INTERURBAN TRAIL | **SITE DESIGN**

TO: Hanae Garrison, Royal River Conservation Trust
FROM: Mindee Goodrum, FB Environmental Associates
SUBJECT: **Interurban Trail Improvements, Technical Assistance Site Design Report**
DATE: June 10, 2026
CC: Amelia Wallis and Forrest Bell, FB Environmental Associates

SITE LOCATION

The Interurban Trail is a multi-use trail that was formerly a railroad line connecting Portland and Lewiston. This project addresses an approximately 1,940 foot segment of the Interurban Trail, spanning from Intervale Road to the Foxcroft Multi-use Trail intersection and existing bridge crossing over Stevens Brook. This section of the trail falls within the Intervale Preserve, owned and managed by the Royal River Conservation Trust (RRCT). The preserve covers 328-acres in total within New Gloucester, conserving important habitat in the Royal River watershed and providing various recreational opportunities. Within the study segment, the trail is generally flat (approximately a 2% grade).

DESCRIPTION OF IDENTIFIED PROBLEMS

FB Environmental (FBE) technical staff and project partners from the Royal River Conservation Trust completed a walkthrough of the trail on April 9, 2026. Existing site photos are provided in Attachment 1.

Stormwater runoff, trail compaction, and a lack of stormwater management measures has created areas of erosion and waterlogging along the Interurban Trail. Along some sections of the trail, preexisting earthen berms line one or both edges of the trail, preventing water from draining downslope and creating waterlogged conditions on the trail during and after rainstorms and snowmelt. Over time, water has channelized on the trail in some sections, creating erosion gullies. Historical water pooling during wet seasons has caused soft, organic soil to accumulate along segments of the trail. And in some areas even develop deep muck. In other segments of the trail, the surface consists of a gravel-sand mixture, likely fill from the historic rail bed.

Trail recommendations are broken into seven segments to represent the varying conditions along the trail (Figures 1-3). Waterbars will be spaced approximately 250 feet apart along the trail, and the entire trail (within the project limits) will be enhanced with fresh gravel to improve recreational use and mitigate erosion.

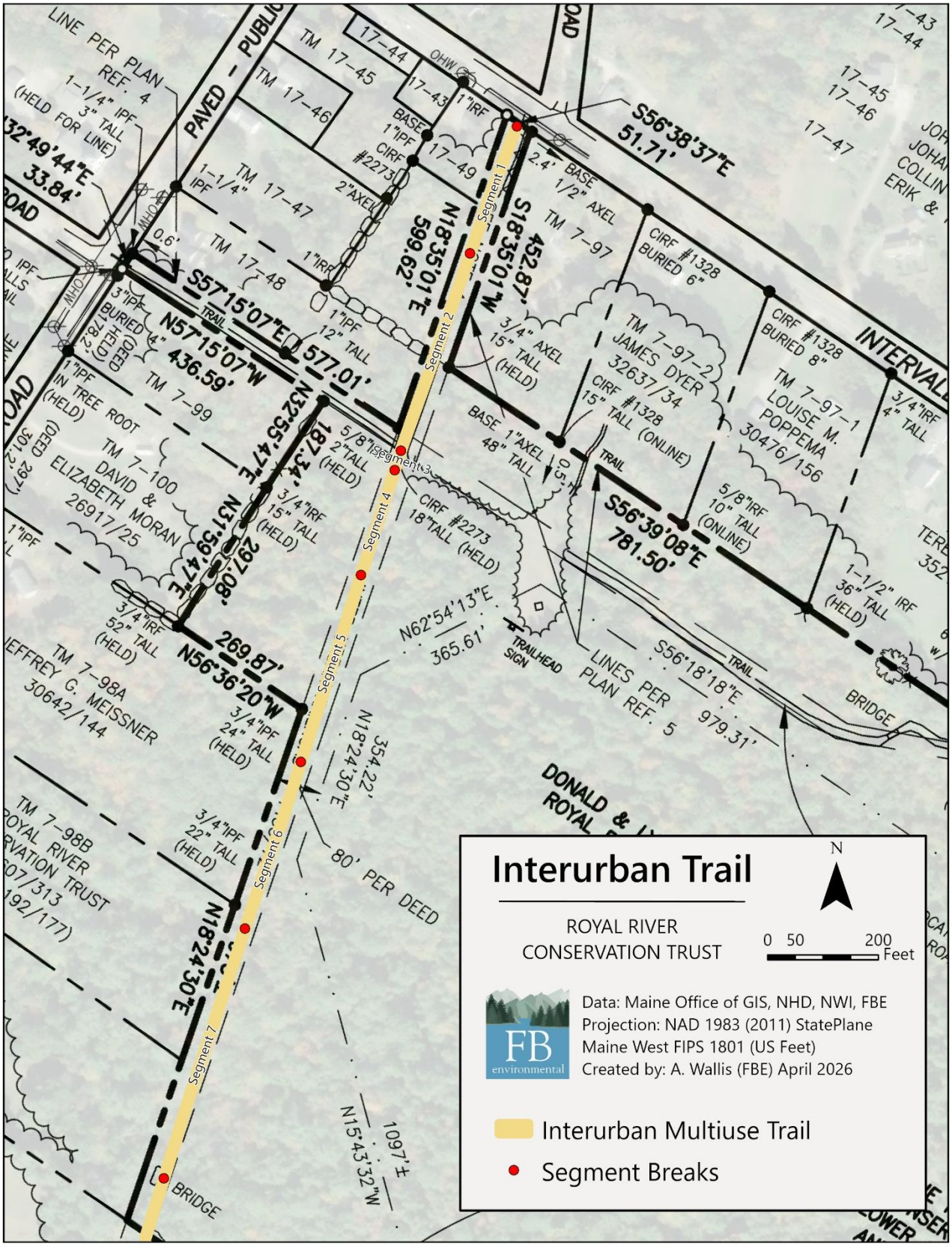


Figure 1. Interurban Trail with proposed work segments overlaid on the 2026 data.

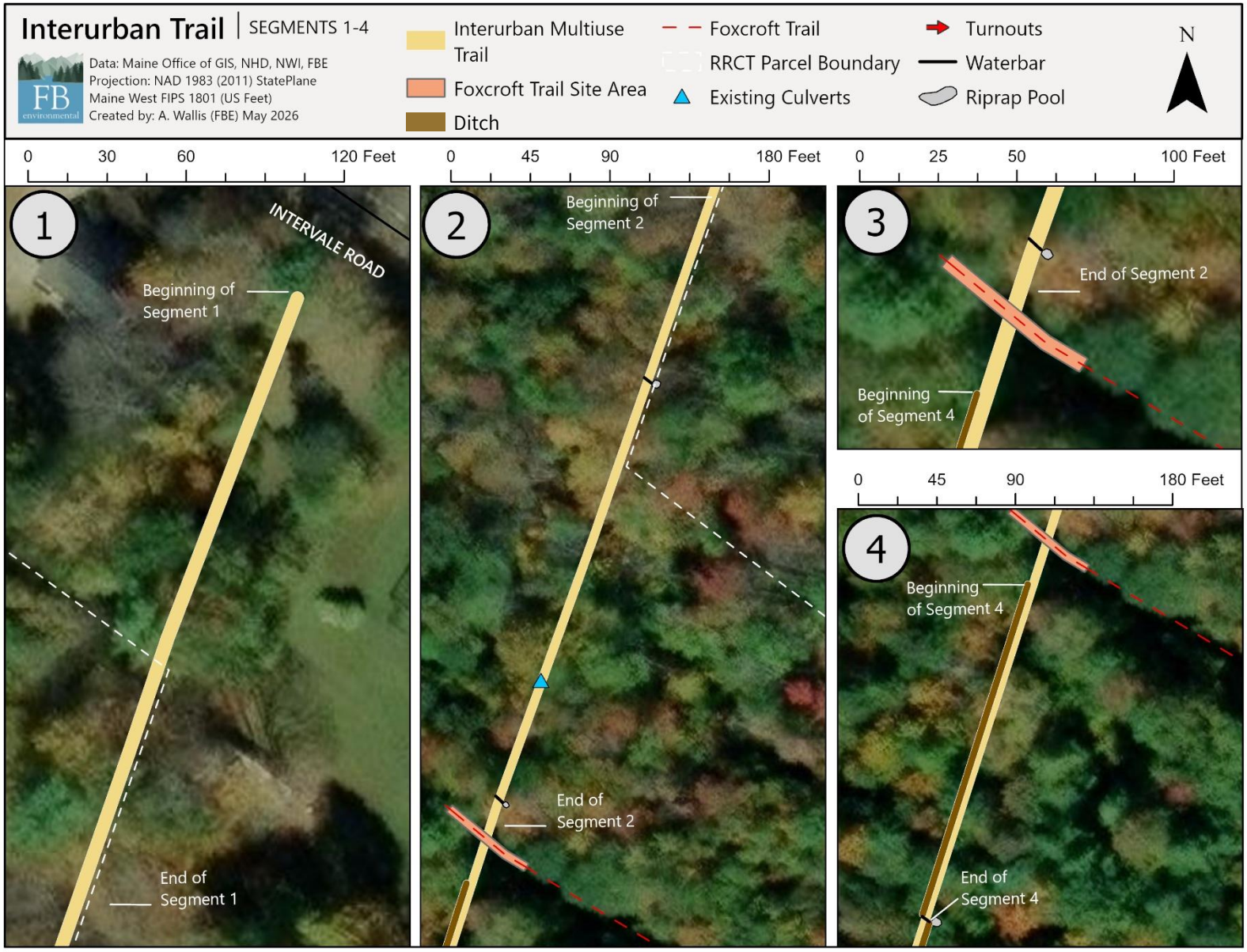


Figure 2. Interurban trail recommendations for segments 1-4.

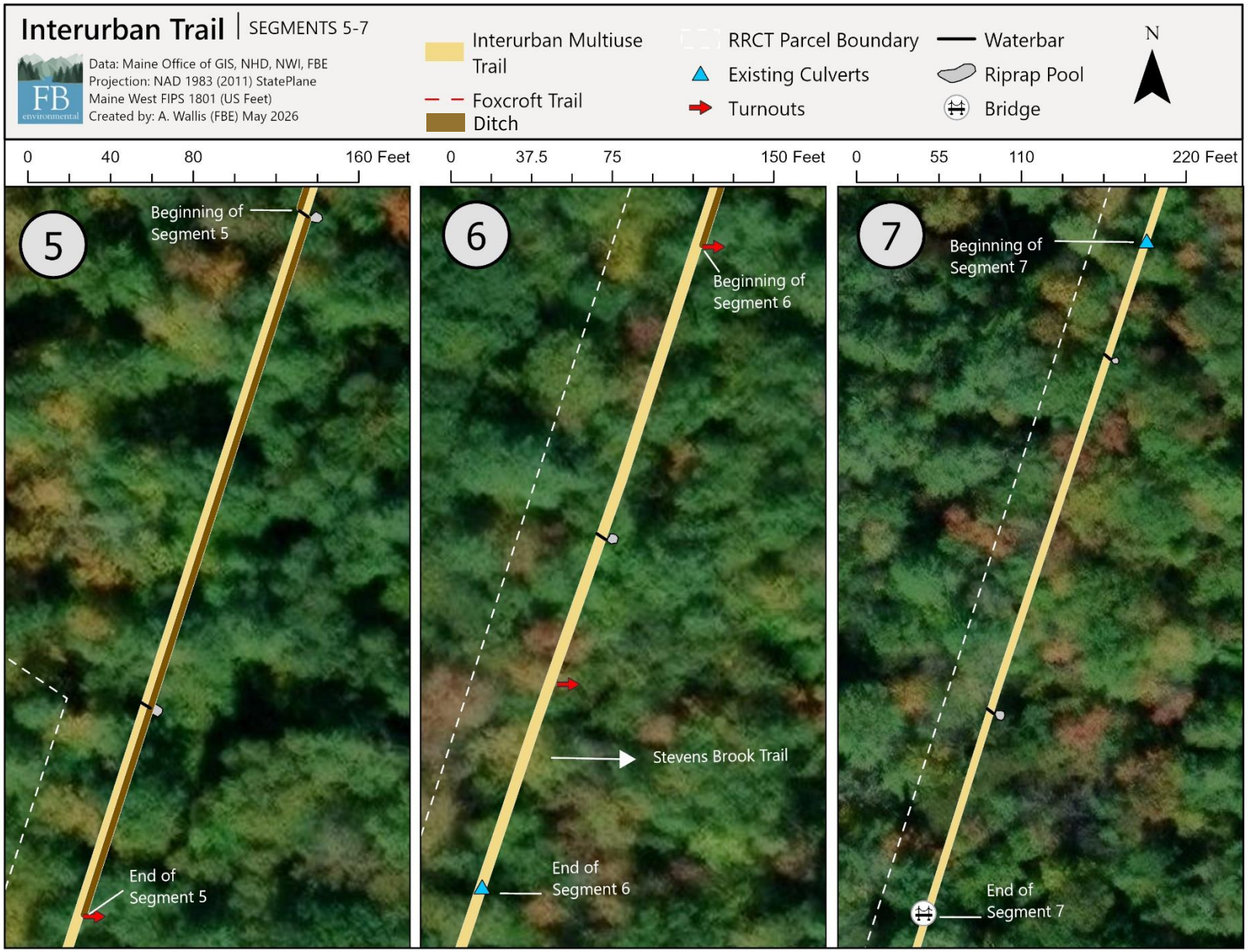


Figure 3. Interurban trail recommendations for segments 5-7.

RECOMMENDED SOLUTIONS

Design sketches for recommended solutions are provided in Attachment 2. Solutions for the trail will be broken down into seven segments to represent the varying conditions along the trail. All new material added to the trail should be compacted to provide a firm surface and mitigate erosion risk.

Segment 1 – Intervale Road to end of first wet spot (~260')

Clear existing organic material and leaf litter, smooth surface, and add gravel to entire segment to rebuild the surface to a 5' trail width. Along the ~130' wet area, add a geotextile fabric liner layered with crushed rock and gravel overtop to promote better drainage. The trail should be slightly crowned to promote sheeting of water to either side. Add one waterbar or broad-based dip within the wet section per the appropriate Installation Instruction section below. Work should begin as close as possible to the edge of Intervale Road, where corner pins mark the property boundary.

Segment 2 – End of Segment 1 to intersection with the Foxcroft Multiuse Trail (~290')

Clear existing organic material and leaf litter, smooth surface, and add gravel to the entire segment to rebuild the surface to a 5' trail width. Remove downslope (eastern) earthen berm and use the material to build up the trail surface along with fresh gravel layered on top. Some extra material will be required near the trail intersection to fill in existing gully. The trail should be slightly crowned to promote sheeting of water to either side. Add one waterbar or broad-based dip per the appropriate Installation Instruction section below.

Segment 3 – Intersection of Interurban Multiuse Trail and Foxcroft Multiuse Trail

Continue the new gravel surface across the intersection. The focus of this project is on the Interurban Trail, but to assist with transitions at trail intersections, approximately 20' of gravel path should be constructed on the Foxcroft Multiuse Trail on either side of the Interurban Trail crossing. The ends of the gravel areas should taper to match the existing grade and provide a smooth transition to the Foxcroft Multiuse Trail. All trails should be slightly crowned to promote water sheeting.

Segment 4 – Intersection to Cross Ditch Waterbar (~200')

An existing ditch is located in this segment. The accumulated organic debris should be cleared from the ditch so that it can again hold water and function as it was intended. The trail should be resurfaced with gravel to an approximately 5' width, after removing existing organic material and smoothing surface. The trail should be slightly crowned to promote water sheeting on either side. There is a wet section of the trail near the intersection with the Foxcroft Multiuse Trail; two bog bridges are currently in place. Remove these bridges and add a geotextile lining and crushed rock underlayer to promote drainage through the wet segment. At the southern end of the segment where the existing ditch ends, add a waterbar across the trail to divert flow from the ditch and trail into the adjacent wooded area. The waterbar should be approximately 17' long and installed as described in the Waterbar Installation Instructions below. The extra waterbar length is necessary to carry water from the ditch adjacent to the trail into the forested area on the opposite side of the trail.

Segment 5 – Cross Ditch Waterbar to Turnout (~355')

The existing earthen berms along the side of the trail are very high in this section, with a greater frequency of large rocks and wet soils within the trail due to lack of drainage and erosion. A new ditch should be created on the eastern (downslope) side of the trail. The ditch should be approximately 18-24" wide and

12″ deep, with gently sloping sides that are stabilized with shade-tolerant native grass seed or riprap. Existing organic material buildup should be removed from the trail. Wet sections of the trail should be lined with geotextile fabric, with a layer of crushed 3/4″ stone and gravel overtop to a width of approximately 5′. The trail should be slightly sloped to the east to promote water drainage into the new ditch. Add waterbars or broad-based dips along the trail approximately every 250′, installed as described in the appropriate Installation Instruction section below. At the southern end of the section, create a turnout from the ditch into the woods. The turnout should be lined with riprap for stabilization.

Segment 6 – Turnout to Old Culvert (~315′)

Clear existing organic material and leaf litter, smooth surface, and add gravel to entire segment to rebuild the surface to a 5′ trail width. The trail should be slightly crowned to allow water to flow to either side. There are some existing eroded gullies in this section that will require additional fill to create a smooth trail surface. Add waterbars or broad-based dips along the trail approximately every 250′, installed as described in the appropriate Installation Instruction section below.

Segment 7 – Old Culvert to Footbridge (470′)

Clear existing organic material and leaf litter, smooth surface, and add gravel to entire segment to rebuild the surface to a 5′ trail width. The trail should be slightly crowned to allow water to flow to either side. Add waterbars or broad-based dips along the trail approximately every 250′, installed as described in the appropriate Installation Instruction section below. This section is the lowest priority, and could be dropped or reduced in scale if additional funding is needed on other sections of the trail.

WATERBAR INSTALLATION INSTRUCTIONS

The waterbars should be constructed of 6-8″ pressure-treated ground-rated. They should be installed at a 30° angle to the trail. In front of the uphill edge of the waterbar, create a 12″ wide, 6″ deep trench that is lined with non-woven geotextile fabric and filled with ¾″ crushed stone. The timber should be reinforced by 18″ rebar for additional security. A small depression filled with stone (referred to as riprap pools in Figures 2 and 3) should be constructed at the outlet of each waterbar to dissipate water velocity before it disperses into the adjacent forest. These should be approximately 12-18″ in diameter and depth. Depth may be shallower based on site conditions. Installation should follow the guidelines in the Maine Conservation Fact Sheets for Homeowners on Runoff Diverters (Attachment 3). The waterbars should extend across the entire trail, and slightly past it into the forested buffer.

BROAD-BASED DIP INSTALLATION INSTRUCTIONS

Broad-based dips may be used in place of waterbars where ongoing maintenance will not be a frequent concern. Create a gradual depression in the trail followed by a small berm on the downhill side. The distance between the top of the berm and the bottom of the depression should be 20′. A small depression filled with stone (riprap pool) should be constructed at the outlet of each dip to dissipate water velocity before it disperses into the adjacent forest. These should be approximately 12-18″ in diameter and depth. Depth may be shallower based on site conditions. Installation should follow the guidelines in the Maine Conservation Fact Sheets for Homeowners on Runoff Diverters (Attachment 3).

Required Permits

It is not anticipated that this project will require any permits. Activities are located at least 75 feet from any regulated natural resources. Additionally, the project area is located entirely within the Rural Residential district of New Gloucester. Per communication with the New Gloucester Code Enforcement Officer (CEO), a permit may be required based on the amount of material being brought to the site. The contractor should coordinate with the CEO after final material estimates have been completed. If the CEO determines no permit is required, notification of construction dates should still be provided to the CEO.

IMPORTANT NOTE: Please call DigSafe (811) at least 72 business hours before any digging begins. They will visit the property to mark the specific location of underground utilities to avoid.

Erosion and Sedimentation Control

The contractor must provide suitable erosion and sedimentation controls during construction as required by Maine's Erosion and Sediment Control Law. The preferred erosion and sedimentation control for this site is an erosion control mulch berm at least 12" high and 24" wide, installed along the downslope edge of work. Acceptable alternatives include a silt fence or erosion control socks. Controls must be in place prior to the start of construction activities. Please note that these recommendations are not intended for winter construction; additional controls or density may be required if construction occurs in winter months (defined as October 15 – May 1).

Materials and Costs

An initial list of materials necessary to construct the trail improvements as described is provided below. These estimates should be considered preliminary and are to be refined by the contractor. It is expected that the contractor will lead purchasing and coordination of delivery of the materials needed for the project.

- ¾" gravel, approximately 90 cubic yards (70 yards without Segment 7)
- Non-woven geotextile fabric, approximately 400-450 feet
- ¾" crushed stone, approximately 20-30 cubic yards
- 6"x6" pressure-treated ground-rated lumber for seven waterbars
- ½" rebar (18" length), 14 pieces for seven waterbars
- Shade-tolerant grass seed, enough to cover approximately 710 square feet of new ditch
- Erosion control mulch sufficient to provide erosion and sedimentation control berms to cover approximately 1,979 linear feet of work zone.

Work at this site will be funded by grant funding awarded to the Royal River Conservation Trust through the Maine Trails Program. Costs for improvements at this site should not exceed:

- Contracted Labor $12,000
- Materials $5,446.22

ATTACHMENT 1: SITE PHOTOS

Photo 1. Wet section of trail in Segment 1. Intervale Road is located in the background of the photo.

Photo 2. Erosion on the Interurban Trail at the end of Segment 2, adjacent to the intersection with the Foxcroft Multiuse Trail.

Photo 3. Interurban Trail where it intersects with the Foxcroft Multiuse Trail (Segment 3).

Photo 4. Wet section of trail at the beginning of Segment 4, just past the intersection of the Interurban Trail with the Foxcroft Multiuse Trail.

Photo 5. Trail Segment 4, with the existing ditch located along the left side of the photo.

Photo 6. Segment 5, depicting the high berms on either side of the trail, with wet trail conditions down the middle.

Photo 7. Proposed turnout location between Segments 5 and 6.

Photo 8. Trail conditions in Segments 6 and 7 are generally dry, with some existing gullies that require repair.

ATTACHMENT 2: DESIGN SKETCHES

Contractor input will be welcome on design details, such as depth of gravel needed for trail resurfacing and other recommended materials. Waterbars may be replaced with broad-based dips where appropriate. An example is shown in Figure 5.

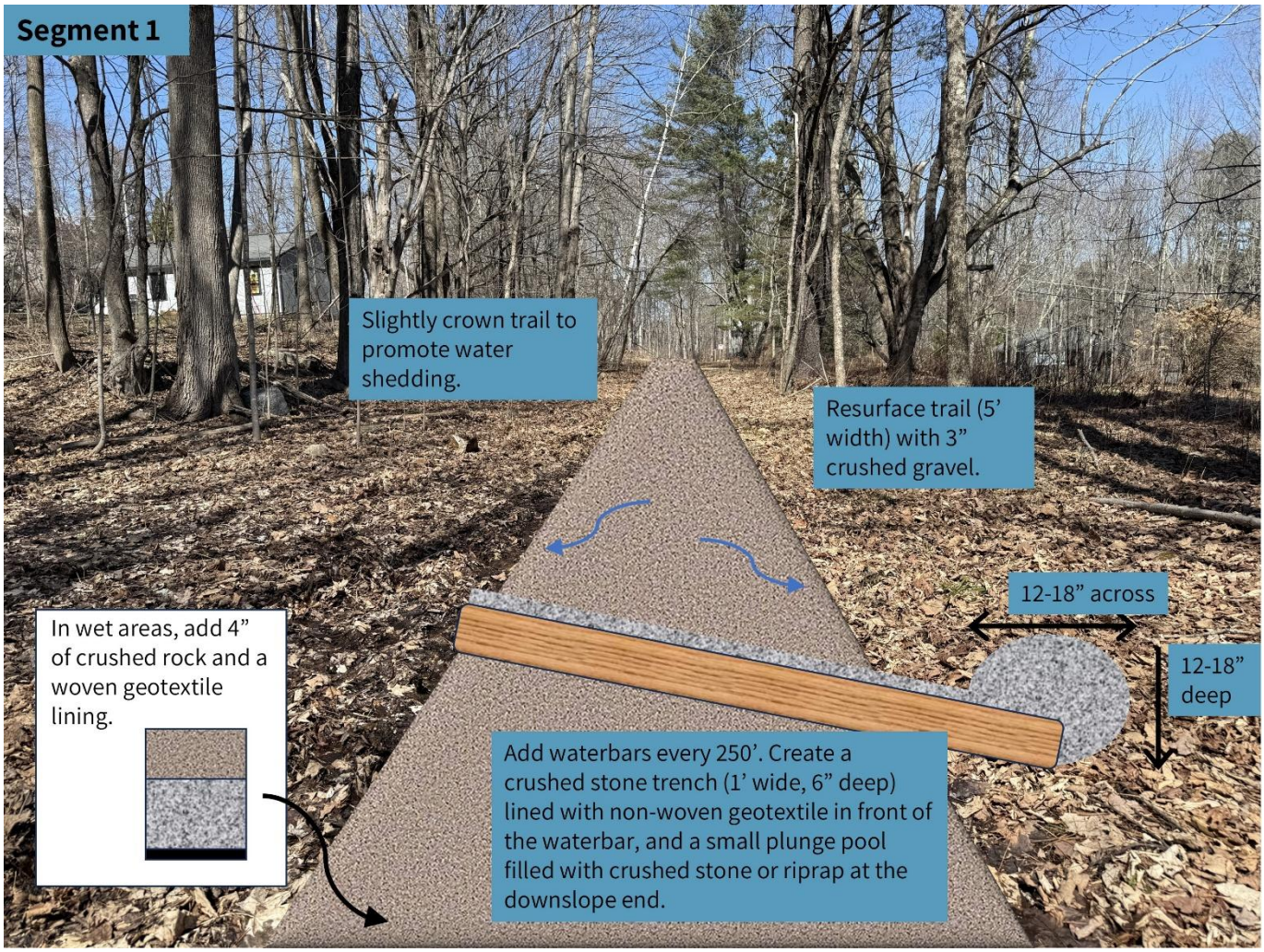


Figure 4. Proposed trail improvements for Segment 1.

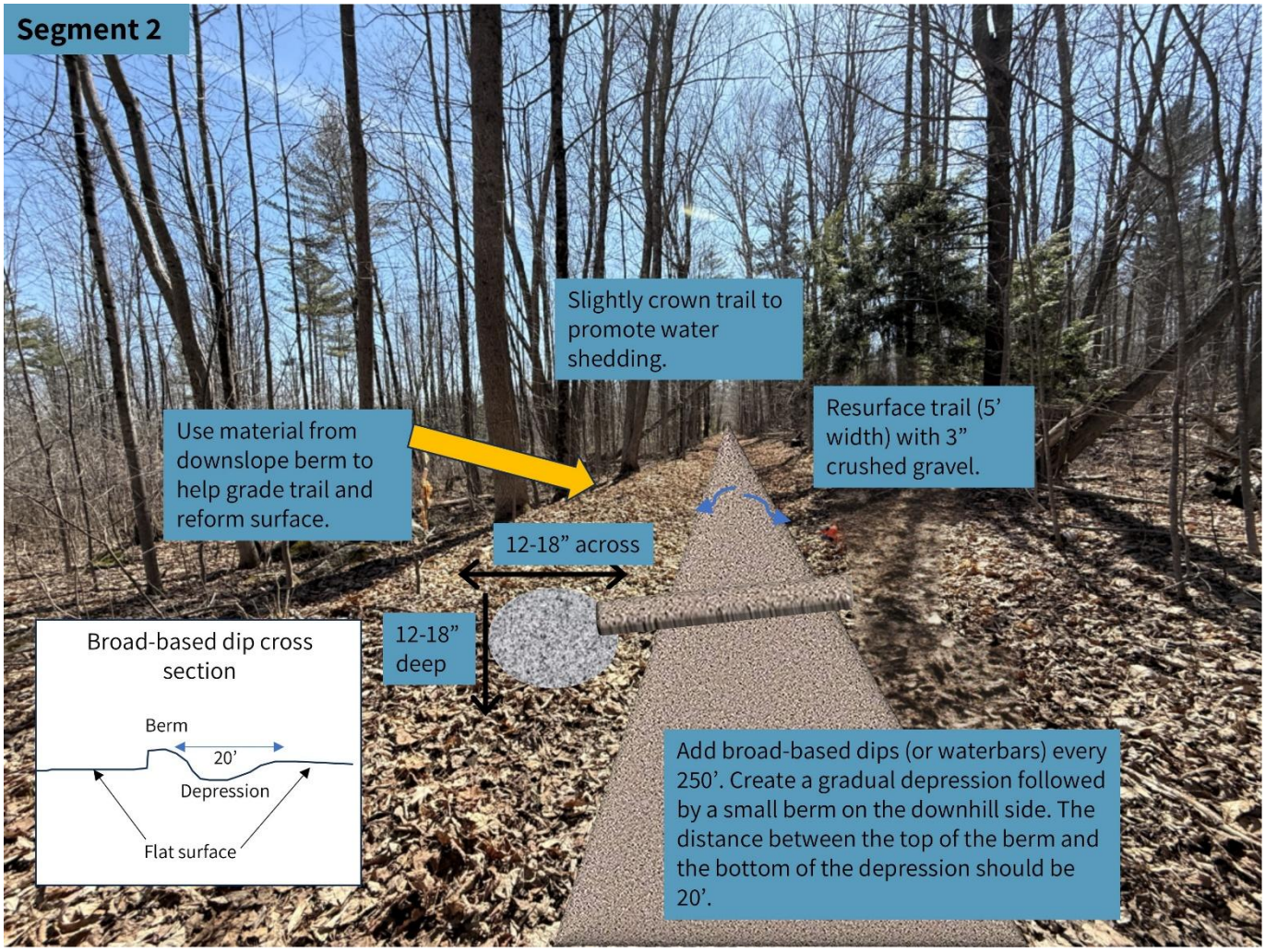


Figure 5. Proposed trail improvements for Segment 2.

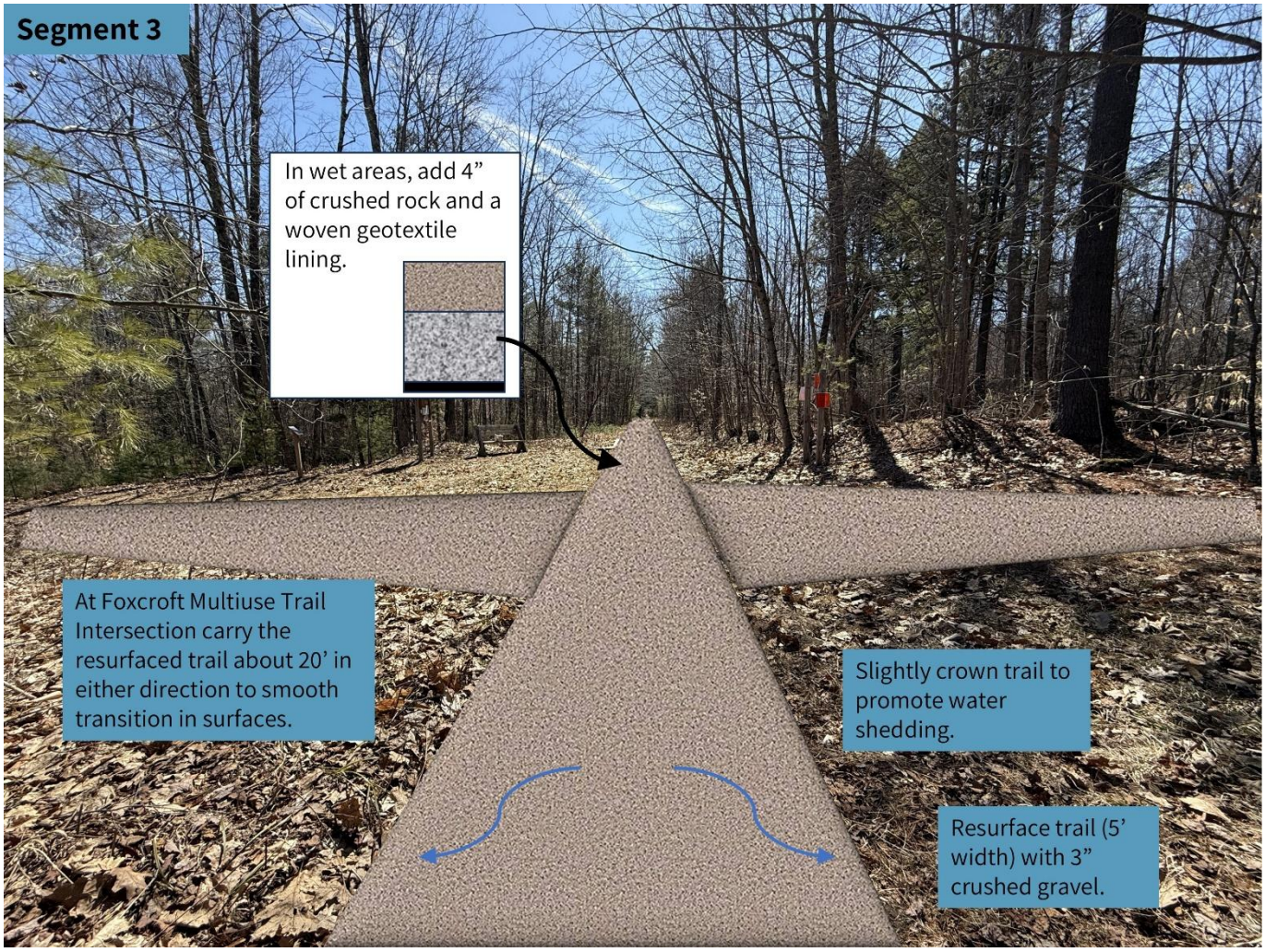


Figure 6. Proposed trail improvements for Segment 3.

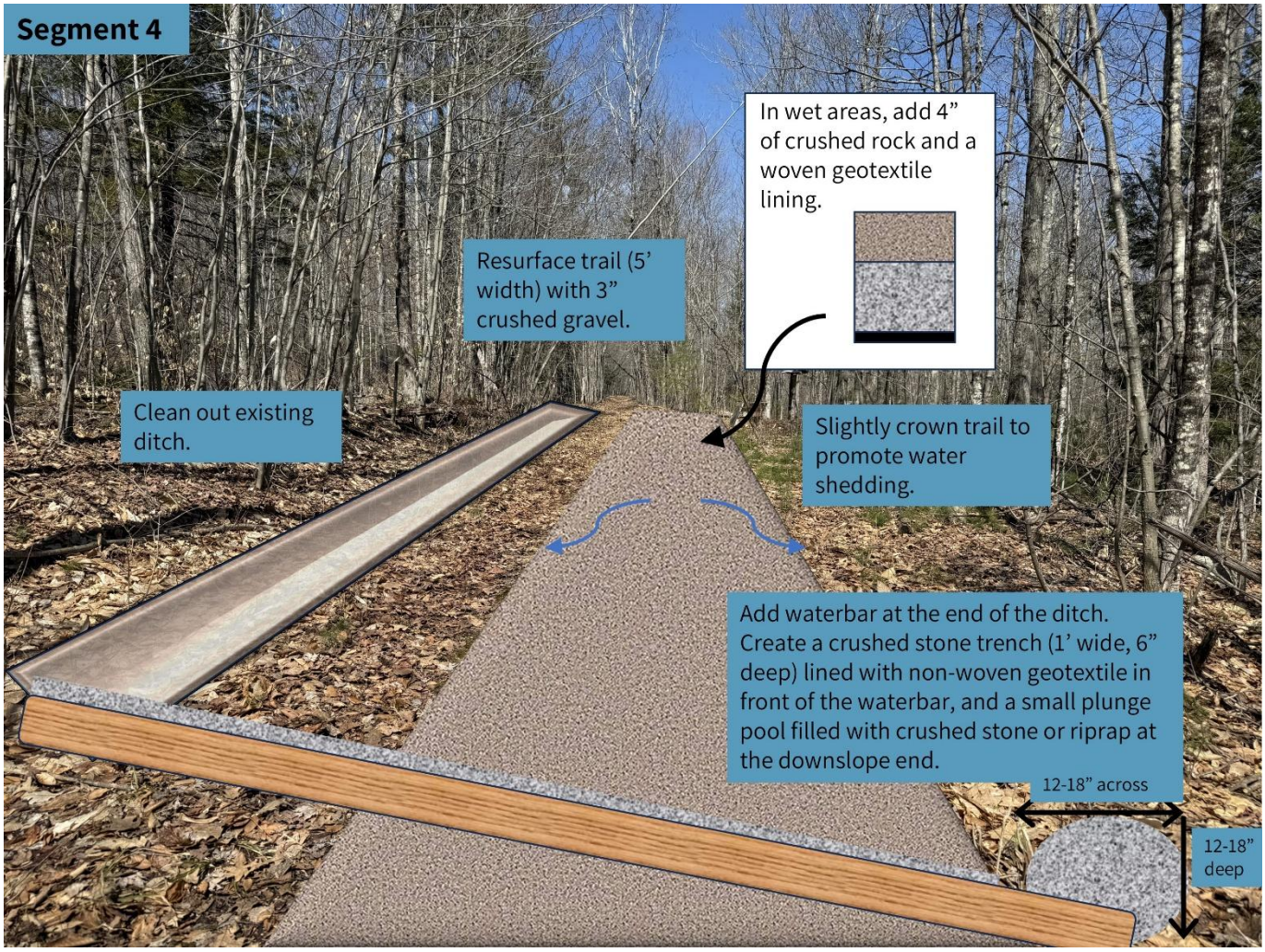


Figure 7. Proposed trail improvements for Segment 4.

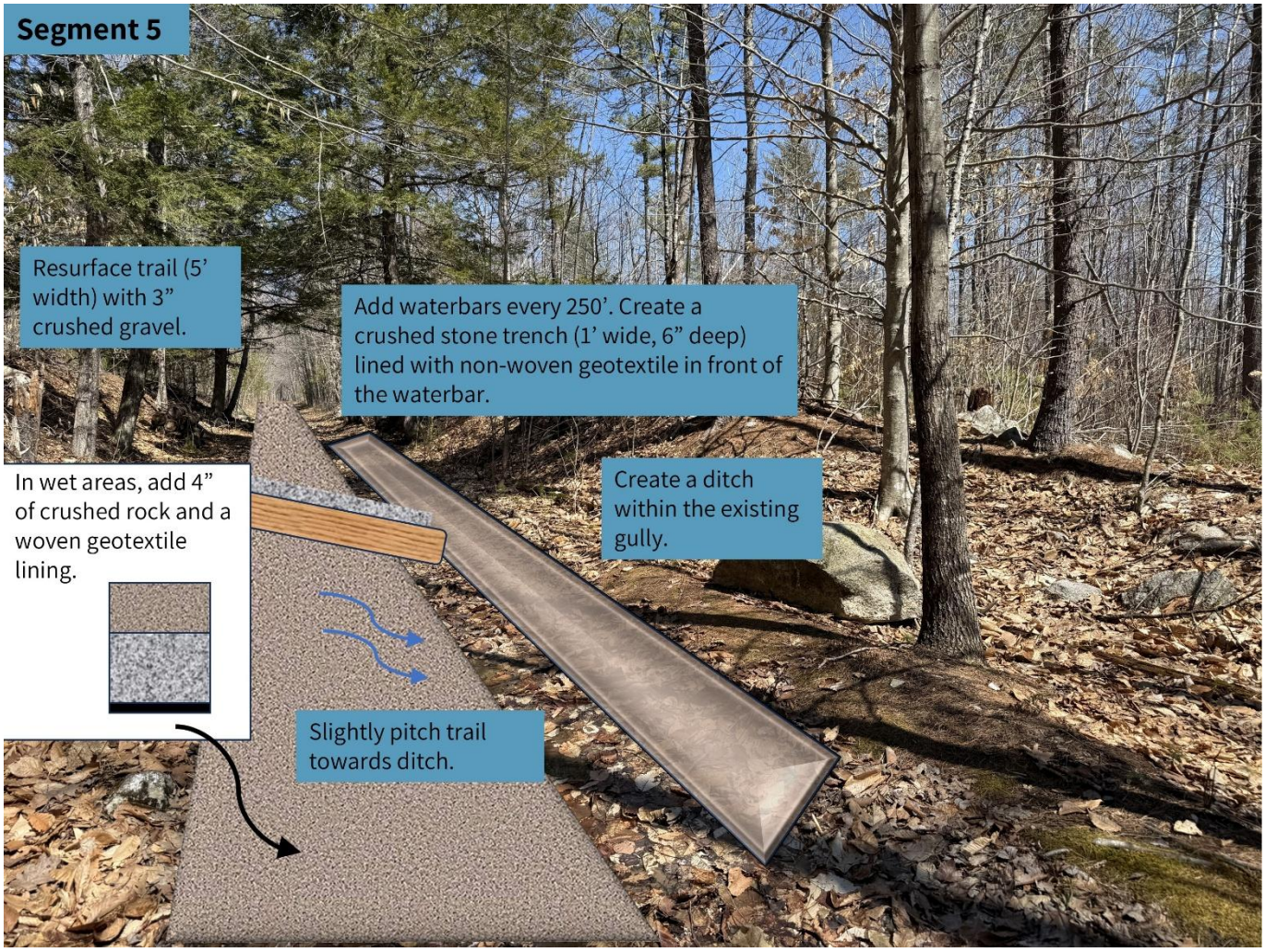


Figure 8. Proposed trail improvements for Segment 5.

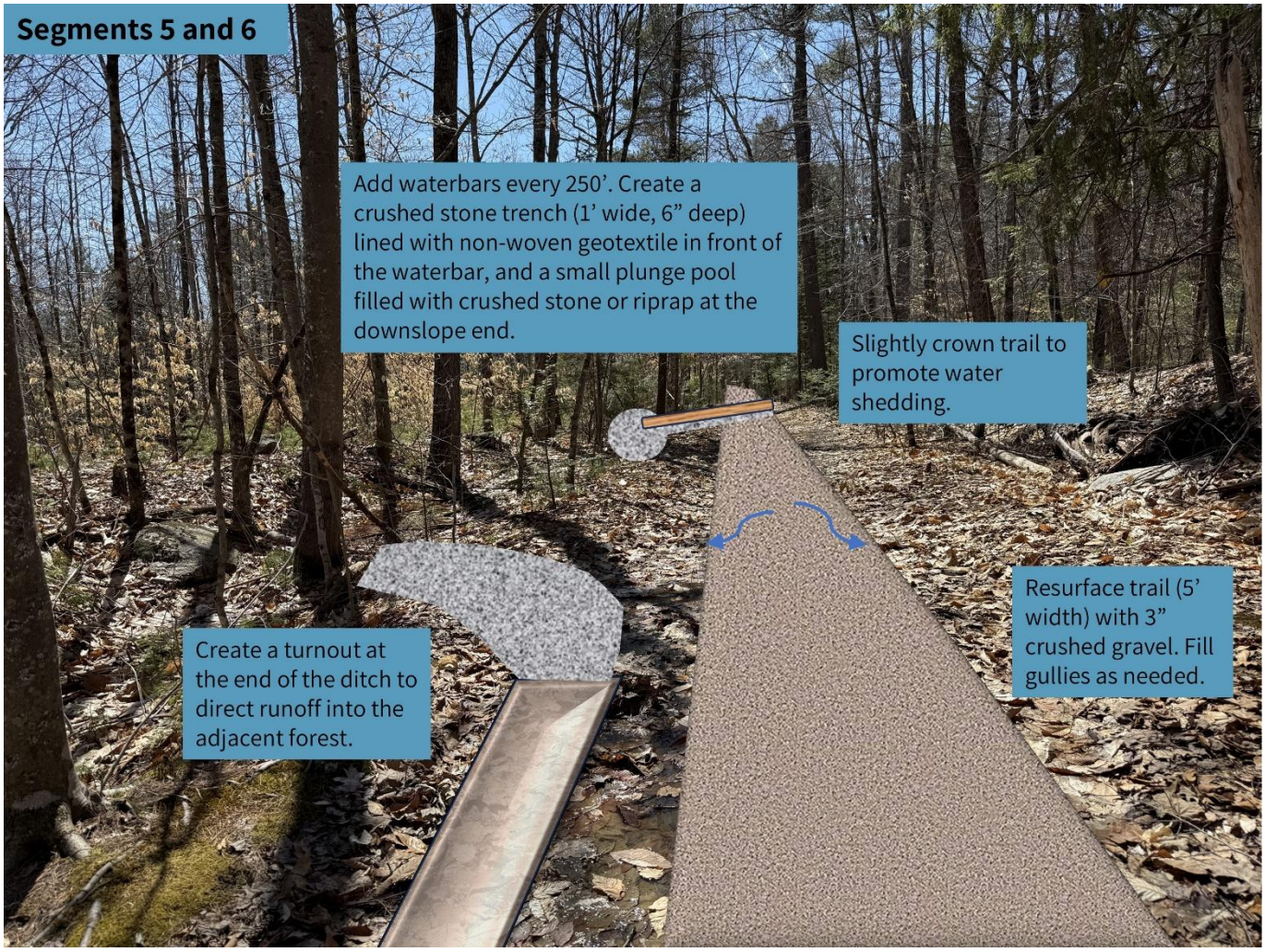


Figure 9. Proposed trail improvements for Segments 5 and 6.

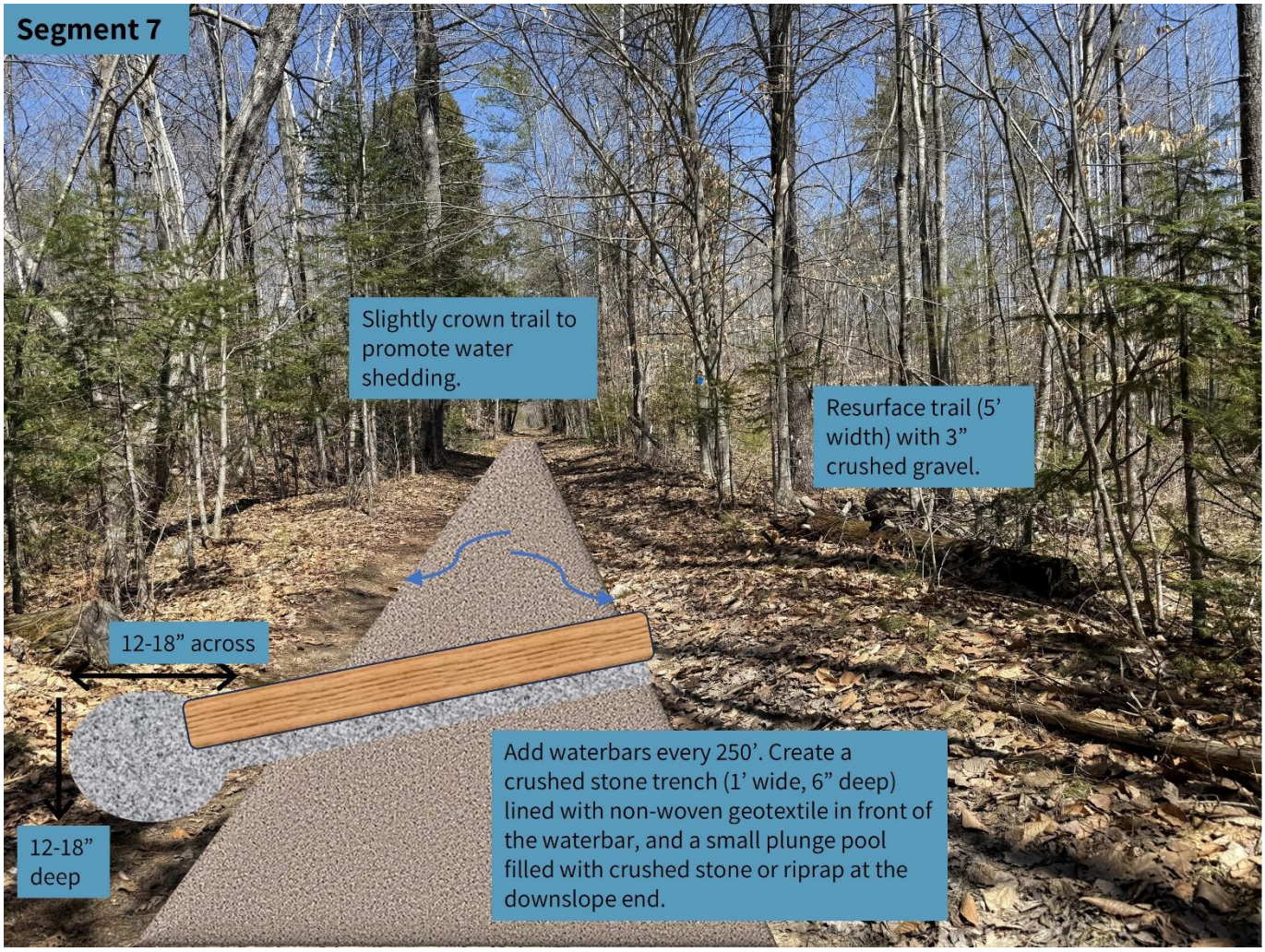
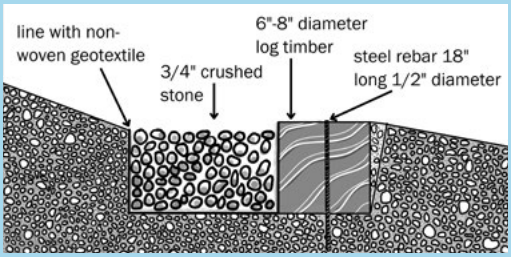


Figure 10. Proposed trail improvements for Segment 7.

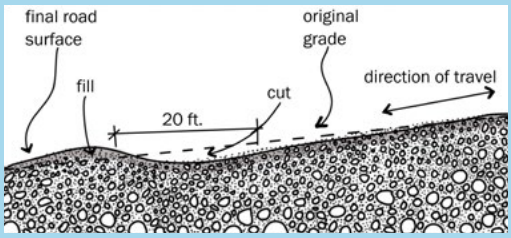
ATTACHMENT 3: WATER DIVERTER FACT SHEET

Maine Conservation Fact Sheets for Homeowners Series

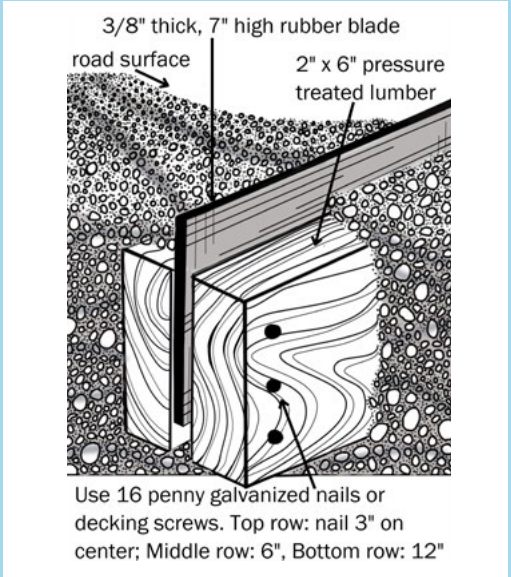
Runoff Diverters



Waterbars - these diverters work best on trails or pathways.



Broad-Based Dips - an easy way to divert water with minimal tools, but needs to be maintained regularly to remain effective.



Rubber Razors - if using on a plowed road, make sure rubber razor is well marked and plow driver lifts blade to avoid damage.

Scan Here for a video of Rubber Razor Installation

Purpose:

Used on slopes to intercept and divert water away from footpaths, trails, camp roads, and driveways into stable vegetated areas. Runoff Diverters include Rubber Razors, Open-Top (Box) Culverts, Waterbars, and Broad-Based Dips.

Installation:

If using on roads or driveways that are plowed in the winter, extra care should be taken to mark their location and notify the plow driver to avoid damage. Broad-based dips are the least likely to be damaged by plowing, but may require re-grading in the spring.

1. Select a location where the diverter outlet can drain to a stable, vegetated area. Install multiple diverters as needed and space closer together on steeper slopes as directed in Table 1.

2. All diverters start with digging an approximately 6” deep x 6-8” wide trench at a 30° angle across the whole road/path. The outlet of the trench should be stabilized with stone to break up water flow.

3. From here, choose the diverter you’d like to use and follow the specific directions below:

Waterbars: Use railroad ties, downed rot-resistant logs, or pressure treated cedar approx. 6-8” in diameter and the length of the trench. Install flush with the trench, then secure with 18” rebar pins 6” from each edge, pounded into place. Dig a 12” wide, 6” deep trench along the uphill edge of the waterbar and backfill with 1/2-3/4” diameter crushed stone. Grade as needed to form a smooth, flush surface.

Table 1. Diverter Spacing

% Grade	Spacing Between Diverters (feet)
2	250
5	135
10	80
15	60
20	45
30	35

Broad-based Dips: This is a simple cut and fill – the trench in this case should be a gradual depression followed by a small hump/speed bump on the downhill side of the trench formed by shaping the cut material into a berm. The distance between the top of the berm and the bottom of the depression should be 20’.

Rubber Razors: Sandwich rubber conveyor belt material (approx. 12” wide and 3/8” thick, and as long as the trench requires) between two 2x6 pieces of pressure treated lumber the same length as the rubber, so that the rubber material is sticking out about 7” above the lumber. Secure with galvanized nails or decking screws. Bury the razor in the trench and compact so that only about 3” of rubber material is sticking out above the ground.

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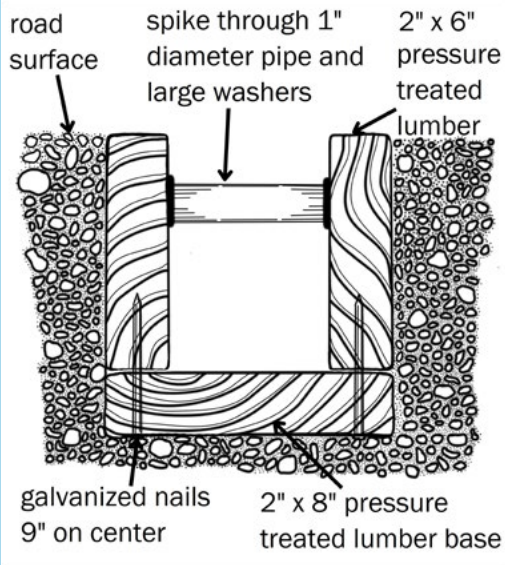

Open-Top Culvert - these structures can be cleaned out with a narrow garden hoe.

Open-Top (Box) Culverts: Open-top culverts are 3-sided wooden boxes placed below road level. They require two trench-lengths of 2x6 lumber for the sides of the box and one trench-length of 2x8 lumber for the bottom of the box. Attach the side pieces to the bottom with 3" galvanized nails. Use spikes, bolts, pipe, or 1" pieces of wood as spacers to maintain the width of the culvert and prevent it from collapsing. The width of the inside of the culvert should be about 3 ½". The structure should be buried in the trench so that it is completely flush with the road/path.

Materials:

Rubber razors are commonly made from used conveyor belts. Contact local rubber suppliers, your county Soil and Water Conservation District, or regional lake association for sources. All other materials can be sourced from hardware stores.

Maintenance:

Diverters should be checked periodically and after storm events to ensure that they are functioning properly, and repaired if necessary. Accumulated leaves and debris should be removed from diverters each spring and fall.

Scan here for more information

EPA

This project was funded, in part, by the United States Environmental Protection Agency

Department of Environmental Protection · State of Maine ·

Portland Water District

From Sebago Lake to Casco Bay