimized	Intermediate	3	Shared-use	Bidirectional	6	1.35
607	Shingletree	6b	Bike Optimized	Intermediate	3	Shared-use	Bidirectional	6	1.57
608	Shingletree	6b	Bike Optimized	Beginner	3	Shared-use	Bidirectional	6	1.60
609	Shingletree	6b	Bike Optimized	Beginner	3	Shared-use	Bidirectional	6	0.77
610	Shingletree	6b	Traditional	Advanced	3	Shared-use	Bidirectional	6	2.85
Total									18.94



PHASE 1 TRAIL DESIGN

04

DESIGN METHODOLOGY

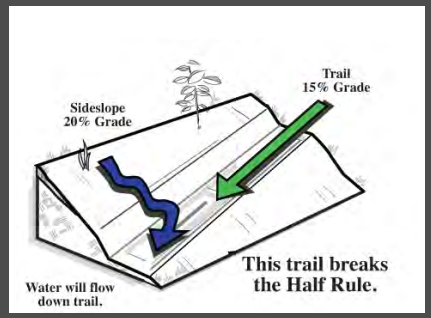
Trail design includes flagging trail corridors, capturing detailed notes, outlining trail specifications, taking accurate measurements, and recording GPS tracks for project review and construction teams.

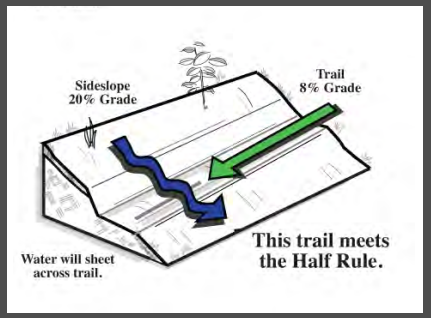
The following section explains details of the design process completed by IMBA Trail Solutions in the Monongahela National Forest of Phase 1 Trails for Stuart Zone 1 in October 2024.

5 ESSENTIAL TRAIL ELEMENTS

The Half Rule

A trail's grade should not exceed half the grade of the hillside or side slope that the trail traverses. If the trail does exceed half the side slope, it is considered a "fall-line trail." Water will flow down a fall-line trail rather than run across it, and therefore cause significant rutting and erosion. There are exceptions to this rule, but those types of trails require significant expertise to execute and should be left in the hands of qualified professionals.

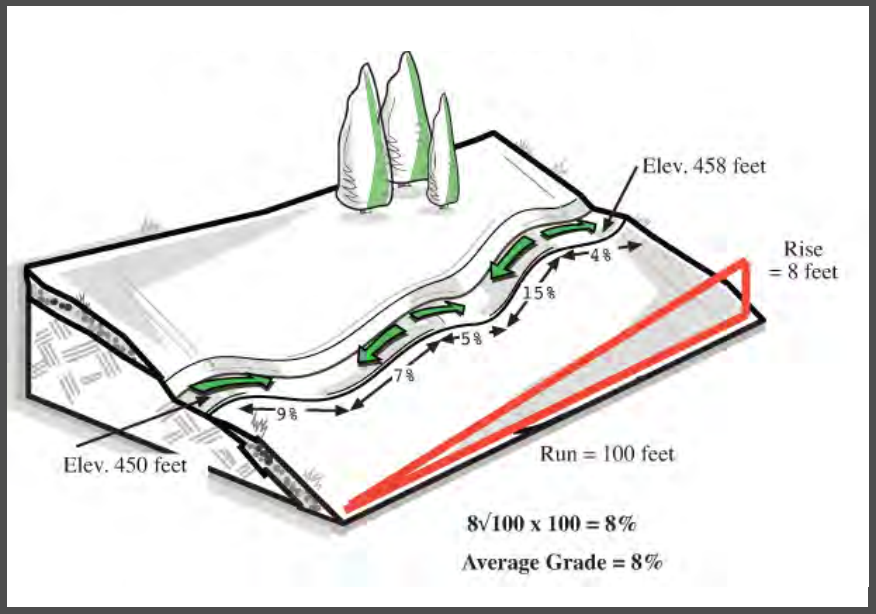




The Ten Percent Average Grade Guideline

Historically, the thought has been that an average grade of 10% or less minimizes erosion. This guideline has evolved and while a 10% average or less may be acceptable for an expert-level trail, the industry practices have become more specific to trail difficulty level: Beginner trails range

from 0-5% average grade, intermediate trails range from 5-7% average grade, and advanced trails average 7-9% (or higher) grade. Trail segment grades are directly related to the amount of exertion required when climbing, as well as the speeds that can be reached when descending. This is extremely important for planning rider experiences, as an average 7% or higher grade on a climbing trail can be excruciating for a newer, less fit rider and potentially turn them off completely from riding again. The same can be true for having a descent that is too steep for a less-skilled rider, also potentially scaring them away from mountain biking.

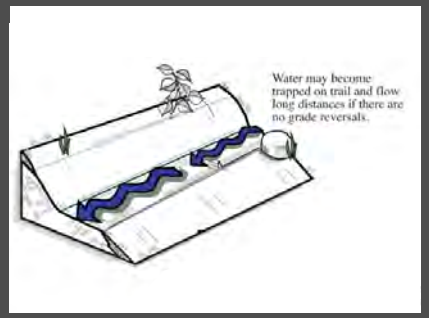


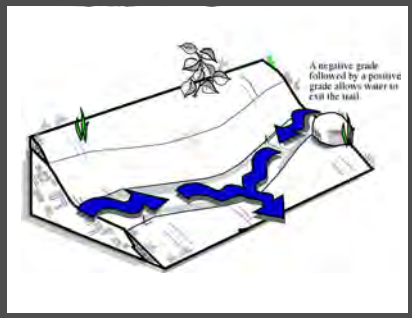
Maximum Sustainable Trail Grades

Maximum grade is the steepest section of trail that is more than 10 feet in length. This grade is soil composition dependent, but 15-20% maximum grade is considered typical. These grades can be exceeded if trail tread reinforcement techniques such as rock armoring are used.

Grade Reversals

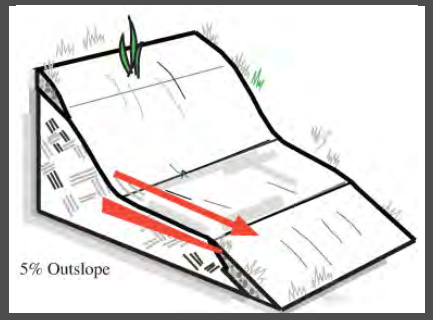
Grade reversals occur when a trail that is going down (negative grade) transitions into a trail that is going up (positive grade). This results in a low spot on the trail, which is commonly referred to as a drain, because this is where water exits from the trail. Frequent grade reversals every 40 to 100 feet are critical for a healthy trail system to ensure water can flow from the trail as frequently as possible. Grade reversals are also a critical element of the overall user experience.



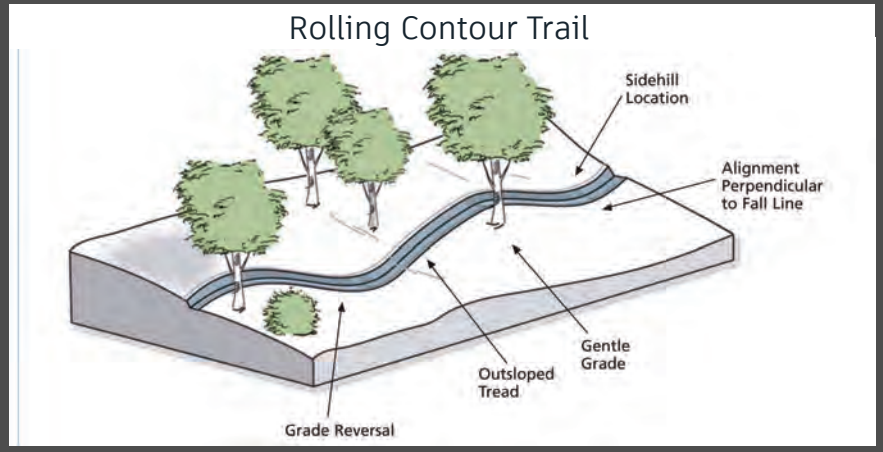


Outslope

As the trail contours across a hillside, the downhill or outer edge of the tread should slope slightly down and away from the inner/high side at about a 5% slope. This tilt is called “outslope,” and it encourages water to sheet across and off the trail. Modern mountain bike trail building techniques focus heavily on insloped trails to maximize fun, but still rely on outslope at drains and any part of the trail where an inslope is not required to keep the rider on the trail.



Rolling Contour Trail



General Guidelines

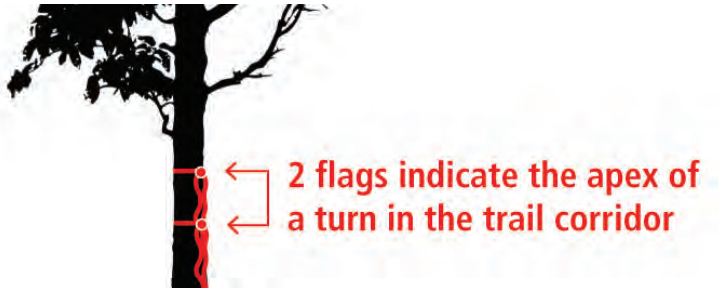
The designed trails in this zone are bidirectional, shared-use singletrack and bike-optimized downhill only singletrack. Some segments may incorporate technical trail features, but overall, the trails aim to accentuate the natural environment of the Monongahela National Forest. All trails follow IMBA Trail Solutions principles for sustainable trails with rolling contour alignments.

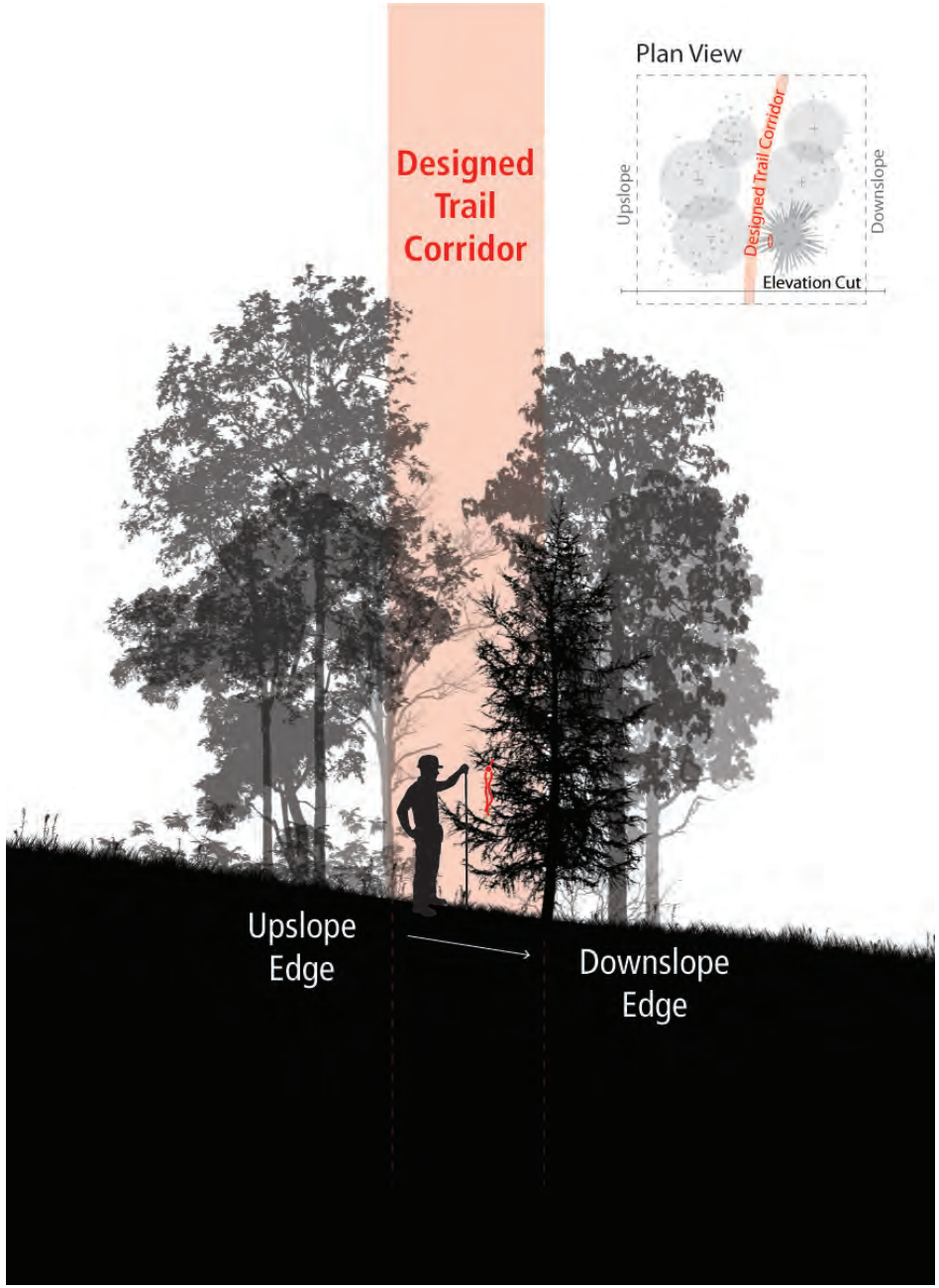
During this design process, particular care was taken to adhere to the prescribed trail grades for each trail difficulty level, and to avoid to the extent possible forest or existing infrastructure, forest management areas, property boundaries, and sensitive resources. Drainage crossings were selected to minimize the crossing zones to the extent possible. Mitigation measures such as stone armoring will be needed. These areas were identified in the field with blue and white flagging or blue and white striped flagging. Potential wet areas are identified in the design details dataset and on the maps that correspond to north northeast and northwestern facing slopes, or the wetness index mapping layer shared by the USFS. Additional armoring may be needed in these areas. Where feasible trail alignments were co-located on non-system roads within these potential wet areas. These locations should follow road to trail conversion techniques.

Trail Flagging

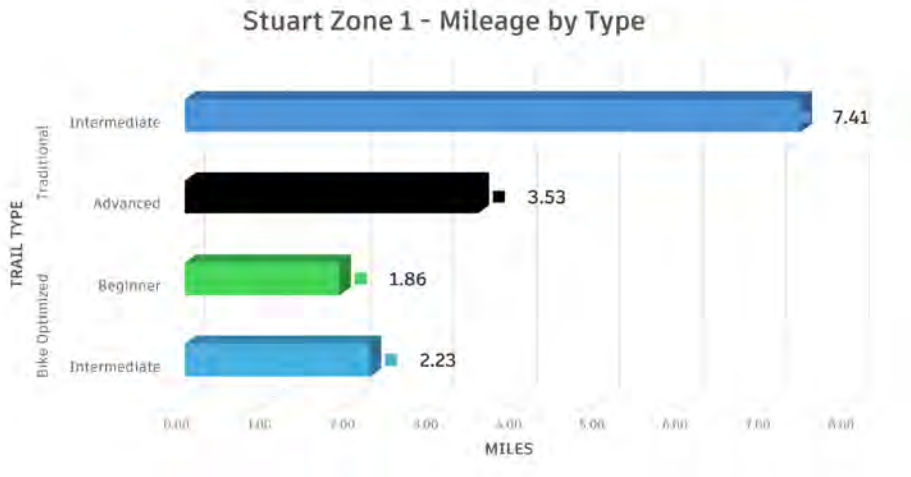
The trail flagging process includes tying colored outdoor flagging tape to trees that represent the downhill edge of the trail corridor. A 50’ trail corridor should be used for resource specialist review to allow for field fitting during construction. Typically, the knot in the tape faces uphill and is tied at eye level.

This positioning enables designers, reviewers, and construction teams to utilize these markings as references for measuring trail grade with an inclinometer. The spacing between flags varies by tree canopy and underbrush type. Flags may be tied every ten feet or less in brushy areas or spaced 100 feet or more in an open canopy. The following graphics show general flagging practices. Field marking includes intersection marking on corrugated plastic signs. These small signs are intended to provide a detailed intersection layout in the field.





IMBA Trail Solutions staff flagged just over 15 miles of trail at prescribed, sustainable grades. This includes 1.86 miles of beginner bike-optimized trail, 7.4 miles of intermediate traditional shared-use trail, 2.2 miles of intermediate bike-optimized trail, and 3.5 mile of advanced trail.



Turn and Hub Locations

Turn locations are marked in the field with two stacked flags. In addition to providing a more dynamic and enjoyable trail experience, turns are often designed to avoid property constraints and maintain sustainable trail grades. When possible, turns are situated on gentler side slopes to allow for more efficient construction and better management of water and soil erosion.

Hub locations are marked in the field with three stacked flags, designating key intersections of two or more trails in the network. These are meant to be wide, graded areas with wayfinding signage to orient trail users. Hubs also serve as rest spots, so they should be wide enough to fit a few trail users at a given time.

Constructed Tread Width

Constructed tread widths follow the trail difficulty rating guidelines developed by IMBA Trail Solutions. Wider constructed treads are prescribed to beginner trails with trails narrowing as the difficulty level increases. Tread widths are expected to narrow over time as the trail settles into the landscape.

Maximum and Average Grade

The flagged trails' maximum and average grades were calculated to ensure that each trail follows the grades prescribed by the

IMBA Trail Solutions trail difficulty rating system. These grades were determined by uploading the trail alignment data to the IMBA Trail Solutions Elevation Profile Tool, which calculates the maximum grade of a trail over a 100-foot interval and the weighted average grade of the trails' ascending and descending segments.

Tread Armoring

Tread armoring is prescribed in areas where wet soils, drainage crossings, or otherwise more erodible surfaces are unavoidable. Tread armoring and materials may differ between project areas according to the specific location requirements, the project budget, and materials (e.g., loose rocks) available in the surrounding landscape.

Although flowing water observed in only a few of the drainages or swales in Stuart Zone 1, areas where water may flow during intense precipitation events were identified for potential rock armoring. These areas may be easily armored with rock found on-site. Wet areas identified based on aspect or wetness index mapping will likely need additional armoring. Armoring in these areas should be identified and mitigated during construction.

Rock armoring is installed such that water easily sheets over the surface without catching sediment or debris. Rock armoring techniques are discussed in great detail in resources found on IMBA's website as well as various IMBA publications.

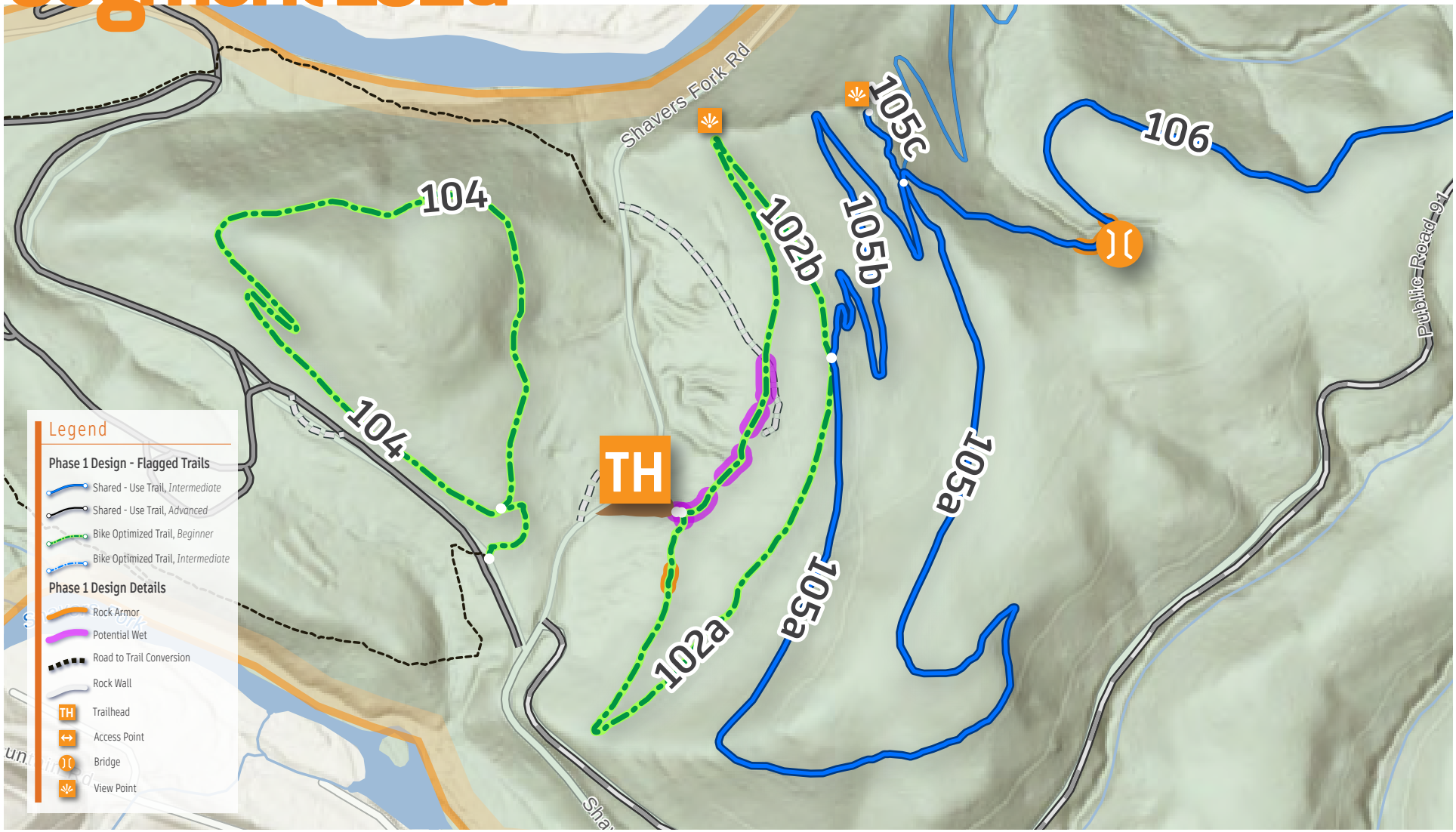
Best Management Practices Trail on Steep Slopes

Slope refers to the hillside or terrain a trail is crossing, whereas grade is used to describe the running length of the trail. Both are measured in percent. The following guidelines cover best practices for trails crossing slopes greater than 50% to prevent soil displacement and erosion.

- Trails will follow a contour alignment and include self-sustaining grade reversals as seen in the 5 Essential Trail Elements.
- Trail running grade will not exceed 50% of the side slope when the side slope is under 50% (The Half Rule)
- A trail running grade will not exceed 30% of the side slope when side slope exceeds 50%.
- Grade reversals or water diversions should be installed at no less than 100' intervals.
- On slopes over 50% or areas with noted seeps, or without tree canopy coverage, grade reversals should occur at more frequent intervals of 40' -75'.
- Grade reversal style should match the intended use and difficulty level of the trail. Rolling grade dips are preferred on beginner and intermediate shared use trails. While water bars may be acceptable on expert level shared-use or hiking only trails.
- Average trail grade, measured over 300', should not exceed 15%. This does not account for grade limits created by difficulty ratings.
- Any tread that exceeds 25% grade for longer than 3' should be stabilized with flagstone, rock pitching, or a constructed feature.
- Rock walls may be necessary to stabilize excavated and fill slopes greater than 2 to 1 that are intended to remain unvegetated or when successful lasting stabilization with vegetation is not feasible. Knee walls on the bottom of steeper backslopes can be used to reduce the grade on the upper portion of the backslope to allow it to be stabilized with organic materials such as leaf litter or duff.
- Drains that release concentrated flow should be armored with rock or sufficiently stabilized with rip-rap to prevent head cutting. Typically over a 2 to 1 slope. Armor and rip-rap should both prevent erosion and disperse concentrated flow before exiting the rock reinforced area.
- Trail sections that have enough subsurface saturation to destabilize the trail tread should be reinforced with rock armor, boardwalk or puncheon. Rock armor is recommended as the best long term solution. In locations with intermittent or seasonal seeps that flow under or across the trail the rock armor installation should allow for subsurface flow. Rock armor should extend beyond the wet area to prevent further widening of the tread.
- Disturbed soil should be mulched and stabilized as soon as possible, preferably before any rain events. Organic materials (leafs & duff) removed during the construction process are the best source of mulch.
- Excess soil should not be placed in drainages of any type or below the exits of constructed drains.
- Drains from constructed grade reversals on slopes over 50% will be rock armored with rip rap or stone pitching to both prevent head cutting and disperse concentrated flow.


ELKINS AREA - TRAIL PLANNING & DESIGN
ELKINS, WV | NOVEMBER 2024 | PHASE 1 TRAIL DESIGN - STUART ZONE 1
Legend
Existing Site
USFS Boundary
Trail
Trail Concepts
Concept Zone 1 Boundary
Concept Zone 2 Boundary
Concept Zone 3 Boundary
Shared - Use Trail, Intermediate
Shared - Use Trail, Advanced
Bike Optimized Trail, Beginner
Bike Optimized Trail, Intermediate
Bike Optimized Trail, Advanced
Phase 1 Design - Flagged Trails
Shared - Use Trail, Intermediate
Shared - Use Trail, Advanced
Bike Optimized Trail, Beginner
Bike Optimized Trail, Intermediate
Phase 1 Design Details
Rock Armor
Potential Wet
Road to Trail Conversion
Rock Wall
Trailhead
Access Point
Bridge
View Point
Zone 3
Zone 1
Zone 2
Monongehela National Forest
Stuart Knob
Bickle Knob
Stuart Recreation Area & Campground
TH
Meadows
Faulkner
North
0'
700'
1,400'
2,800'
1" = 700'
Prepared by:
TRAIL SOLUTIONS IMBA
Note: This map is intended for planning purposes only. Property boundaries are Approximate. Do not use for design development or construction estimates.

Segment 102a

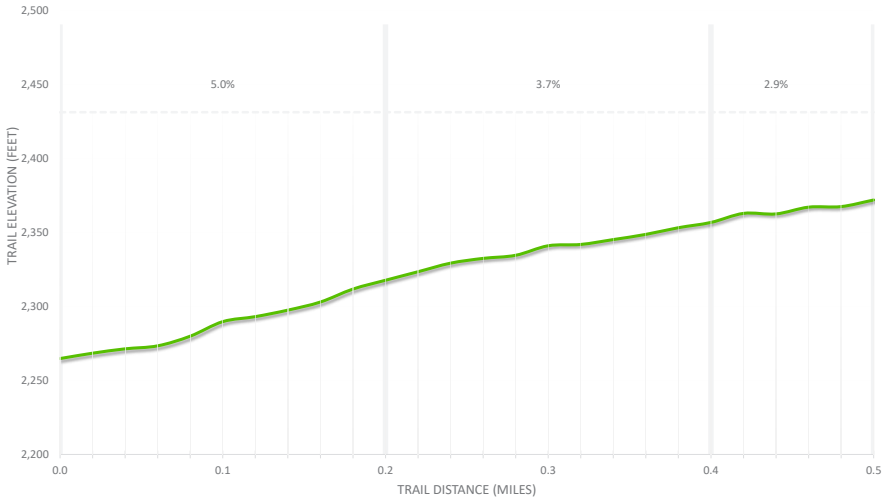


Trail Details:

Flagging Color: Blue
Length: 0.5 miles
Trail Type: Bike-optimized

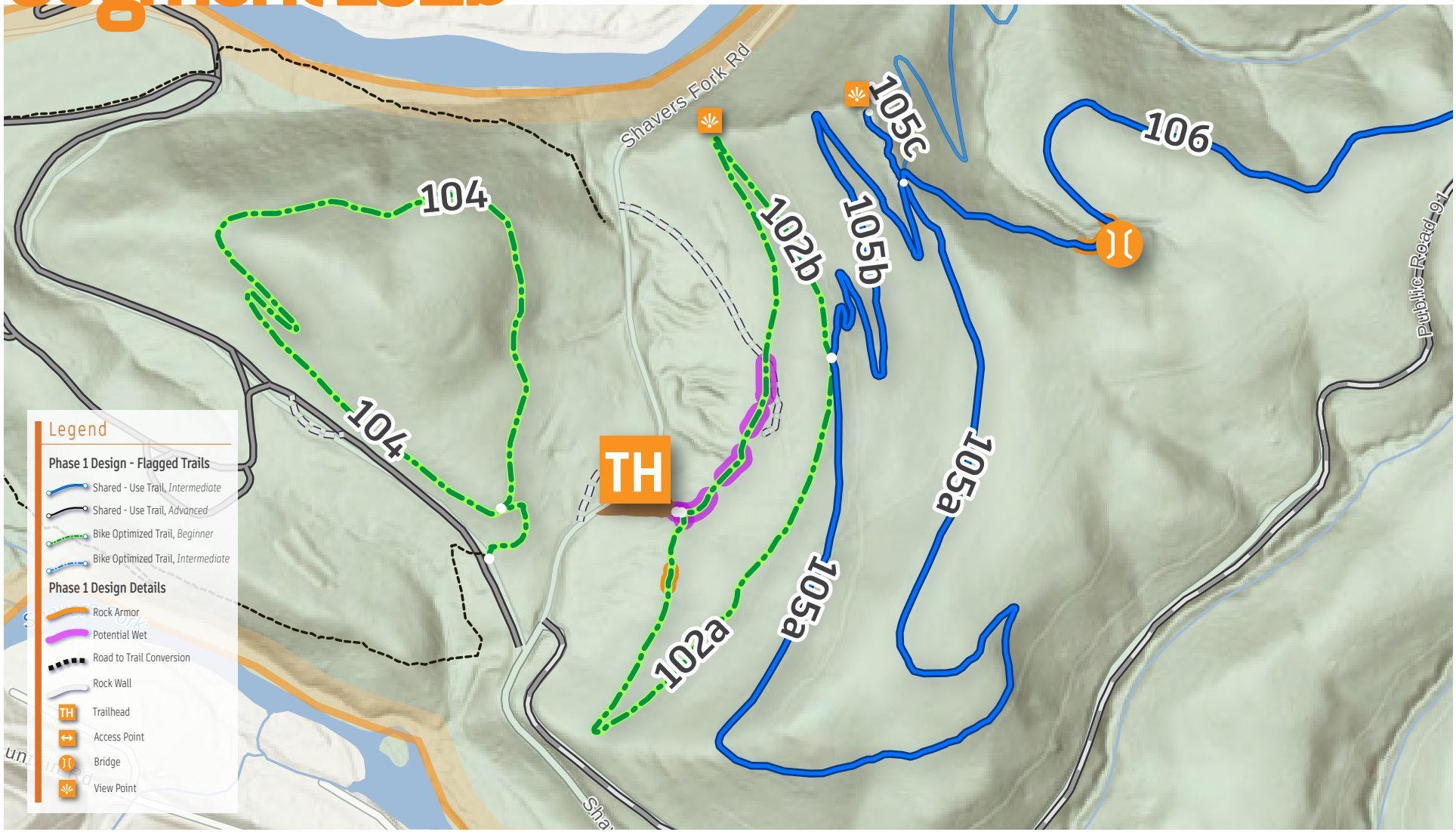
Difficulty: Beginner
Average Climbing Grade: 4.1%
Average Descending Grade: 0.0%

Trail Elevation Profile



Segment 102a is a half mile beginner bike-optimized trail that starts from the new proposed trailhead. This segment climbs the gentle slopes above the trailhead to the hub with 102b and 105a/b. The trail crosses a small drainage a short distance from the trailhead; armoring will be needed here. This easily accessible trail will provide users with a one mile loop when paired with segment 102b directly from the trailhead. All of the beginner trails take advantage of the relatively gentle terrain found lower on the hillside, these trails were laid out to accommodate a wide range of adaptive mountain bikes with wider tread and turns and minimal to no obstacles.

Segment 102b

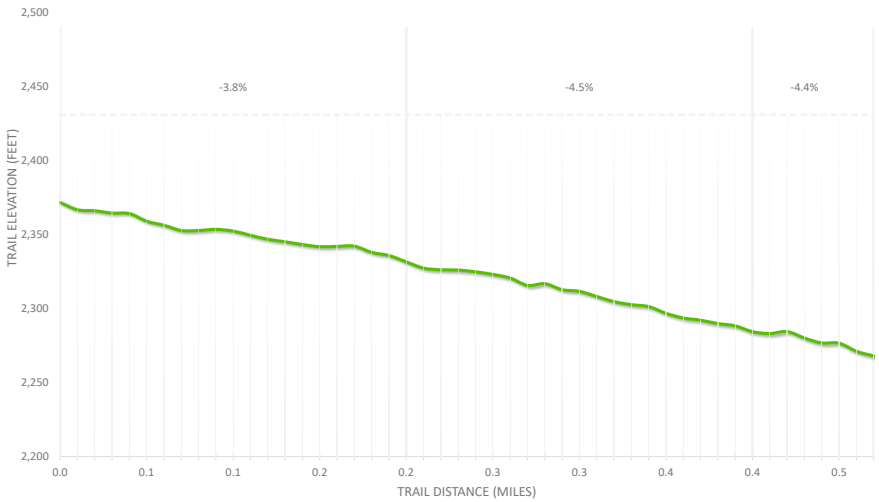


Trail Details:

Flagging Color: Blue
Length: 0.48 miles
Trail Type: Bike-optimized

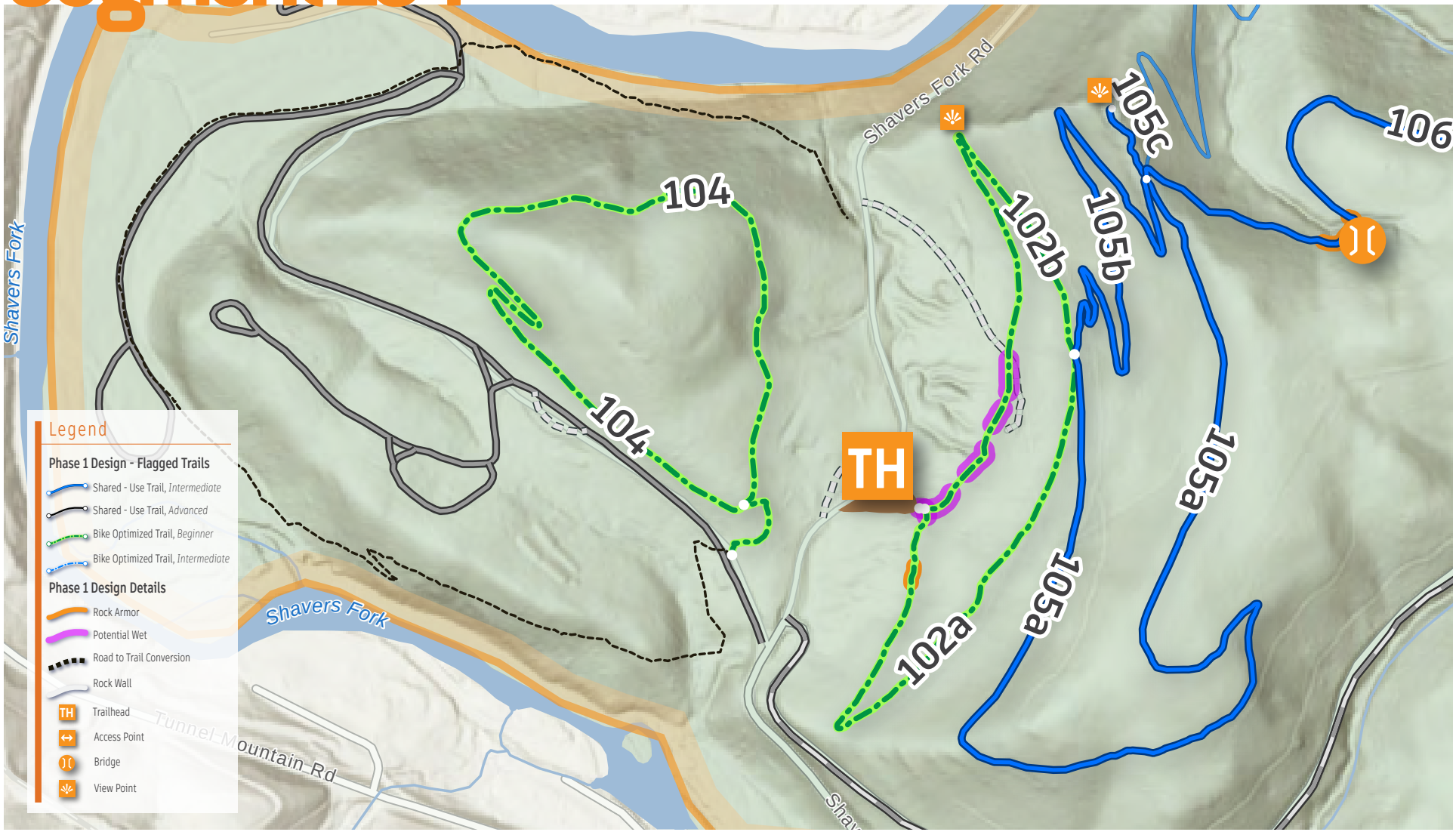
Difficulty: Beginner
Average Climbing Grade: 0.0%
Average Descending Grade: 4.1%

Trail Elevation Profile



Segment 102b descends from the hub with 102a and 105a/b to complete the loop to the trailhead. Where segment 102b makes the turn near the edge of the ridge is a viewpoint of the Shavers Fork valley. This view should be enhanced with the removal of a few key trees. This site offers a short destination point for trail users. Near the trailhead this trail crosses a few areas that are identified on the wetness index dataset. Care was taken to place the trail corridor above the deeper drainage corridors to avoid these spots as much as possible while still maintaining the desired trail experience. Rock armoring may be needed along some of these segments.

Segment 104

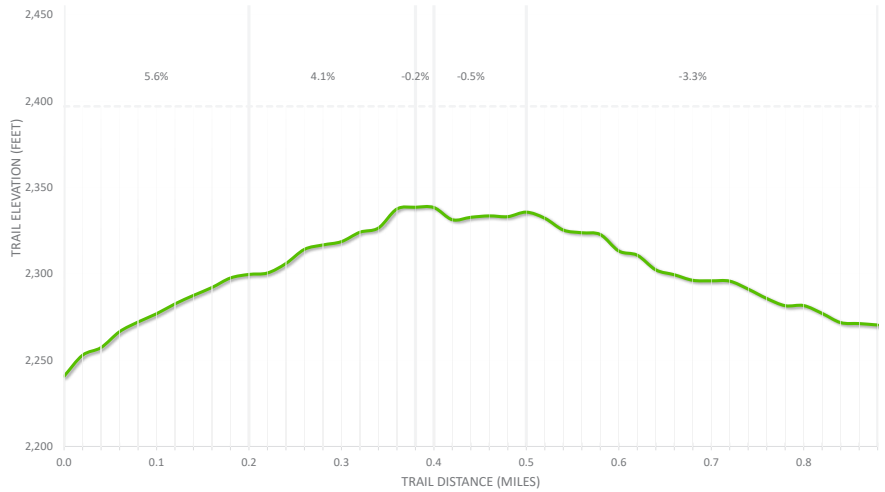


Trail Details:

Flagging Color: Blue
Length: 0.88 miles
Trail Type: Bike-optimized

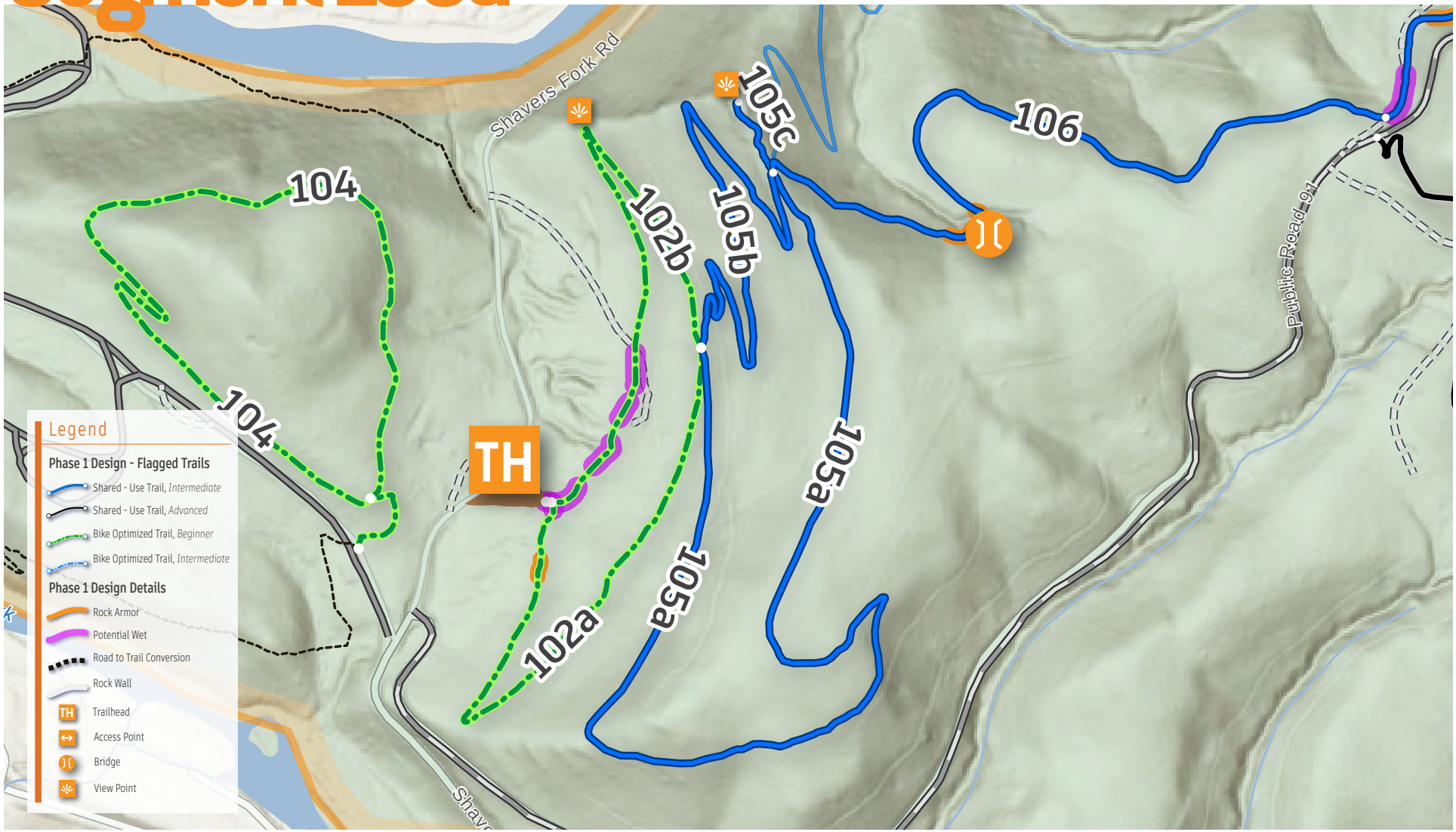
Difficulty: Beginner
Average Climbing Grade: 4.9%
Average Descending Grade: 2.6%

Trail Elevation Profile



Segment 104 circumnavigates the small knoll above Stuart Recreation Area & Campground. This short beginner friendly loop is just under a mile. The trail begins at the existing access point across from a small parking area. It is recommended to relocate the campground access gate to just beyond the parking area to provide access to trail users year round.

Segment 105a

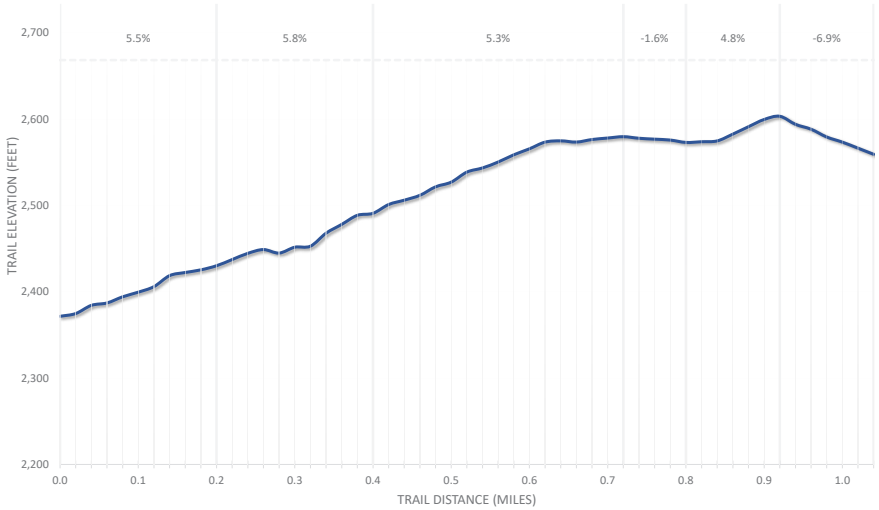


Trail Details:

Flagging Color: Pink
Length: 1.05 miles
Trail Type: Traditional Shared-use

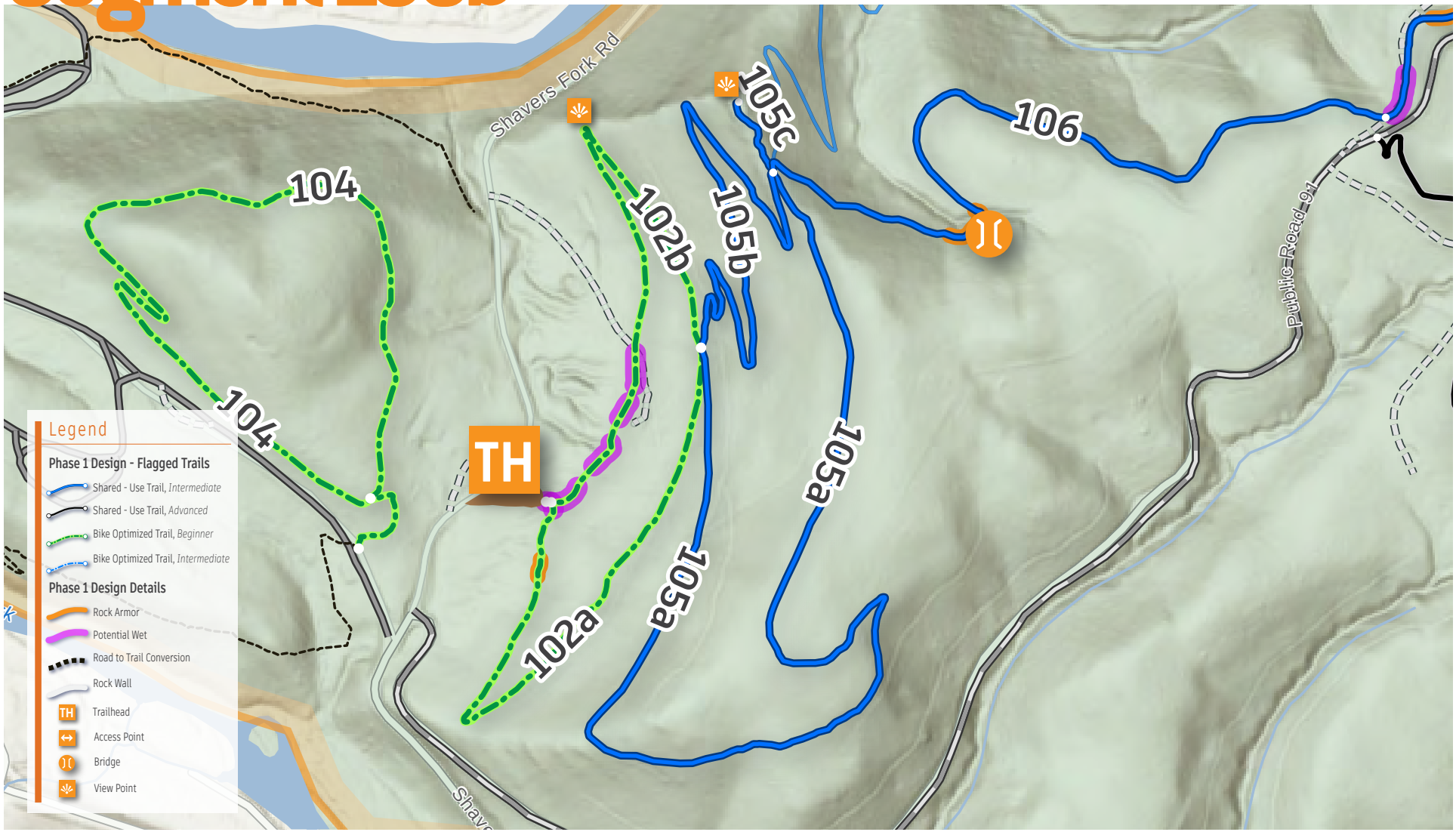
Difficulty: Intermediate
Average Climbing Grade: 5.4%
Average Descending Grade: 4.8%

Trail Elevation Profile



Segment 105a and 105b create an intermediate level stacked loop, building on the beginner loop created by segments 102a/b. From the hub with 102a/b the trail continues to climb where it joins a non-system road for a short distance. It follows the existing grade around the ridge nose where it leaves the non-system road and continues climbing to a highpoint just below the adjacent grazing area. From this highpoint the trail descends to a hub with 105b/c, and 106 in the saddle.

Segment 105b

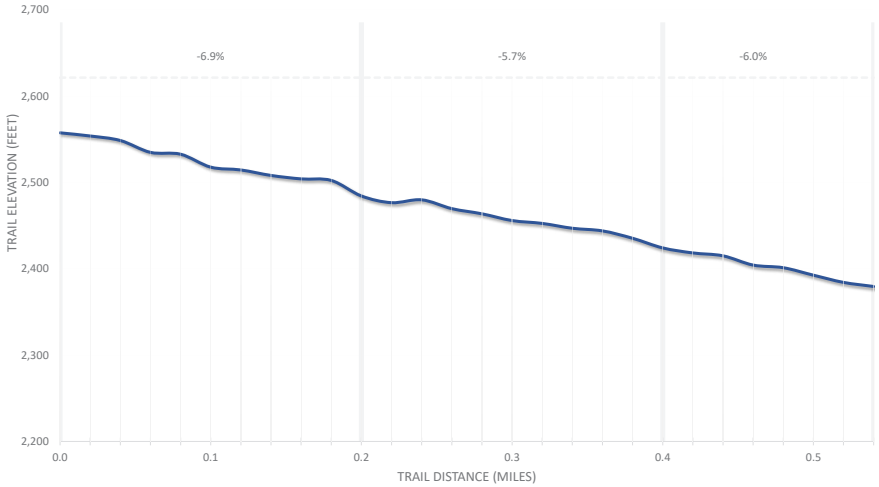


Trail Details:

Flagging Color: Pink
Length: 0.55 miles
Trail Type: Traditional Shared-use

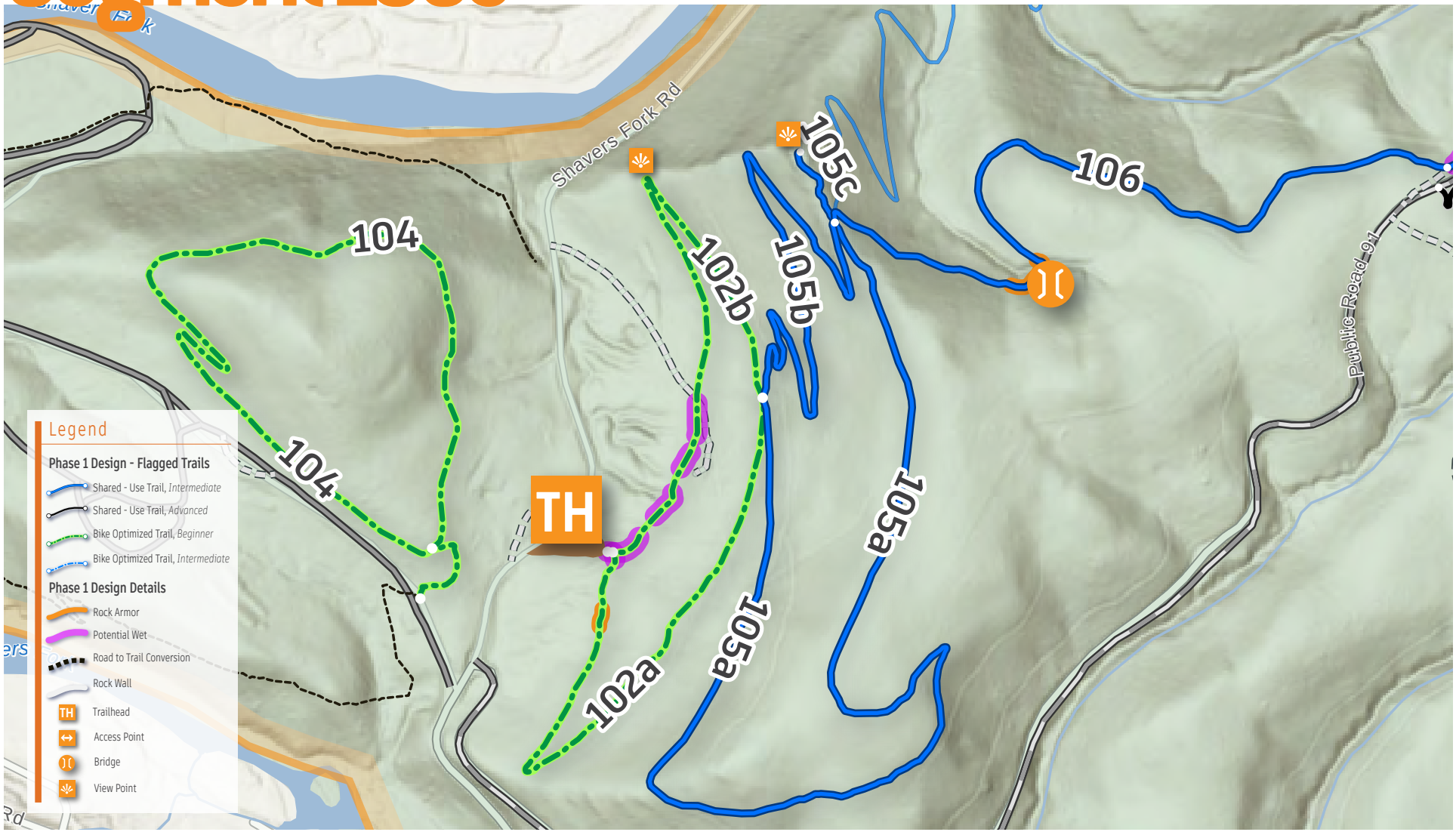
Difficulty: Intermediate
Average Climbing Grade: 0.0%
Average Descending Grade: 6.2%

Trail Elevation Profile



Segment 105b is a short decent from the ridge and includes 6 turns as it navigates some of the steeper slopes and around a series of rock ledges near the crest of the slope. Filtered views can be found as the trail nears the second turn from the top. As the trail nears the hub with 102a/b a series of short turns were laid out to reduce rider speeds as they descend to this junction.

Segment 105c

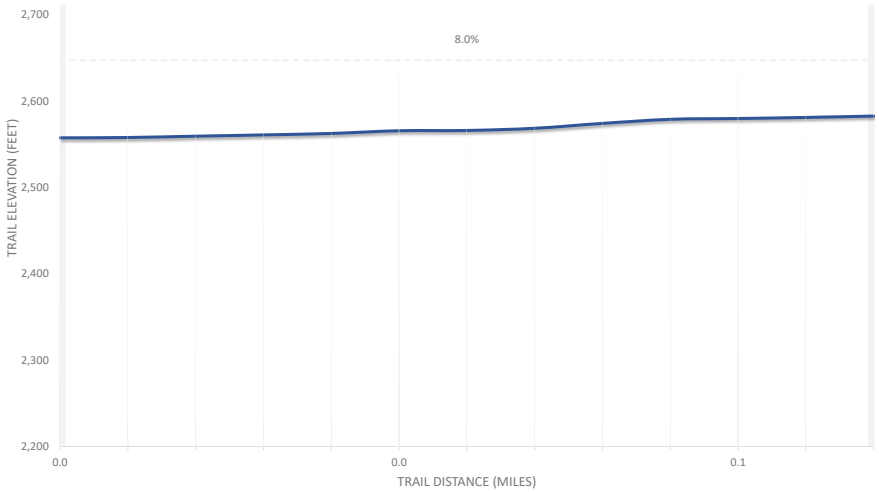


Trail Details:

Flagging Color: Blue
Length: 0.06 miles
Trail Type: Traditional Shared-use

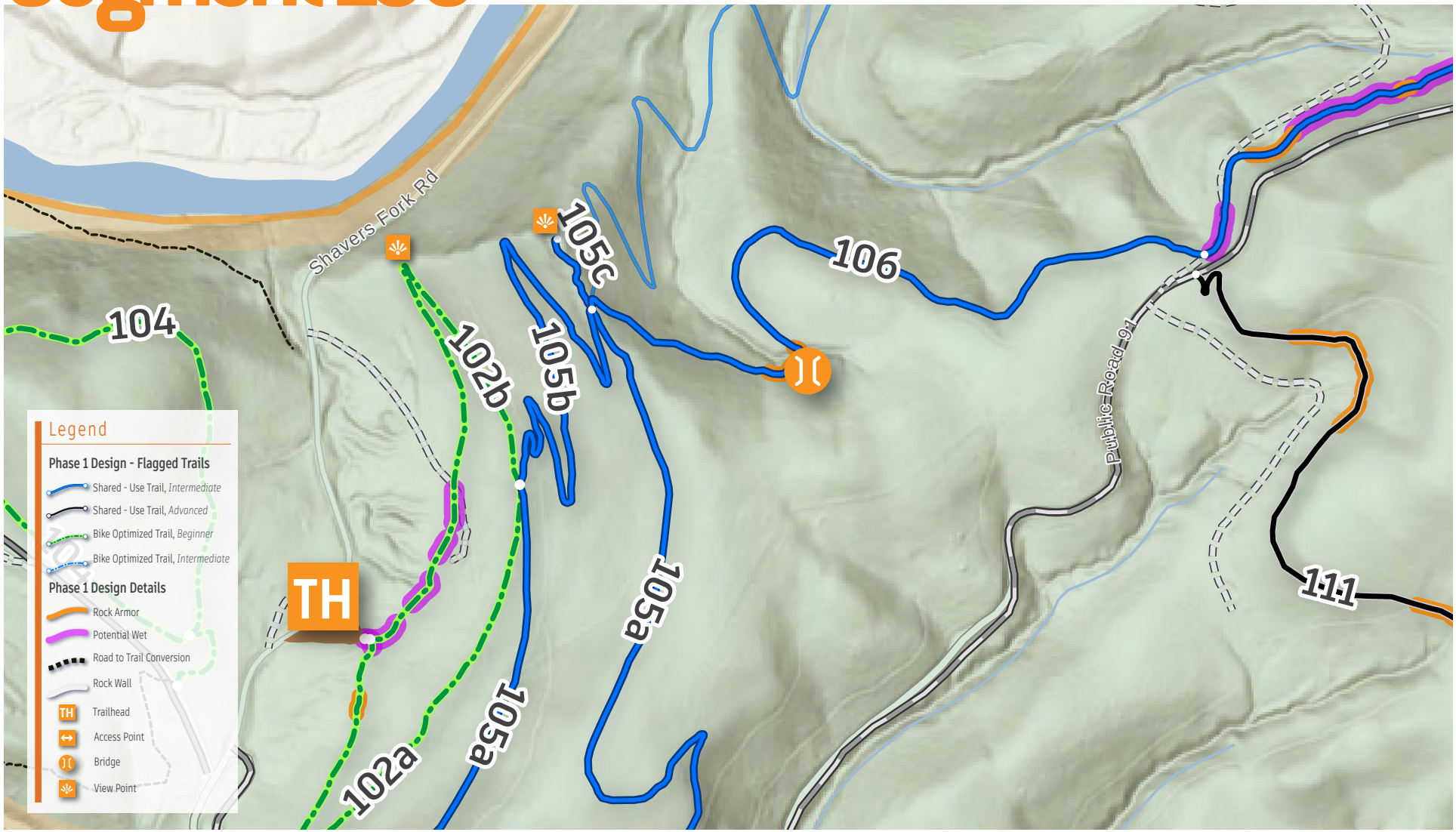
Difficulty: Intermediate
Average Climbing Grade: 8.0%
Average Descending Grade: 0.0%

Trail Elevation Profile



Segment 105c is a short spur trail to a viewpoint overlooking Shavers Fork at the top of the ridge. View enhancements can be made with the removal of a few trees below the ridge. This site creates a nice destination point for casual trail users as well as providing a key way-point for trail users looking to continue up to Bickle Knob

Segment 106

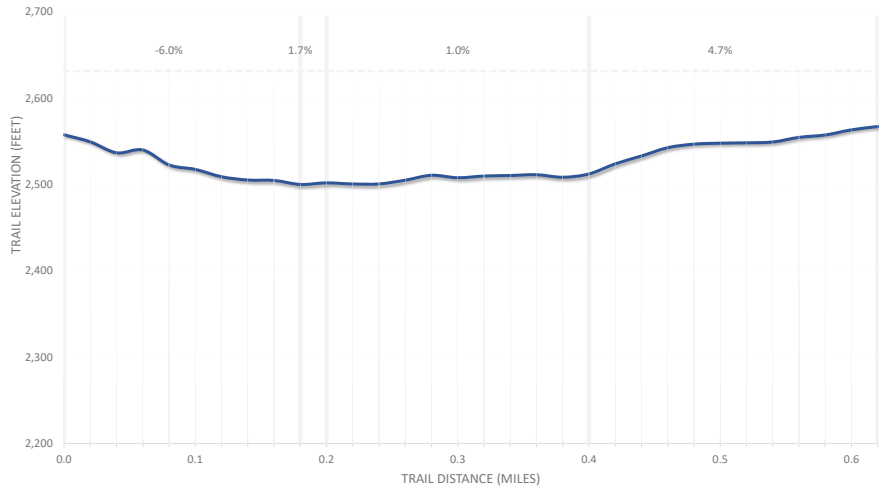


Trail Details:

Flagging Color: Orange
Length: 0.64 miles
Trail Type: Traditional Shared-use

Difficulty: Intermediate
Average Climbing Grade: 2.9%
Average Descending Grade: 6.0%

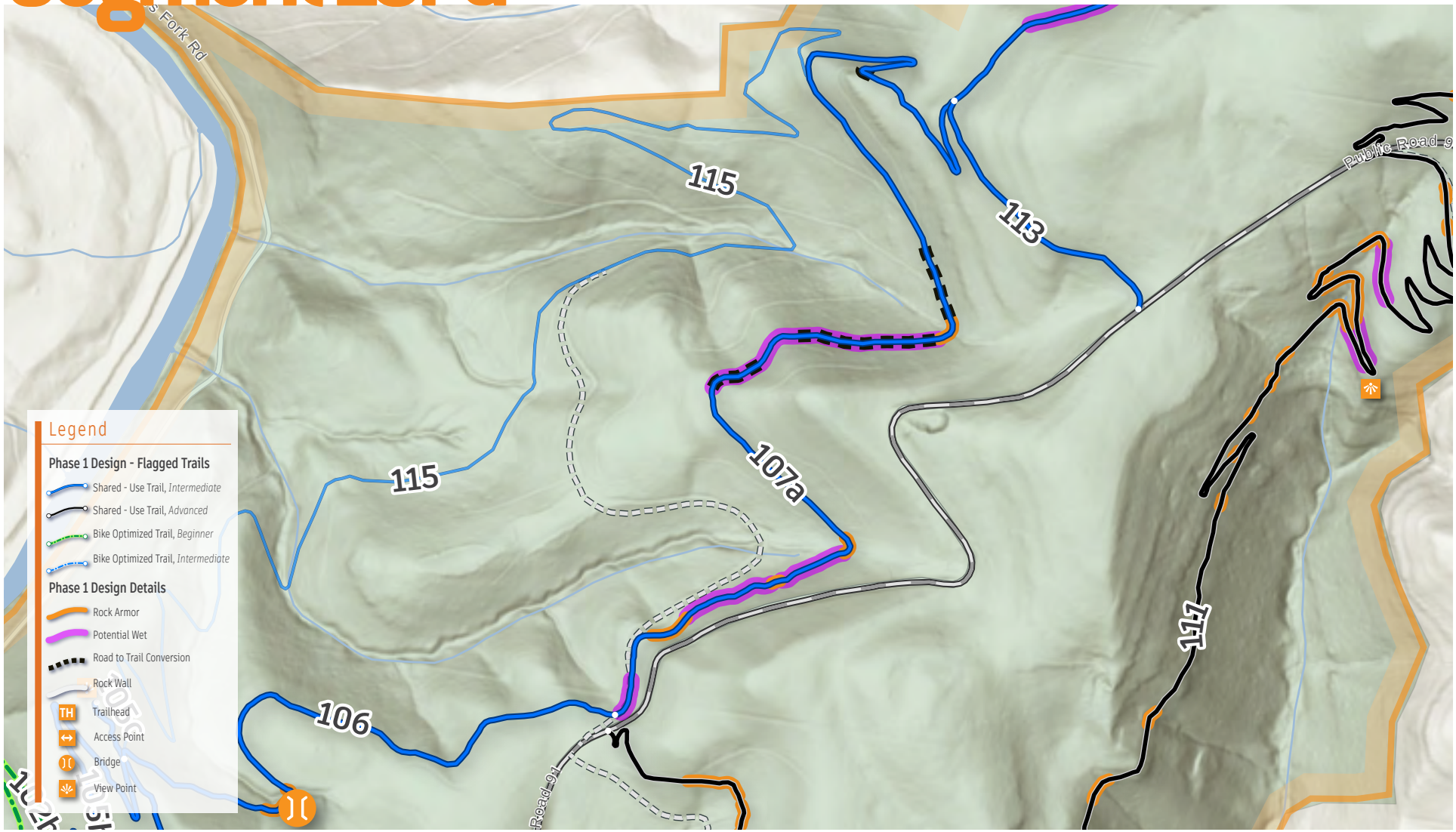
Trail Elevation Profile



Segment 106 will link with segments 107a/b/c/d to provide a continuous singletrack route to the summit of Bickle Knob. It begins by descending from the saddle to a drainage crossing just below the fenced off grazing allotment. A pedestrian bridge will be needed at this site along with stone armoring on each side of the bridge. Bridge design should follow the USDA Forest Service Standard Trail Plans and Specifications for STD 962 — SAWN TIMBER TRAIL BRIDGE. The bridge length is approximately 20’ based on field analysis. Lengths may change during construction. Bridge width should be 5’ wide.

Segment 106 continues below the grazing allotment ascending moderately to link with Forest Road 91C.

Segment 107a

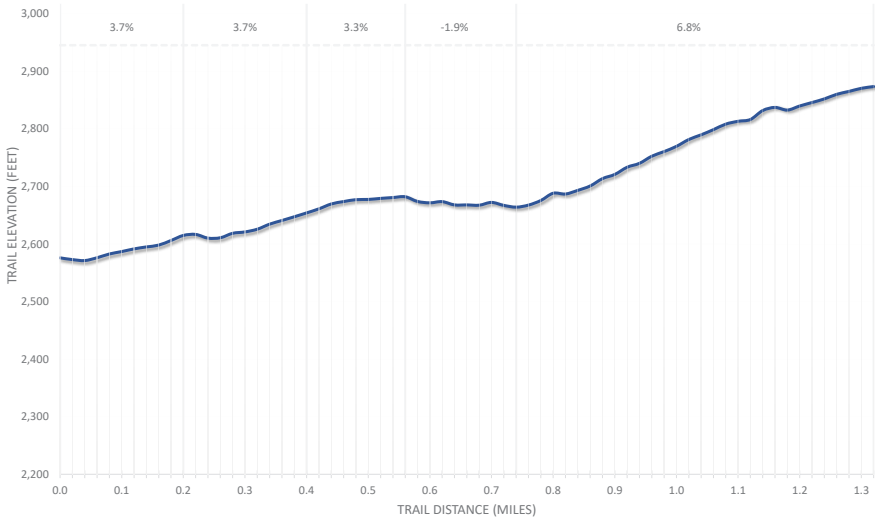


Trail Details:

Flagging Color: Pink
Length: 1.32 miles
Trail Type: Traditional Shared-use

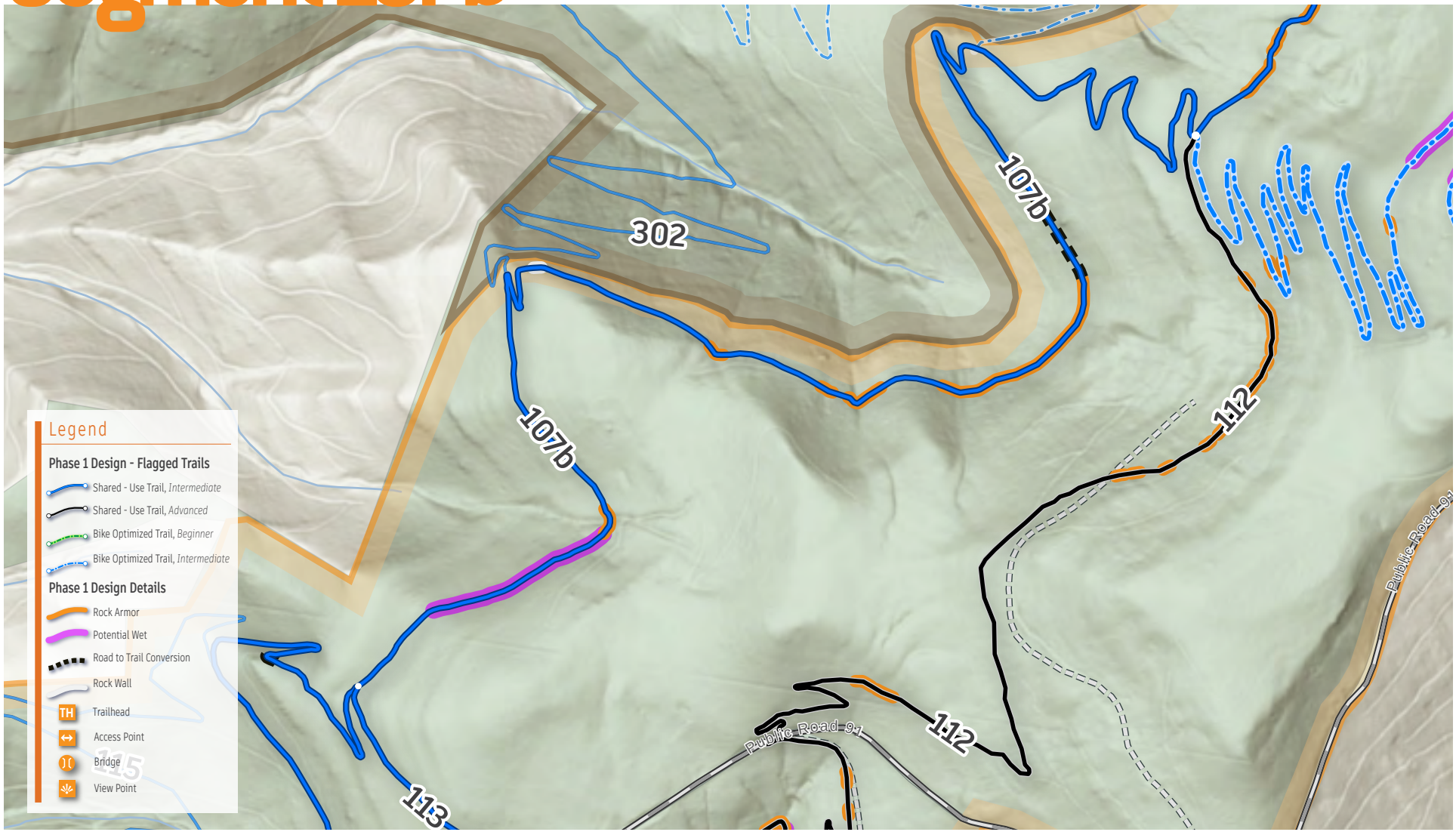
Difficulty: Intermediate
Average Climbing Grade: 5.2%
Average Descending Grade: 1.9%

Trail Elevation Profile



Segment 107a briefly follows FR 91C, utilizing the existing drainage crossing. This area is wet needing drainage maintenance and tread hardening. Just after the crossing the trail begins to climb above FR 91C and below Public Road 91. This section is on north facing slopes and is likely to need additional armoring as it receives sheet flow from the road above. Segments on southern and southwestern aspects have much drier soil profiles. The trail corridor joins with an existing non-system road at the nose of the first ridge. The slopes are again north facing along this section. The road descends to the next drainage crossing at sustainable grades and will allow for road to trail conversion in this location. The existing drainage crossing is at grade and will need armoring. The route leaves the non-system road just after the crossing where the road reaches steeper grades (+25%) and continues to climb to the second ridge in a more sustainable manner.

Segment 107b

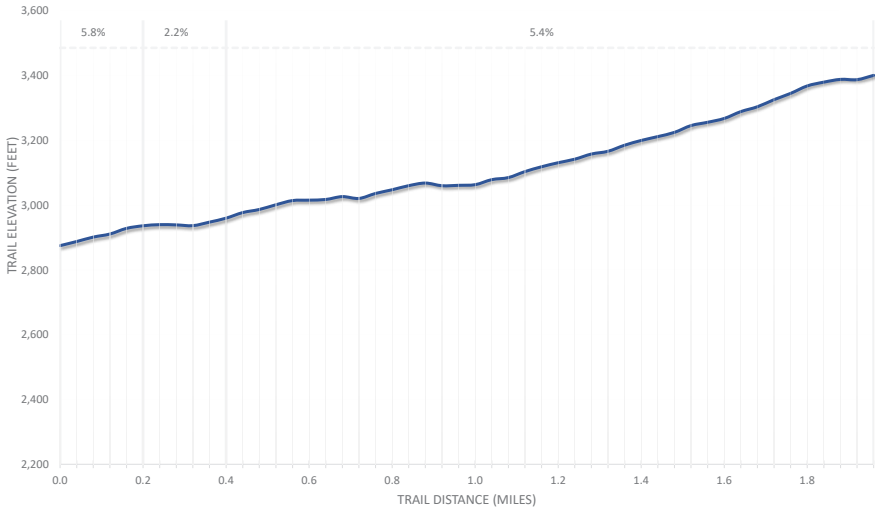


Trail Details:

Flagging Color: Pink
Length: 1.98 miles
Trail Type: Traditional Shared-use

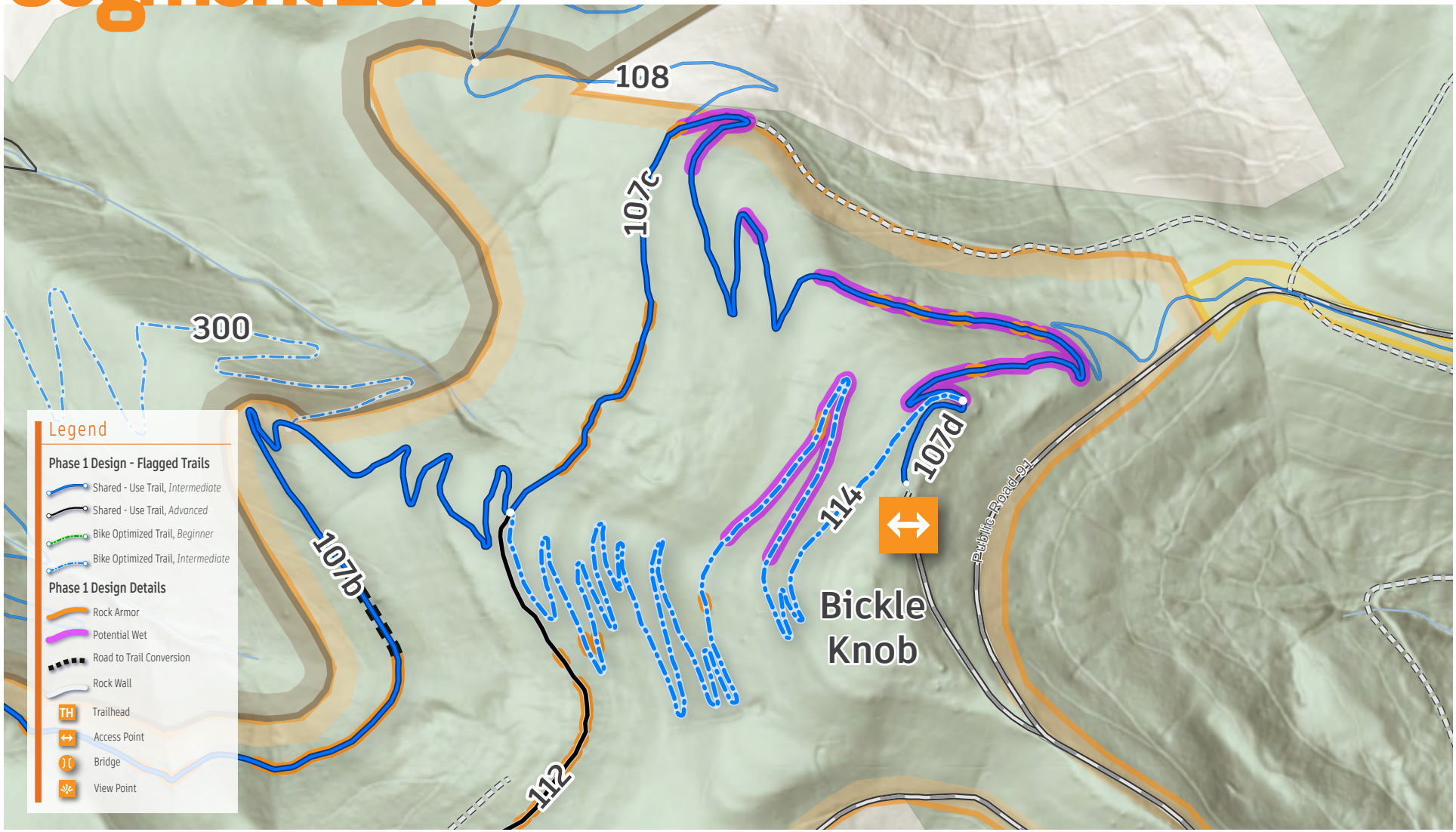
Difficulty: Intermediate
Average Climbing Grade: 5.1%
Average Descending Grade: 0.0%

Trail Elevation Profile



Segment 107b continues along the northwestern facing slopes below a grazing area. The section to the first drainage crossing is likely to need additional armoring. The route crosses the first drainage just below the fence line and continues below the grazing area to the ridge. The terrain becomes increasingly rockier as it reaches the second drainage. This segment will be fairly rugged with large sections of armoring/stone treadway needed to create a navigable bench. The route follows a short segment of non-system road after the drainage crossing. As 107b climbs towards the next ridge the rock content lessens. A series of turns creates a gentle climb as it weaves among some larger rocks to the junction of 107c, 112, and 114.

Segment 107c

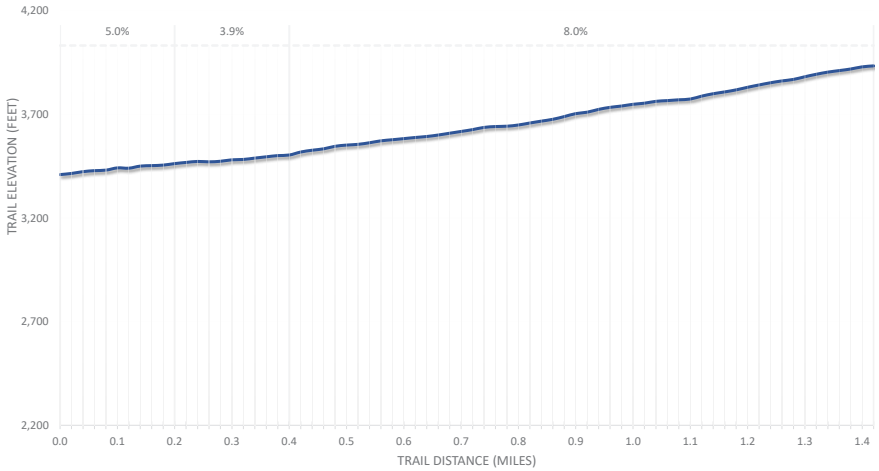


Trail Details:

Flagging Color: Pink
Length: 1.43 miles
Trail Type: Traditional Shared-use

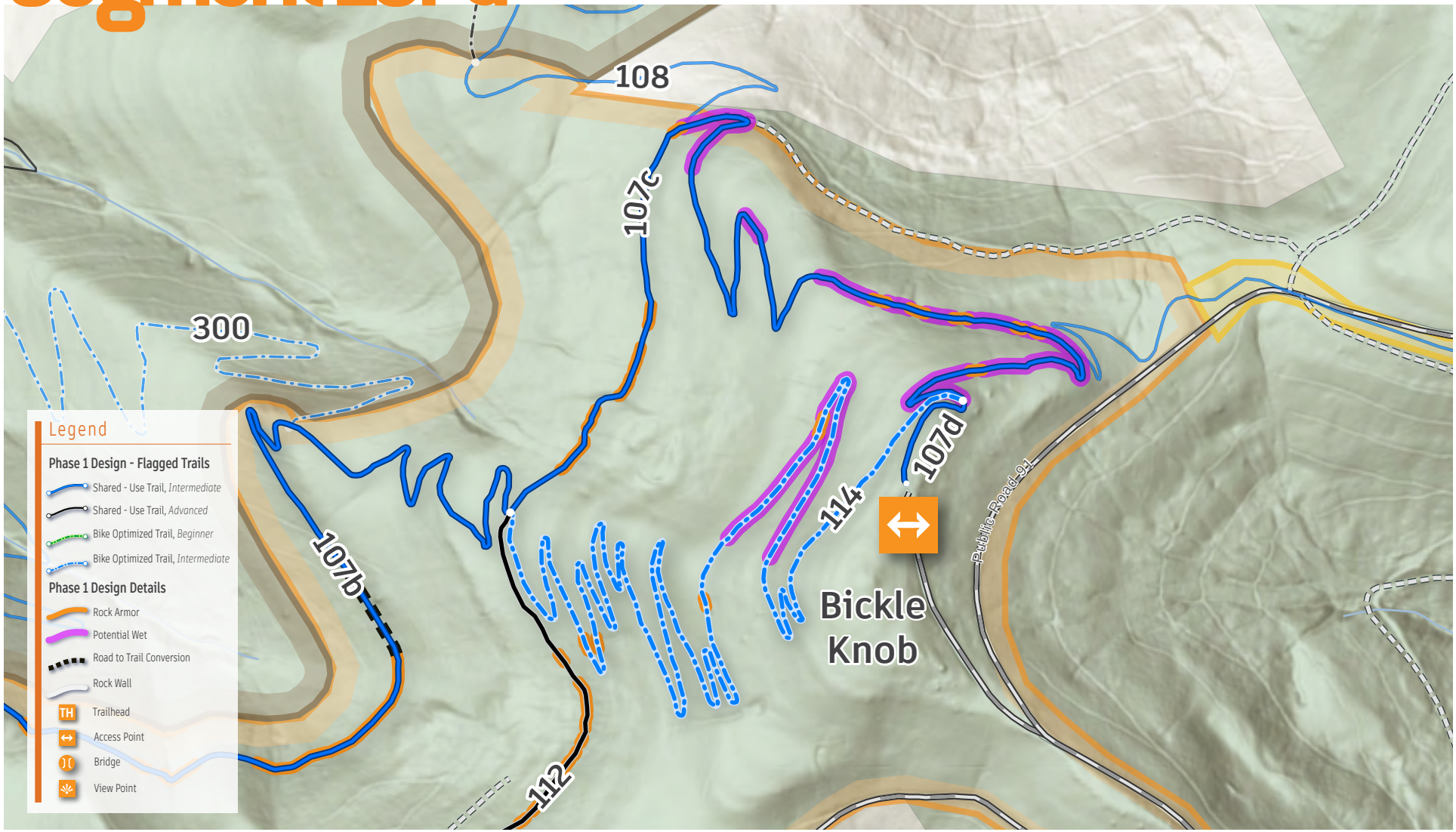
Difficulty: Intermediate
Average Climbing Grade: 7.0%
Average Descending Grade: 0.0%

Trail Elevation Profile



Segment 107c crosses a few smaller drainages where armoring will be needed. The alignment is located higher on the slope to avoid the more concentrated wet areas below. At the ridge, Segment 107c crosses Forest Road 774A. This road is not amenable for trail use with its numerous wet and steep sections. The slopes above have wet areas, but will be easier to manage with armoring at more sustainable grades.

Segment 107d

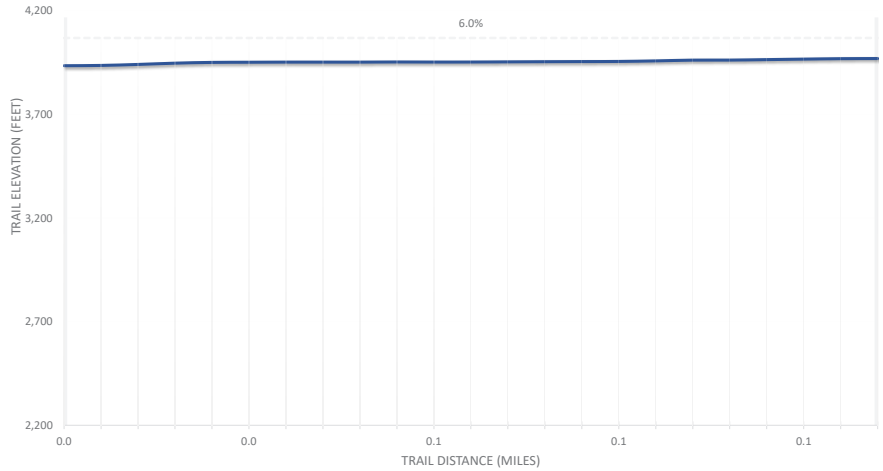


Trail Details:

Flagging Color: Pink
Length: 0.11 miles
Trail Type: Traditional Shared-use

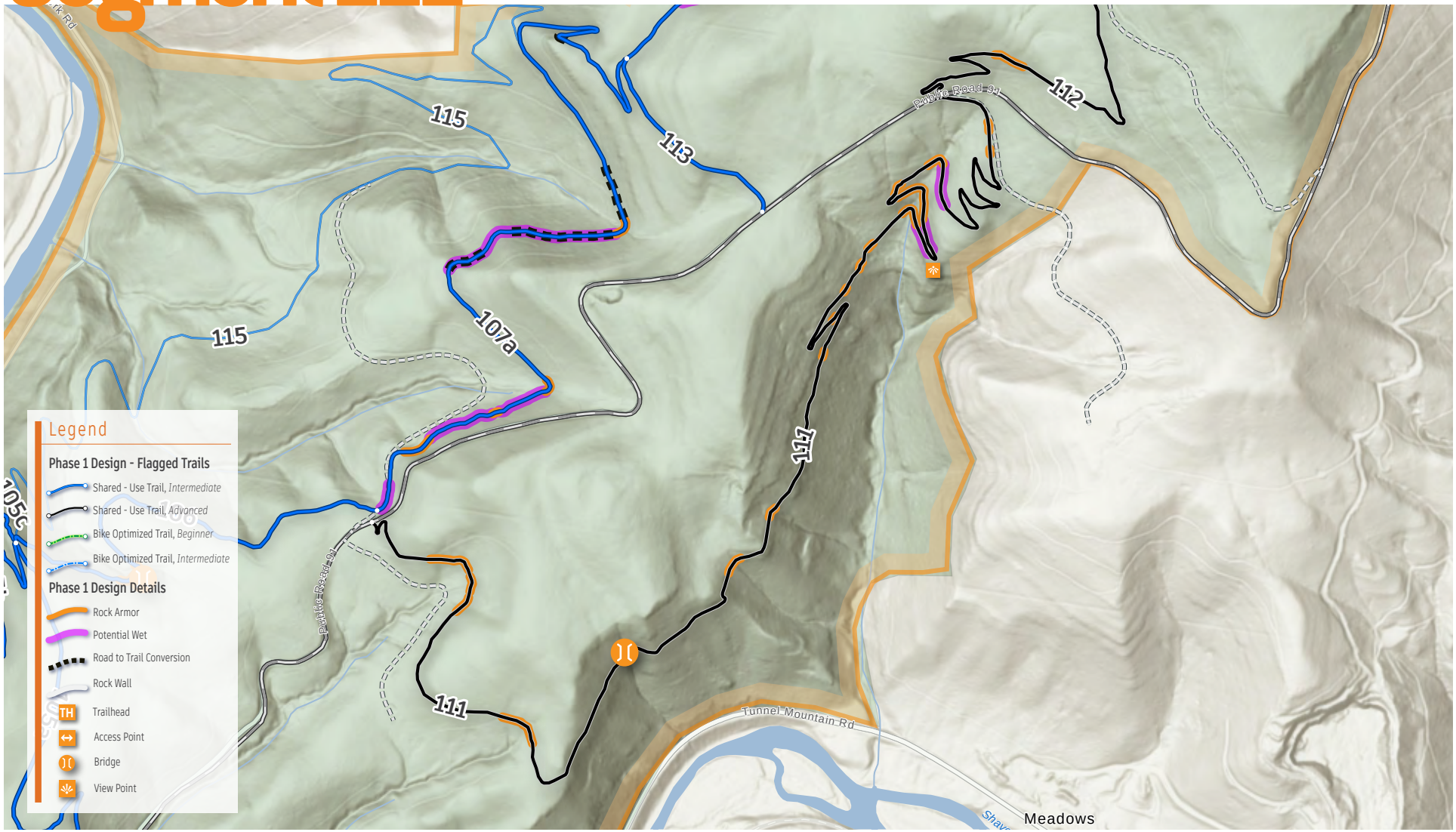
Difficulty: Intermediate
Average Climbing Grade: 6.0%
Average Descending Grade: 0.0%

Trail Elevation Profile



Segment 107d completes the climb to Bickle Knob, a short distance from the junction with Segment 114. It ascends the ridge ending at the existing parking area. The route avoids a steep fall-line section of an existing user created trail. A trail kiosk with map should be installed at the start of the trail near the parking area.

Segment 111

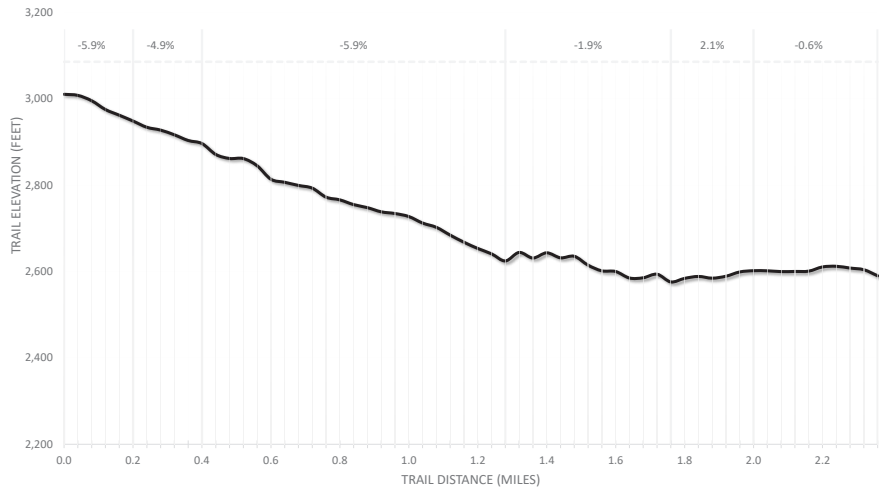


Trail Details:

Flagging Color: Orange
Length: 2.37 miles
Trail Type: Traditional Shared-use

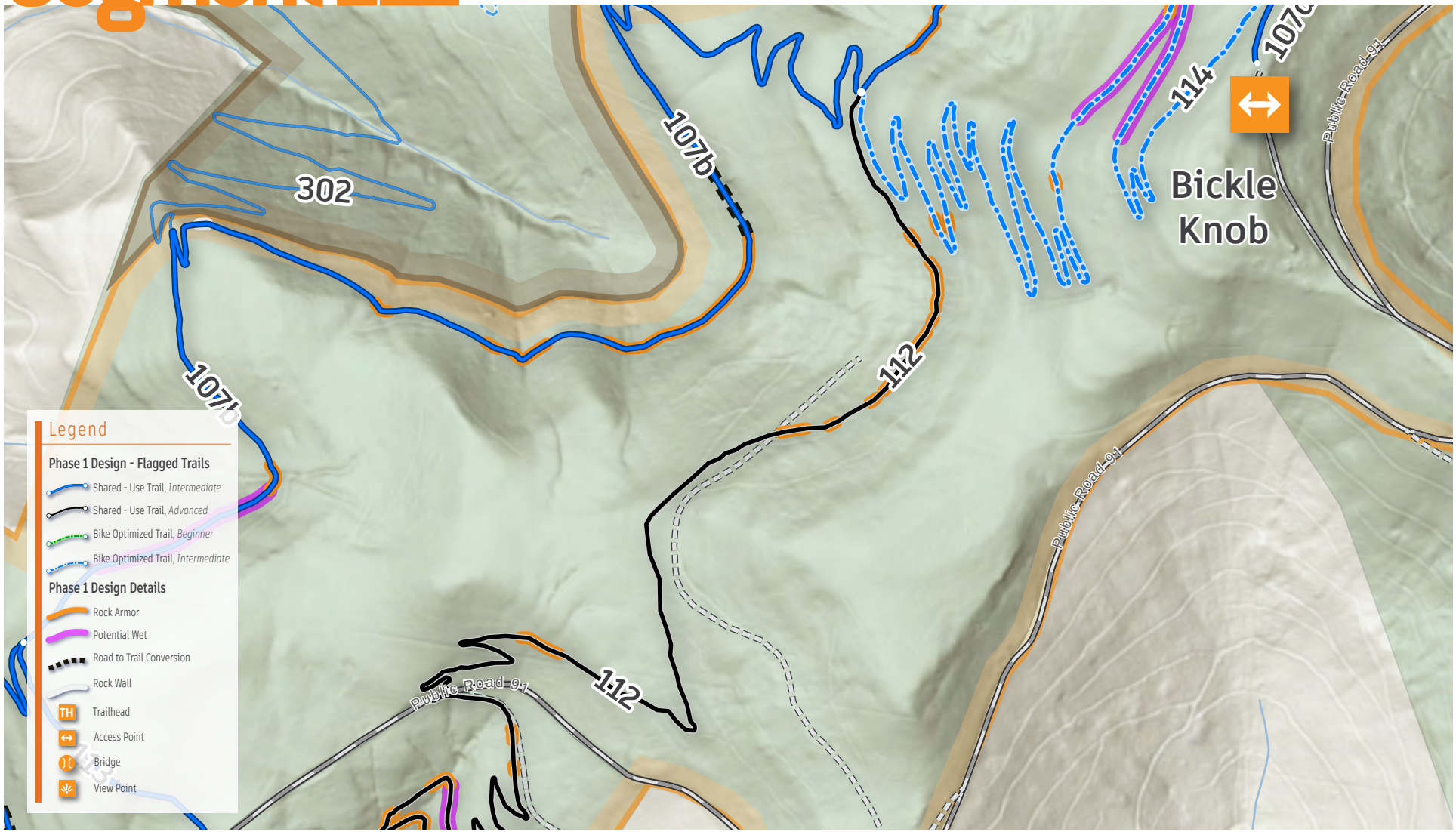
Difficulty: Advanced
Average Climbing Grade: 2.1%
Average Descending Grade: 4.0%

Trail Elevation Profile



Segment 111 is an advanced trail that traverses the dramatic southeastern slopes of Zone 1. Combined with segments 107a/b and 112 a mid mountain loop is created. Segment 111 begins along Forest Road 91E utilizing the existing culvert crossing. Two small armored areas are needed just after the trail leaves the road. These sites are located just downhill of areas on FR91E that have been flagged for buffalo clover. The trail descends gentle slopes along the ridge before crossing the drainage at a rock outcrop. The upper slopes of the hillside are constrained by the grazing area making two additional crossings necessary. The forest opens up providing filtered views of the surrounding landscape as Segment 111 navigates below a series of rock outcrops. A bridge will be needed to cross one of the deeper drainages along the route. Bridge design should follow the USDA Forest Service Standard Trail Plans and Specifications for STD 961-10 — SINGLE LOG STRINGER BRIDGE. The bridge length is approximately 40’ based on field analysis. Lengths may change during construction.

Segment 112

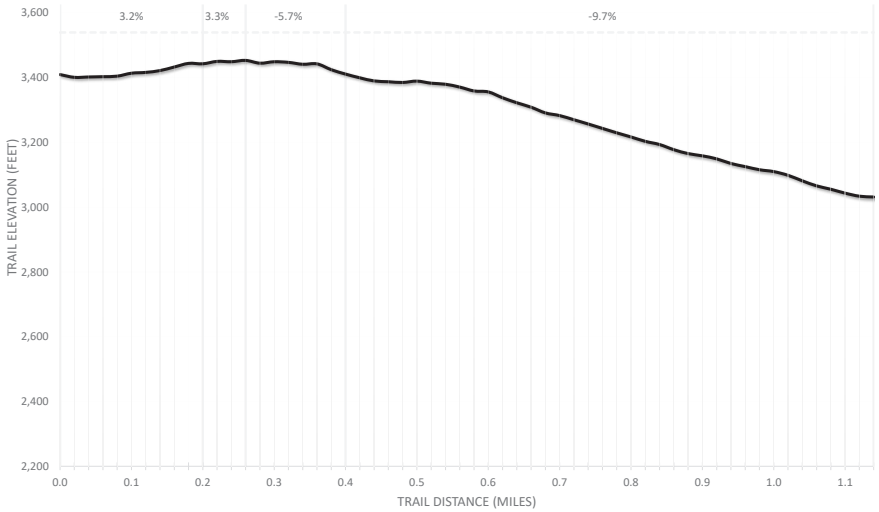


Trail Details:

Flagging Color: Orange
Length: 1.15 miles
Trail Type: Traditional Shared-use

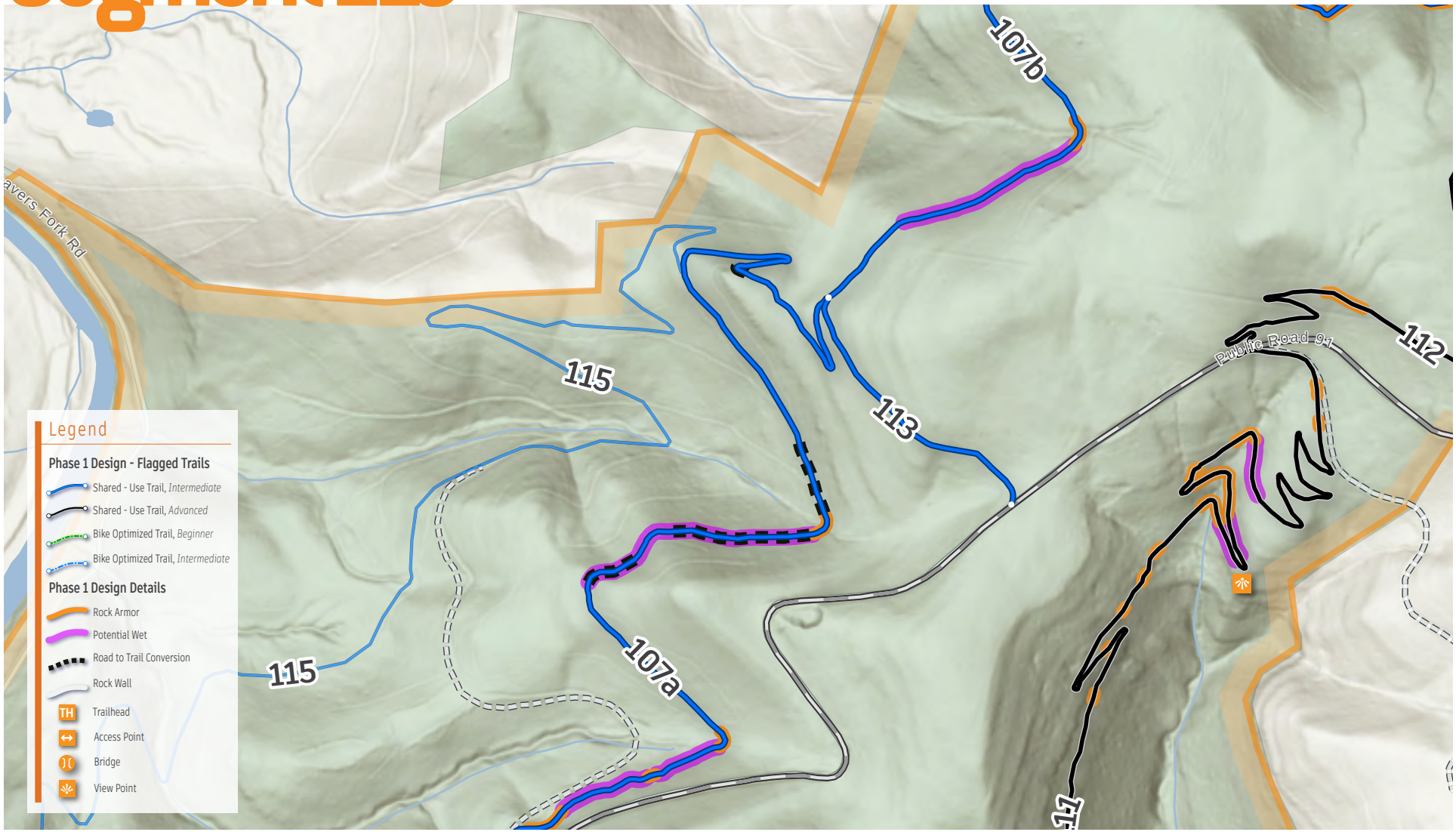
Difficulty: Advanced
Average Climbing Grade: 3.2%
Average Descending Grade: 9.1%

Trail Elevation Profile



Segment 112 links segments 107b/c and 114 to 111. This trail will provide a technical challenge with numerous rock gardens and armored sections. The trail climbs from the junction to a ridge just above the grazing area. It will cross a few small drainages as it traverses the northwestern slopes. It joins a non-system road for a short period. Descending from the ridge along the southwestern slopes, larger rock gardens begin creating a unique trail experience for advanced riders.

Segment 113

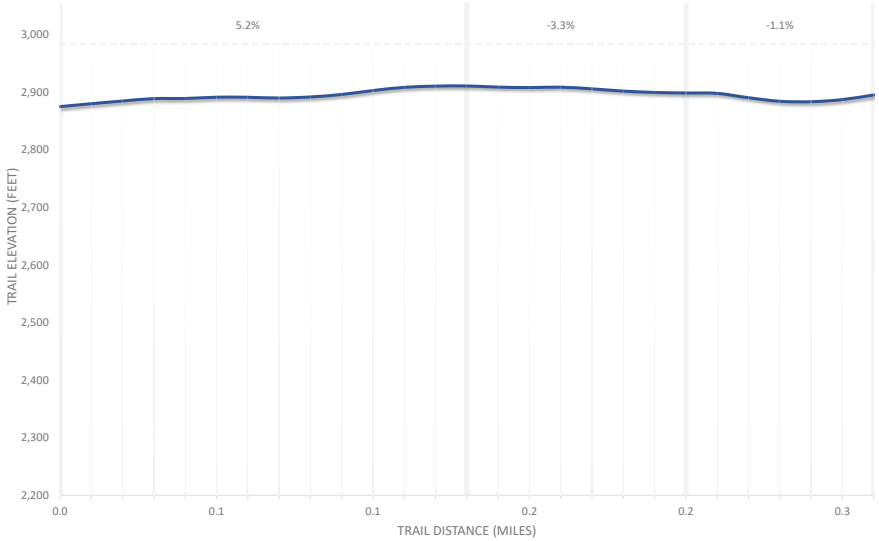


Trail Details:

Flagging Color: Blue
Length: 0.27 miles
Trail Type: Traditional Shared-use

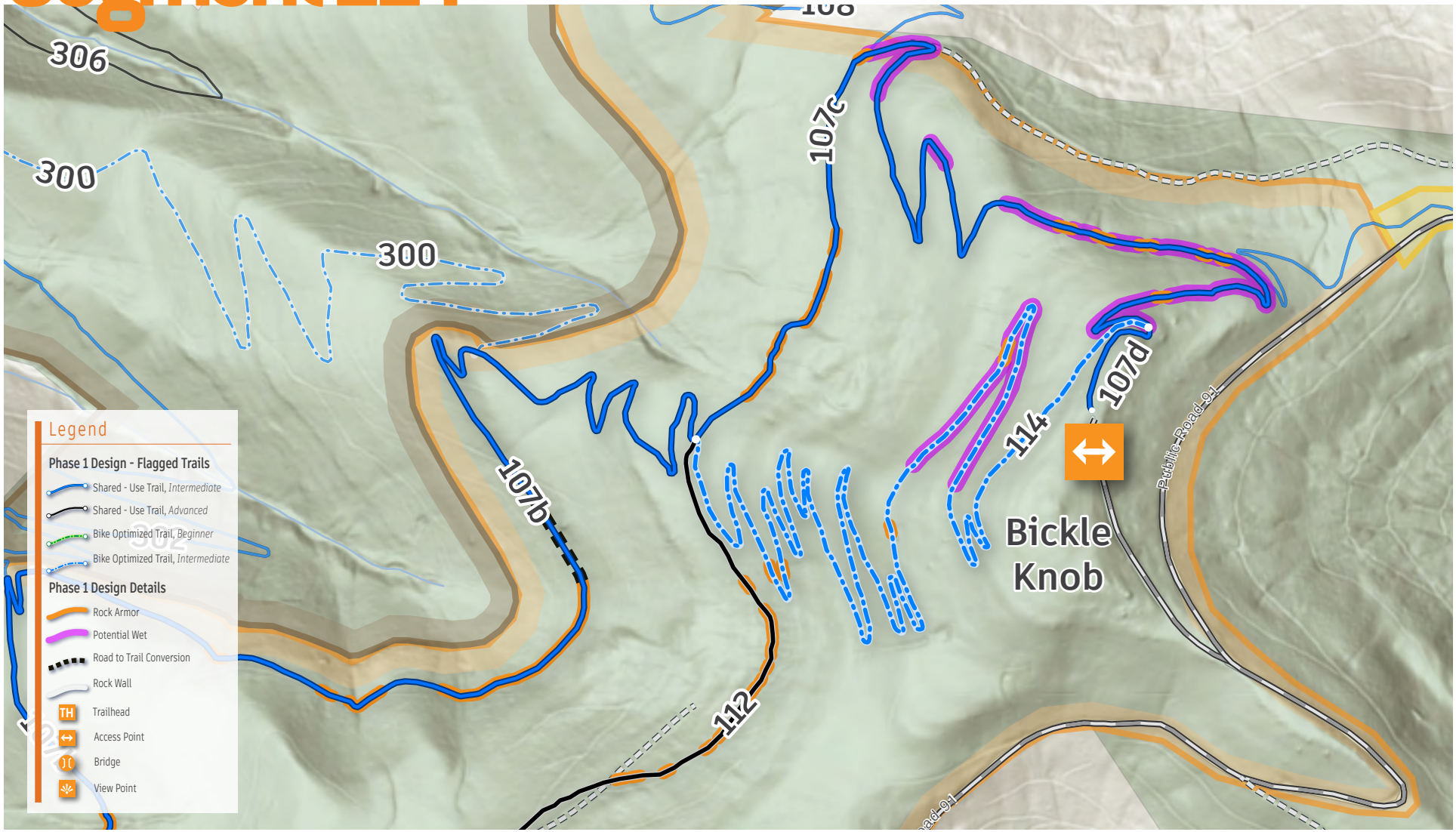
Difficulty: Intermediate
Average Climbing Grade: 5.2%
Average Descending Grade: 2.3%

Trail Elevation Profile



Segment 113 is a short connector trail creating a bailout point midway up the mountain to Public Road 91. The route is dense with thickets of multiflora rose and other invasives. The edge of the road drops off steeply below the grazing area where the trail will need to connect. A wall or gravel ramp will be needed here to make the connection.

Segment 114

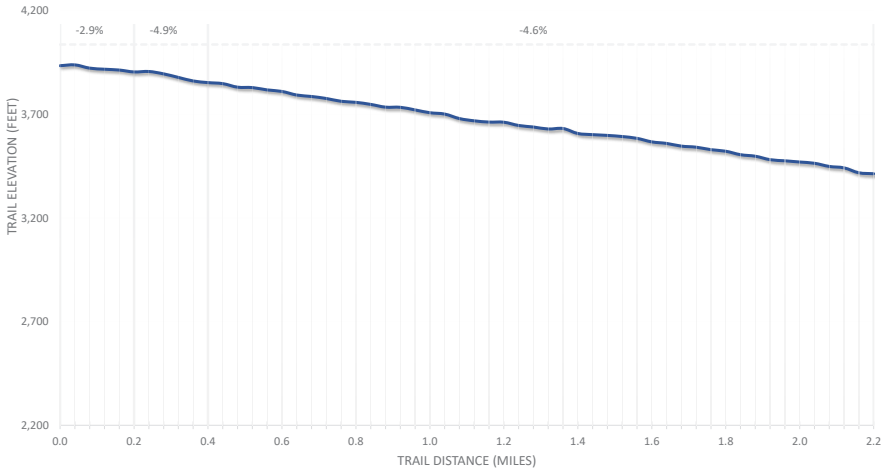


Trail Details:

Flagging Color: Blue
Length: 2.23 miles
Trail Type: Bike-optimized, downhill only

Difficulty: Intermediate
Average Climbing Grade: 0.0%
Average Descending Grade: 4.5%

Trail Elevation Profile



Segment 114 is the only directional trail in Zone 1. This intermediate bike-optimized trail provides a 2.2 mile descent from the summit of Bickle Knob. The upper portion of the trail crosses northwestern slopes that will likely need sections of armoring. The majority of the trail descends through open hardwood forest on the drier southwestern side of the Knob.

TRAIL DESIGN INVENTORY & SPECIFICATIONS

Elkins Area Trail Planning & Design - Phase 1 Flagged Trails									
Name	**Zone**	**Zone Number**	**Style**	**Skill**	**USFS Trail Class**	**User**	**Direction**	**Flag Color**	**Length Miles**
102A	Stuart	1	Bike Optimized	Beginner	3	Shared-Use	Bidirectional	Blue	0.50
102B	Stuart	1	Bike Optimized	Beginner	3	Shared-Use	Bidirectional	Blue	0.48
104	Stuart	1	Bike Optimized	Beginner	3	Shared-Use	Bidirectional	Blue	0.88
105A	Stuart	1	Traditional	Intermediate	3	Shared-Use	Bidirectional	Pink	1.05
105B	Stuart	1	Traditional	Intermediate	3	Shared-Use	Bidirectional	Pink	0.55
105C	Stuart	1	Traditional	Intermediate	3	Shared-Use	Bidirectional	Blue	0.06
106	Stuart	1	Traditional	Intermediate	3	Shared-Use	Bidirectional	Orange	0.64
107A	Stuart	1	Traditional	Intermediate	3	Shared-Use	Bidirectional	Pink	1.32
107B	Stuart	1	Traditional	Intermediate	3	Shared-Use	Bidirectional	Pink	1.98
107C	Stuart	1	Traditional	Intermediate	3	Shared-Use	Bidirectional	Pink	1.43
107D	Stuart	1	Traditional	Intermediate	3	Shared-Use	Bidirectional	Pink	0.11
111	Stuart	1	Traditional	Advanced	3	Shared-Use	Bidirectional	Orange	2.37
112	Stuart	1	Traditional	Advanced	3	Shared-Use	Bidirectional	Orange	1.15
113	Stuart	1	Traditional	Intermediate	3	Shared-Use	Bidirectional	Blue	0.27
114	Stuart	1	Bike Optimized	Intermediate	3	Bike Only	Downhill	Blue	2.23
Total									15.03

Elkins Area Trail Planning & Design - Trail Unit Inventory

Segment ID	Length Miles	Rock Armor (LF)[2]	Rock Wall (LF)[4]	Potential Wet (LF)	Road to Trail Conversion	Bridge Crossing (LF)[3]	Elevated Platform Turn (EA)[1]	Elevated Berm Turn (EA)[1]	Non-Elevated Turn (EA)[1]
102A	0.50	66.42		28.25					1
102B	0.48			445.6			1		
104	0.88						2		2
105A	1.05						1		
105B	0.55						6		
105C	0.06								
106	0.64	170.62				20	1		
107A	1.32	451.73		2070.62	1417.46		3		
107B	1.98	1425.32	38.08	879.61	475.86		8		1
107C	1.43	964.8		2997.31			5		1
107D	0.11						1		
111	2.37	1972.52		638.21		40	10		1
112	1.15	698.9					5		
113	0.27								
114	2.23	250.51		1770.29				17	
Total	**15.03**	**6000.82**	**38.08**	**8829.89**	**1893.32**	**60**	**43**	**17**	**6**

Footnotes

1. Turns are field designed. Turn quantities should not alter without written permission of the Client.
2. Rock armor quantities are based on field analysis and trail design. Rock armor quantities may change during construction.
3. Bridge crossing lengths are based on field analysis and trail design. Bridge lengths may change during construction.
4. Rock wall quantities are based on field analysis and trail design. Rock wall quantities may change during construction.

Trail Specifications

Trail Type	Unit	Directional	Feature Frequency[1]	Constructed Tread Width[2,3]	Ave Trail Grade per 1000'	Max Trail Grade: climbing[4]	Max Trail Grade: descending[4]	Proposed Flagline Corridor Width	Corridor Width (4' above tread)	Corridor Height Minimum[5]	Exposure (without railing)	Avoidable Obstacles (over 50% of tread or less)
Beginner Bike-Optimized	Linear Feet	Bi-directional	Low	48"-60"	5%	10%	15%	50'	60"-72"	8'	N/A	less than 2" partial width of tread or less than 5" full width of tread
Intermediate Traditional	Linear Feet	Bi-directional	Medium	24"-48"	7-10%	15%	20%	50'	30"-42"	8'	less than 48"	less than 8"
Intermediate Bike-Optimized	Linear Feet	Bi-directional	Medium	24"-48"	7-10%	15%	20%	50'	30"-42"	8'	less than 48"	less than 8"
Advanced Traditional	Linear Feet	Bi-directional	Medium	18"-30"	10%	20%	40%	50'	30"-42"	8'	less than 48"	less than 16"
Advanced Bike-Optimized	Linear Feet	Bi-directional	Medium-High	24"-42"	15%	20%	50%	50'	48"-72"	8'	less than 48"	less than 16"

Footnotes

1. Feature Frequency is averaged over long distances. Per 100': "low" = 2-3 features, "med" = 3-5 features, "high" = 5-10 features.
2. Constructed tread width may narrow over short distances to 50% of spec. Examples include rock or tree gateways.
3. Tread width also applies to bridges and boardwalks. Check with local regulations for overriding guidelines on width or any other requirements (height restrictions, railings, etc.).
4. Max grades climbing and descending refer to extremely short segments, 10 feet or less.
5. Corridor height should be reduced in thick laurel or rhododendron where appropriate to provide a more natural "tunnel experience".
6. Rugosity attempts to capture average tread coarseness. Tread area with obstacles: "low" = less then 5%, "med" = less then 20%, "high" = over 20%, "very high" = over 50%. Check Master Plan and Trail Guidelines by Difficulty Level for surface texture details.

General Notes

Sustainable trails guidelines provide the foundation for all design + construction decisions ("half rule", frequent grade reversals, max grades function of soils + use, etc.).
All trails should have a minimum grade and camber (in/outslope) of 3% to ensure a well-drained tread.

Trail Type	Rollable Feature Height (jumps, berms, etc.)	Rugosity (surface texture)[6]	Tread and trail features	Experience Notes
Beginner Bike-Optimized	6"-18"	Low	Semi-firm trail surface. May include rock surfacing.	Typically specified for easiest trail difficulties. Trail grades are gentle and set on shallow cross slopes with little to no exposure to trail side risks like steep slopes, cliffs, or external influences that require advanced bike handling moves to avoid. In general, the trail surface is relatively smooth with little to no obstacles (rocks and roots). Feature frequency is appropriate for the shared-use nature while keeping it engaging for intermediate riders advancing their skills. Tread width, turns, bridges, and pinch points should accommodate Adaptive Mountain Bikes to the extent possible.
Intermediate Traditional	12"-24"	Medium	Semi-firm to loose trail surface. Will include rock surfacing. Rocks will be uneven.	This trail type will have the look and feel of traditional shared-use singltrack. Trail grades are moderate and set on moderate to steep cross slopes. In general, the trail surface is semi-firm with some natural obstacles (rocks and roots). Feature frequency is appropriate for the shared-use nature while keeping it engaging for intermediate riders advancing their skills. Tread width, turns, bridges, and pinch points should accommodate Adaptive Mountain Bikes to the extent possible.
Intermediate Bike-Optimized	24"-48"	Medium	Semi-firm trail surface. May include rock surfacing.	Specified for the intermediate trails. Trail grades are moderate and set on moderate to steep cross slopes with some exposure such as steep slopes or cliffs. In general, the trail surface is semi-firm with some natural obstacles (rocks and roots). Feature frequency is appropriate for the shared-use nature while keeping it engaging for intermediate riders advancing their skills. Tread width, turns, bridges, and pinch points should accommodate Adaptive Mountain Bikes to the extent possible.
Advanced Traditional	24"-48"	High	Unpredictable trail surface. Will include rock surfacing. Rocks will be uneven.	This trail type looks and feels like traditional singletrack with narrow tread and the presence of rocks, roots, and other obstacles. Grades are steeper than beginner and intermediate trails and may exceed the physical climbing/descending limits of some hikers and riders. Highly unpredictable trail surface with high rugosity is expected.
Advanced Bike-Optimized	No restrictions	Medium-High	Semi-firm to loose trail surface. Will include rock surfacing. Rocks will be uneven.	Specified for advanced bike-only trails. Trails are bike-optimized. These trails traverse side slopes ranging from 20%-120%, therefore users are exposed to steep hills and rocky drop offs. The trail surface is variable with the presence of rocks and roots. Feature frequency is determined by specific trail narratives.

Turn Specifications

Trail Type	Unit	Min Turn Radius	Max Turnpad Grades[1]	Max Berm/Turn Camber[2]	Tread and trail features	Experience Notes
Elevated Platform Turn	Each	8'	20%	20%	Firm trail surface. May include rock surfacing.	The turn utilizes a platform to provide the user with a space to complete a turn and ensure the sustainable grades. This turn type is common where the side slopes are steep and would create a fall-line configuration if a non-elevated turn was used. The turn grades are steeper to allow for elevation gain or loss where needed to achieve key control points or for desired experience. Located on steeper side slopes where a small footprint is needed to fit turns on these slopes.
Elevated Berm Turn	Each	10'	20%	50%	Semi-firm trail surface. May include rock surfacing.	An open radius turn, typically raised though may rely heavily on a tall berm to hold riders on trail as they corner with speed. Generally used on Bike-optimized or gravity bike-only trails. Turns should wide and provide conservation of rider momentum with little to no force braking. Turns should include insloping and berm to hold rider into the turn and offer positive support through the entire turn.
Non-Elevated Turn	Each	20'	10%	25%	Firm trail surface. May include rock surfacing.	Sweeping long radius turns comfortable for shared users of beginner to intermediate ability levels. In combination with good sight lines, these turns work well for shared-use trails. Generally these are climbing or decending turns on mellow to moderate sideslopes without the need for an elevated platform. The turn width will vary depending on the difficulty rating of the trail. Careful attention is required to ensure the tread properly drains and the grades follow the half-rule. Exceeding the half-rule may result in the trail following a fall-line configuration, leading to a rutted trail, increased maintenance, and decreased quality of the user experience.
Non-Elevated BermTurn	Each	15'	15%	30%	Semi-firm trail surface. May include rock surfacing.	Sweeping long radius turns with cambered berms. Generally used on MBO trails for beginner to advanced ability levels to allow riders to carve into a turn and retain speed while doing downhill. Generally these are climbing or decending turns on mellow to moderate sideslopes. The turn features a filled (bermed) concave turning surface to enhance the flow experience. A platform is not necessary for this turn type where side slopes allow.

Footnotes

1. Turnpad grade measures the rise/fall across the turning surface at the base of any inslope.
2. Max camber is measured at the top of the inslope. Turns can not be outsloped.

General Notes

Sustainable trails guidelines provide the foundation for all design + construction decisions ("half rule", frequent grade reversals, max grades function of soils + use, etc.).
All trails should have a minimum grade and camber (in/outslope) of 3% to ensure a well-drained tread.

STUART TRAILHEAD

Parking is limited in the Stuart area and a new trailhead should be developed to provide access for users of this new trail network. A location was selected during the field design site visit across from the group camp site along Shavers Fork Road. The area identified was flagged with purple flagging around the perimeter. The site is approximately 0.5 acres in size. Access via a short loop driveway should be developed to provide access to parking and provide some separation from the group camping across the road. Tree islands can be left in the center with 20-24 vehicle spaces developed for trail users along the access drive.

In addition to parking areas – restrooms, water, changing stations, bike repair station, informational signage, seating areas and other trailhead amenities welcome visitors while enhancing the trail experience. A small picnic facility could be developed in the tree island in the center. Vault toilets for trail users would help mitigate any conflicts with the group camp site.

Trailhead kiosks at all trailheads and key access points will be important to provide visitors with information about the trail network. Interpretive kiosks with trail maps should be provided and include route finding information, necessary safety information, user etiquette, and park rules. Wayfinding signage is recommended to guide users along the trails and include information on the different trail types, ability levels, directionality, and allowed user groups.


Shavers Fork Rd
Picnic Area
TH
Parking Loop
Shavers Fork Rd
Shavers Fork Rd
Public Road 91

IMPLEMENTATION AND NEXT STEPS

Design Memo Review

To bring this design to fruition, the next step is to share this memo and supporting maps with the appropriate stakeholders and staff to gather feedback and devise next steps.

Permitting and Compliance

All construction projects are subject to regulatory requirements. Obtaining proper permits can ensure that work follows local, state, and federal laws as this trails concept plan is implemented. At least as important, working under permits can help trail builders and visitors to be good stewards of the land.

This planning and design project was guided by the EAST Planning Guidance document for the MNF provided by the USFS Cheat-Potomac Ranger District. Additional National Environmental Policy Act (NEPA) review will be necessary prior to construction.

Utility Locate

It is against state law to excavate or grade without a utility location. It is extremely important that contractors notify the applicable organizations in a timely fashion for utility location services prior to construction.

Construction

The trails recommended in this plan require extensive mechanized construction and knowledge of sustainable trail building practices. IMBA Trail Solutions recommends that a qualified team of professional trail builders bring these trails into reality. IMBA Trail Solutions also recommends professional guidance for management purposes of the project to ensure successful trails that are low maintenance, provide high-quality experiences, and meet the design.

Maintenance and Stewardship

Maintenance is an ongoing cost and should be planned and budgeted from the onset of a project. Trails should be managed according to trail type guidelines, respective trail narratives, and recommended difficulty levels. Typical annual maintenance budgets for traditional and mountain bike-optimized trails range from 5% to 15% of the construction cost. Some of the annual maintenance for trails can be performed by trained volunteers. These tasks will include corridor trimming, downed tree removal, tread clearing, and minor drainage work. Professional assistance will be required occasionally. Increasingly, mountain bike trail systems are hiring part- or full-time staff to provide maintenance to trail systems. Ensuring a quality, consistent riding experience is key to attracting visitors and keeping a local riding community satisfied and growing.

Elkins Area Trail Planning & Design - Cost Opinion Phase 1 Trails								
Name	Style	Skill	Direction	Length Miles	Unit Cost Low	Unit Cost High	Estimated Cost Low	Estimated Cost High
102A	Bike Optimized	Beginner	Bidirectional	0.50	$ 70,000.00	$100,000.00	$ 35,276.55	$ 50,395.07
102B	Bike Optimized	Beginner	Bidirectional	0.48	$ 70,000.00	$100,000.00	$ 33,514.07	$ 47,877.25
104	Bike Optimized	Beginner	Bidirectional	0.88	$ 70,000.00	$100,000.00	$ 61,632.53	$ 88,046.47
105A	Traditional	Intermediate	Bidirectional	1.05	$ 55,000.00	$100,000.00	$ 57,697.94	$ 104,905.34
105B	Traditional	Intermediate	Bidirectional	0.55	$ 55,000.00	$100,000.00	$ 30,462.88	$ 55,387.06
105C	Traditional	Intermediate	Bidirectional	0.06	$ 55,000.00	$100,000.00	$ 3,377.86	$ 6,141.56
106	Traditional	Intermediate	Bidirectional	0.64	$ 55,000.00	$100,000.00	$ 35,085.34	$ 63,791.53
107A	Traditional	Intermediate	Bidirectional	1.32	$ 55,000.00	$100,000.00	$ 72,854.09	$ 132,461.99
107B	Traditional	Intermediate	Bidirectional	1.98	$100,000.00	$150,000.00	$ 198,143.37	$ 297,215.06
107C	Traditional	Intermediate	Bidirectional	1.43	$100,000.00	$150,000.00	$ 142,736.34	$ 214,104.51
107D	Traditional	Intermediate	Bidirectional	0.11	$ 55,000.00	$100,000.00	$ 6,090.43	$ 11,073.51
111	Traditional	Advanced	Bidirectional	2.37	$ 55,000.00	$100,000.00	$ 130,537.06	$ 237,340.12
112	Traditional	Advanced	Bidirectional	1.15	$100,000.00	$150,000.00	$ 115,433.76	$ 173,150.65
113	Traditional	Intermediate	Bidirectional	0.27	$ 55,000.00	$100,000.00	$ 14,645.33	$ 26,627.88
114	Bike Optimized	Intermediate	Downhill	2.23	$ 70,000.00	$100,000.00	$ 156,098.30	$ 222,997.57
Total				**15.03**			**$ 1,093,585.87**	**$ 1,731,515.56**

Notes: Cost opinions are for planning purposes only. This conceptual cost opinion provides ranges for the cost of construction and serves as a tool for planning purposes only. The cost opinion does not serve as a bid and does not include cost of permitting, construction documents, and contractor mobilization or contingency.