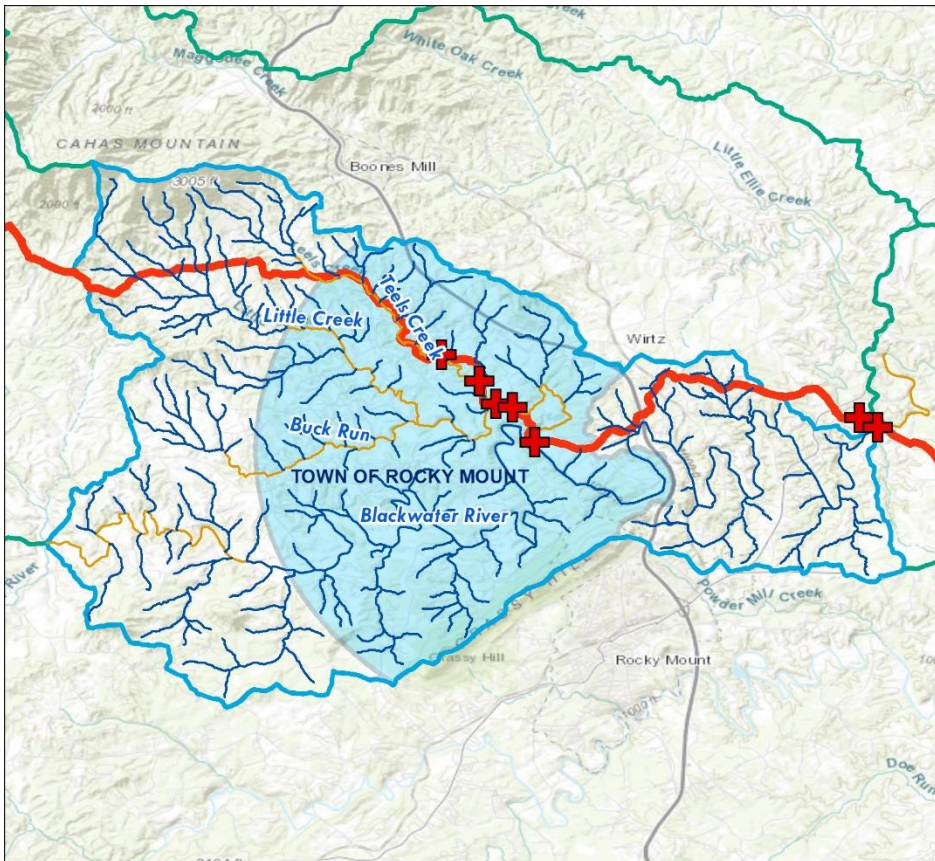


# Impacts of Mountain Valley Pipeline Stream Crossings within the Jurisdiction of the Virginia Marine Resources Commission



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## ABBREVIATIONS

FEIS	Final Environmental Impact Statement
FERC	Federal Energy Regulatory Commission
HDD	horizontal directional drilling
HUC	hydrologic unit code
MVP	Mountain Valley Pipeline
USFWS	U.S. Fish and Wildlife Service
VDCR	Virginia Department of Conservation & Recreation
VDEQ	Virginia Department of Environmental Quality
VDGIF	Virginia Department of Game and Inland Fisheries
VDOH	Virginia Department of Health
VRMC	Virginia Marine Resources Commission

# 1. INTRODUCTION

The Mountain Valley Pipeline (MVP) is proposed to run between Wetzel County, West Virginia and Pittsylvania County, Virginia—a length of approximately 300 miles. If constructed, it would bring up to two million dekatherms per day of firm transmission capacity to markets in the Mid- and South Atlantic regions (MVP, 2017).

As illustrated in Figure 1, the MVP would cross two states: West Virginia and Virginia. The entire length of the pipeline is planned to be “up to 42 inches in diameter and will require approximately 50 feet of permanent easement (with 125 feet of temporary easement during construction)” (MVP, 2017). Water and wetland crossings will be reduced to a 75-foot construction width (VDEQ, 2017).

This report discusses impacts from the MVP on streams impacted by the crossings under the Virginia Marine Resources Commission’s (VMRC’s) jurisdiction. VMRC issues permits for subaqueous activities in streams with a drainage basin of greater than five square miles, or a mean annual flow greater than five cubic feet per second (VMRC, 2005).<sup>1</sup> The MVP is projected to cross 18 streams subject to this jurisdiction and review (Tetra Tech, 2017).

VMRC’s Subaqueous Guidelines point to the Virginia Constitution, which, in Article XI, Section 1 states:

“To the end that the people have clean air, pure water, and the use and enjoyment for recreation of adequate public lands, waters, and other natural resources, it shall be the policy of the Commonwealth to conserve, develop, and utilize its natural resources, its public lands, and its historical sites and buildings. Further, it shall be the Commonwealth's policy to protect its atmosphere, lands, and waters from pollution, impairment, or destruction, for the benefit, enjoyment, and general welfare of the people of the Commonwealth.”

In short, and as it pertains to the issue at hand: to ensure pure water and recreational use of public lands and waters, the Commonwealth’s policy will be to protect its lands and waters from pollution, impairment, or destruction.

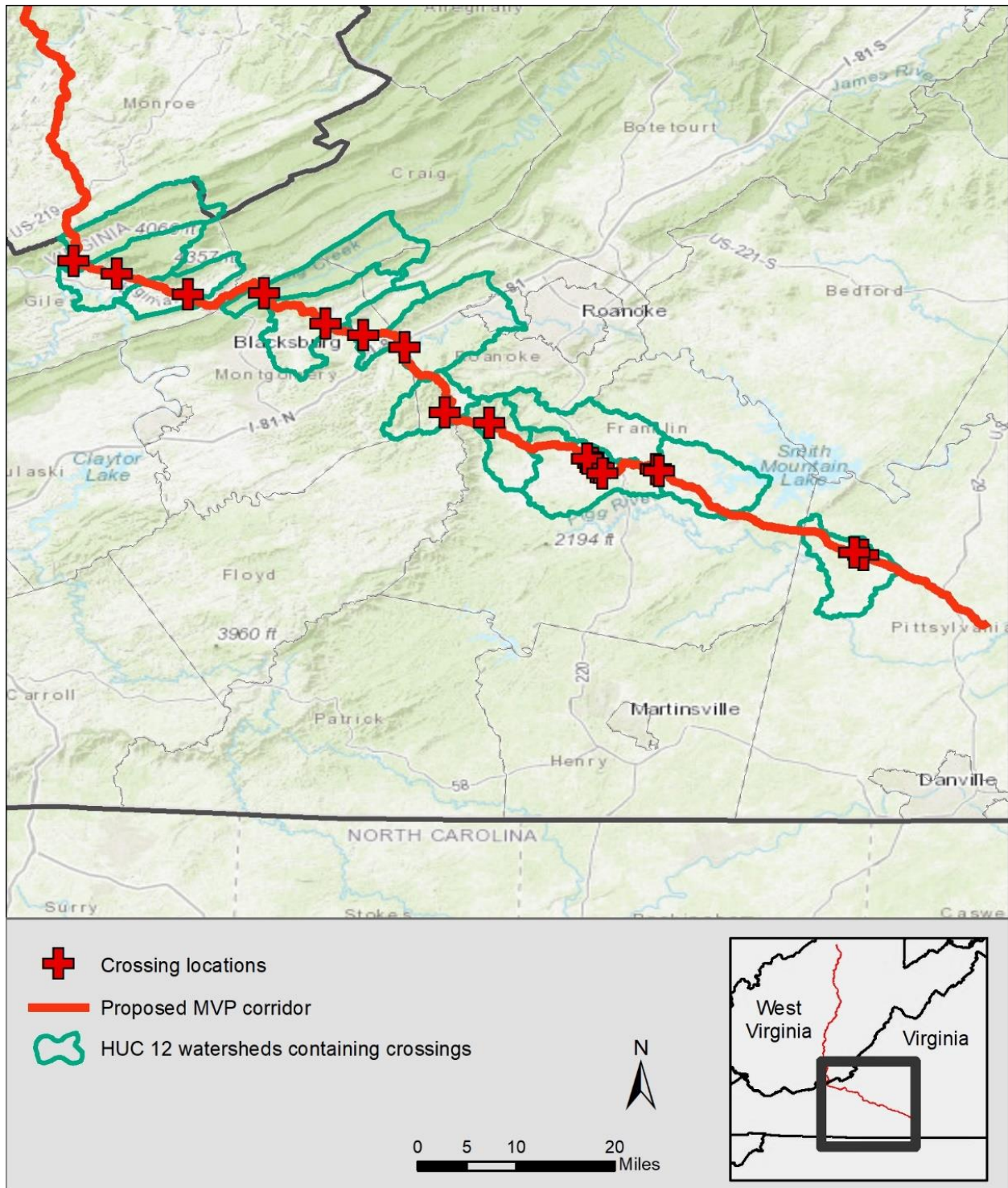
In addition to pointing to the Constitution, VMRC’s Subaqueous Guidelines include additional detail. Section I-C states that: “...permitted encroachments will strive to minimize interference with the rights of all citizens of the Commonwealth to other appropriate uses” (VMRC, 2005) and that the Commission will consider “...the effect of the proposed project upon: other reasonable and permissible uses of State waters and State-owned submerged lands; marine and fisheries resources, wetlands, adjacent or nearby properties; anticipated public and private benefits, submerged aquatic vegetation, and water quality.” (VMRC, 2005)

Additionally, in Section IV, the Guidelines state a preference for horizontal directional drilling (HDD): “In general, directional drill methodologies are preferred over trenching.” (VMRC, 2005)

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<sup>1</sup> See also Code of Virginia, §28.2, Fisheries and Habitat of the Tidal Waters, <https://law.lis.virginia.gov/vacode/title28.2/>.

Figure 1: The Mountain Valley Pipeline route



## 2. GENERAL IMPACTS OF THE MOUNTAIN VALLEY PIPELINE

### 2.1 Sediment

Even when best management practices are used, MVP pipeline and access road construction would cause erosion and sedimentation. This includes stream crossings under VMRC's jurisdiction, other stream and wetland crossings, and upland pipeline and access road construction.

Increased sedimentation and turbidity has real impacts on aquatic life. According to the Federal Energy Regulatory Commission's (FERC's) Final Environmental Impact Statement (FEIS) for the MVP:

“Increased sedimentation and turbidity resulting from in-stream and adjacent construction activities could displace and impact fisheries and aquatic resources. Sedimentation could smother fish eggs and other benthic biota and alter stream bottom characteristics, such as converting sand, gravel, or rock substrate to silt or mud. These habitat alterations could reduce juvenile fish survival, spawning habitat, and benthic community diversity and health. Increased turbidity could also temporarily reduce dissolved oxygen levels in the water column and reduce respiratory functions in-stream biota. Turbid conditions could also reduce the ability for biota to find food sources or avoid prey. The extent of impacts from sedimentation and turbidity would depend on sediment loads, stream flows, stream bank and stream bed composition, sediment particle size, and the duration of the disturbances.... Benthic invertebrates and freshwater mussels could also be affected by elevated turbidity and suspended sediments. Although freshwater mussels in the construction zone would be relocated by qualified biologists and in accordance with both West Virginia and Virginia mussel protocols, downstream sessile species could be affected. Aquatic invertebrates, including insect larvae, would generally be unable to avoid work areas.” (FERC, 2017a, p. 4-216-217)

Sixteen of the 18 stream crossings under VMRC's jurisdiction would use a dry-ditch, open-trench method (Tetra Tech, 2017; VDGIF, 2018a). This crossing method would disrupt fish life and kill benthic macroinvertebrate organisms within the construction corridor of the crossing.

HDD is planned for the Pigg River crossing, and conventional bore is planned for the Stony Creek crossing; however, even for these two crossings, MVP is authorized to use dry-ditch, open-trench methods if drilling is not practicable (VDGIF, 2018a).

Regardless of method utilized and care taken during construction, the disturbance of the streambank and streambed would cause a marked increase in sedimentation and turbidity. These impacts can be long-term and lasting. Initially, there are impacts during the period of initial disturbance and when flow is reestablished over the construction area. In the medium-term, moderate (perhaps intermittent) increases in sedimentation and turbidity would continue from the streambed and stream bank until revegetation occurs in the area immediately adjacent to the construction site. In the long-term, the sediment contribution from upland pipeline corridors could still result in measurable long-term increases in sedimentation and turbidity, dependent upon soil type, slope, and success of revegetation in the upland corridor. Peer-reviewed journal articles have documented short-, medium-, and long-term impacts to benthic macroinvertebrates and fish; one article documented effects that lasted over four years (Lévesque and Dubé, 2007, citing Armitage and Gunn, 1996).

Clingerman and Hansen (2016) estimated the sedimentation impact expected from the MVP. This analysis focused on two West Virginia watersheds: one expected to have a lower risk (Turtletree Fork of Tenmile Creek of West Fork River in Harrison County) and one expected to have a higher risk (an unnamed tributary to Laurel Creek of the Little Kanawha River in Braxton County) of sedimentation from pipeline construction. For each scenario—pre-construction, during-construction, and post-construction—sedimentation loads were estimated. During-construction sedimentation was estimated to increase by 42% and 1,536%, respectively.

Clingerman and Hansen (2017) also estimated the sedimentation impact expected from Atlantic Coast Pipeline crossings in mountainous watersheds in West Virginia and Virginia, which were expected to have a high risk of sedimentation from pipeline construction. The crossings include Turkeypen Creek of Kincheloe Creek in Harrison and Lewis counties, West Virginia and Falls Run of Dutch Creek in the James River watershed in Nelson County, Virginia. For each scenario assessed—pre-construction, during-construction, and post-construction—sedimentation loads were estimated. During-construction sedimentation was estimated to increase by 805% in West Virginia and 9,051% in Virginia.

MVP’s FEIS includes a hydrologic analysis of sedimentation of pipeline construction in parts of West Virginia and Virginia (Environmental Solutions & Innovations, 2017). This analysis confirms that pipeline construction causes erosion and sedimentation:

- “...catchments within these subwatersheds are expected to experience increases in sediment yield over baseline conditions during construction, restoration, and operation with the highest expected increases occurring during the construction timeframe for most waterbodies (Environmental Solutions & Innovations, 2017, p. 24).”
- “Sediment loss from the proposed action will likely be transported into downstream waterbodies; however, predicted total sediment loads demonstrate that these impacts will largely be confined to tributary systems and not larger order rivers... (Environmental Solutions & Innovations, 2017, p. 24).”
- “For most waterbodies studied in this analysis, expected impacts to streams are greatest during the active construction phase of the Project (Environmental Solutions & Innovations, 2017, p. 25).”
- “Based on this analysis, it is expected that sediment loads and yields will reach a new sediment equilibrium approximately four to five years from the start of the Project (Environmental Solutions & Innovations, 2017, p. 25).” This new equilibrium will increase sediment loads from less than one percent to more than ten percent over baseline, depending on the watershed.

FERC’s FEIS for the Atlantic Coast Pipeline summarizes findings related to increased sedimentation in certain watersheds:

“The [U.S. Forest Service] requested that Atlantic prepare a Soil Erosion and Sedimentation Model Report assessing the extent of sedimentation that could occur within priority subwatersheds within the [Monongahela National Forest] and [George Washington National Forest] during construction. Generally, the model results indicate a substantial increase in soil loss relative to baseline rates for the first year of construction. Soil rates are predicted to be higher where there are steeper slopes and higher soil erodibility values. The model results indicate a decline in soil erosion with time as the construction workspace is restored and becomes revegetated. Although according to the model, the predicted soil erosion rates returned to baseline by the third year, some of the model results were skewed to present a best case scenario, and likely underestimate short-term and long-term sediment loads.” (FERC, 2017b, p. 4-231)

## 2.2 Important aquatic species

The MVP route across Virginia crosses spawning areas for many types of fish, including important trout spawning areas. In Virginia, there is one native species of trout: the brook trout. Brook trout live and reproduce in only the cleanest, cold streams. Typically, in Virginia, these streams are small, have good forest canopy, and are found in higher elevations or in association with springs.

Rainbow and brown trout have also been introduced to many streams within Virginia. In some of the best streams, even brown and rainbow trout reproduce and survive without supplemental stockings. Wild trout streams containing any of the three trout species are highly regarded among anglers and conservationists, as they represent a nearly pristine aquatic environment.

The Virginia Department of Game and Inland Fisheries (VDGIF) has requested strict adherence to time-of-year restrictions, which are periods in which no instream work is permissible (VDGIF, 2018a). While these restrictions are important for the protection of aquatic species such as trout, they cannot ensure the complete elimination of impacts to fish and aquatic species. Even when utilizing time-of-year restrictions, muddy water will still cause decreased feeding and increased stress in some fish, including trout. And sedimentation may still impact downstream fish, mussels, and benthic macroinvertebrates.

### **2.3 Drinking water supply intakes**

Drinking water providers rely on clean source water in rivers and streams to produce clean drinking water at the tap. The MVP will cause additional sedimentation and turbidity, which complicates drinking water treatment. In addition, should a spill of fuel or other pollutants occur upstream from an intake, it may flow downstream quickly. For example, a diesel fuel spill occurred at an equipment staging area for a contractor grading and seeding the right-of-way for a natural gas pipeline in Virginia. This spill contaminated the drinking water for a community in nearby Monroe County, West Virginia (Adams, 2015).

According to FERC's FEIS for MVP, there are no "Source Water Protection Areas for Public Surface Water Supplies" within 0.25 mile of the route (FERC, 2017a). However, public drinking water intakes are located downstream and in close proximity to the MVP. The MVP crosses two "Source Water Assessment Areas:" (1) Western Virginia Water Authority-Spring Hollow and (2) Town of Rocky Mount-Blackwater River. These areas are not regulatory boundaries, but they include the area from which pollution can reach intakes quickly, and in which additional scrutiny of potential contaminant sources should be undertaken to protect drinking water sources. Seven crossings under VMRC jurisdiction are located within these two areas (VDOH, 2018).

The 0.25-mile distance from drinking water intakes utilized in FERC's analysis to determine risks to sources of drinking water is dangerously small and should not be relied upon to protect drinking water sources, because pollution from a further distance can still impact the intake. For example, a spill from a facility approximately one mile upstream from Charleston, West Virginia's drinking water intake contaminated water for 300,000 residents in 2014 (Watkins and Ellis, 2014). The Roanoke River is crossed by the proposed MVP route only 1.1 miles upstream of the likely intake location for Western Virginia Water Authority (See Figure 8, below).<sup>2</sup>

### **2.4 Recreation**

Because public use and enjoyment of public lands and waters are referenced in VMRC's Subaqueous Guidelines, the recreational impacts of the MVP must be considered. Sediment and turbidity produced by open-trench stream crossings may impact fishing, boating, and swimming opportunities accessible from nearby stream access points. A total of 14 recreational access points were found to be in close proximity to eight VMRC-regulated stream crossings.<sup>3</sup>

### **2.5 Wetlands**

Where the MVP crosses wetlands, it may impact the same rivers and streams impacted by VMRC-regulated stream crossings. Riparian, riverine wetlands will be impacted at each of the MVP's open-trench crossings subject to VMRC regulation. Several of these crossings will also impact larger, forest/shrub wetlands adjacent to Little Creek, Harpen Creek, Mill Creek, and Teels Creek. Figure 3 shows the wetland area to be impacted by MVP at Harpen Creek.

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<sup>2</sup> This and other distances in this report are measured to the likely intake locations based on the shapes of the source water protection areas. Precise intake locations are not public information.

<sup>3</sup> Stream access point data was compiled from American Whitewater Association, VDGIF, Kayak411.com, and SwimmingHoles.info. Kayak411.com and SwimmingHole.info are now defunct. Points were collected from these websites in 2012. A total of three points from these defunct sites were referenced in this report.



Figure 2: Source water assessment areas in watersheds crossed by the Mountain Valley Pipeline

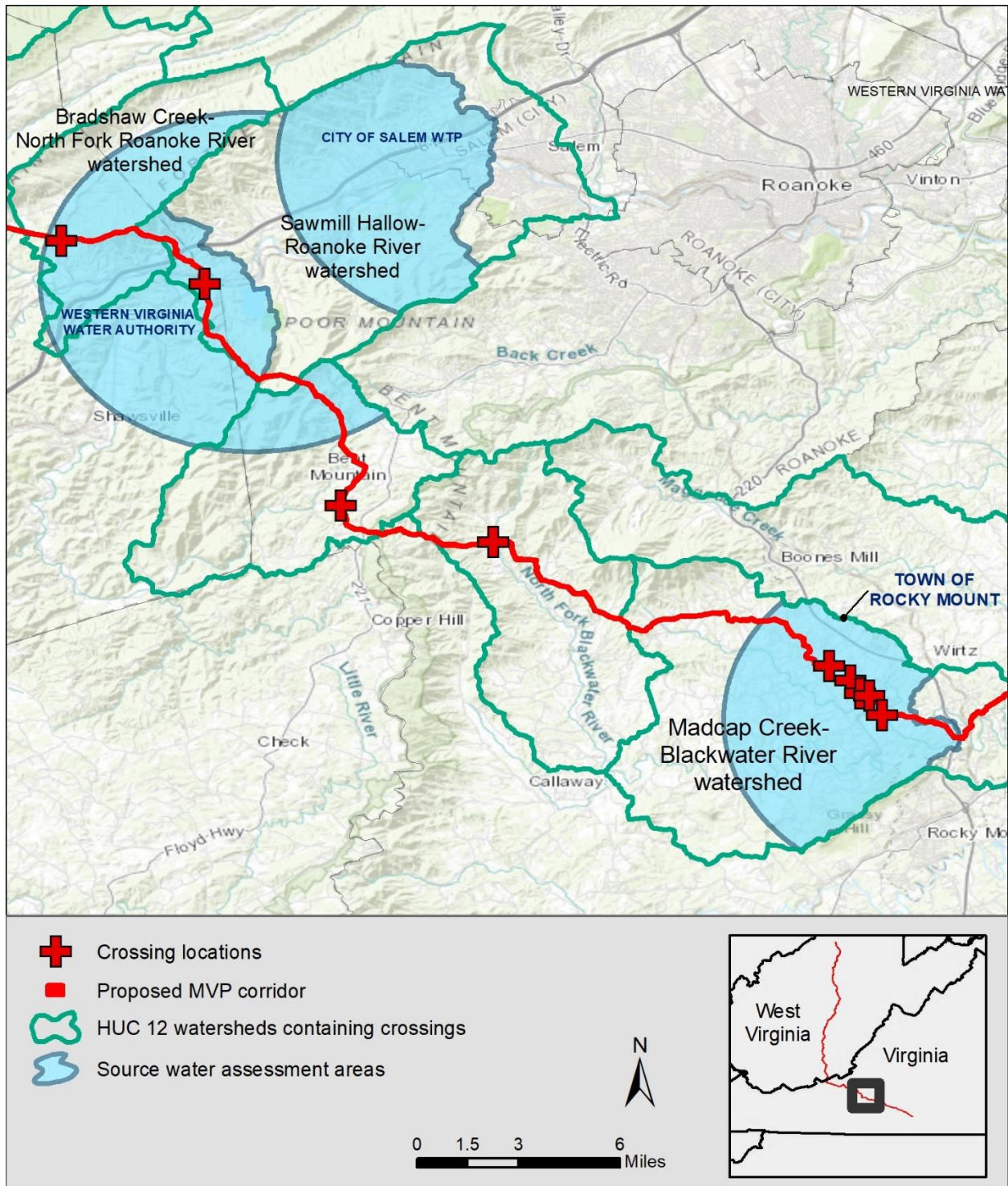
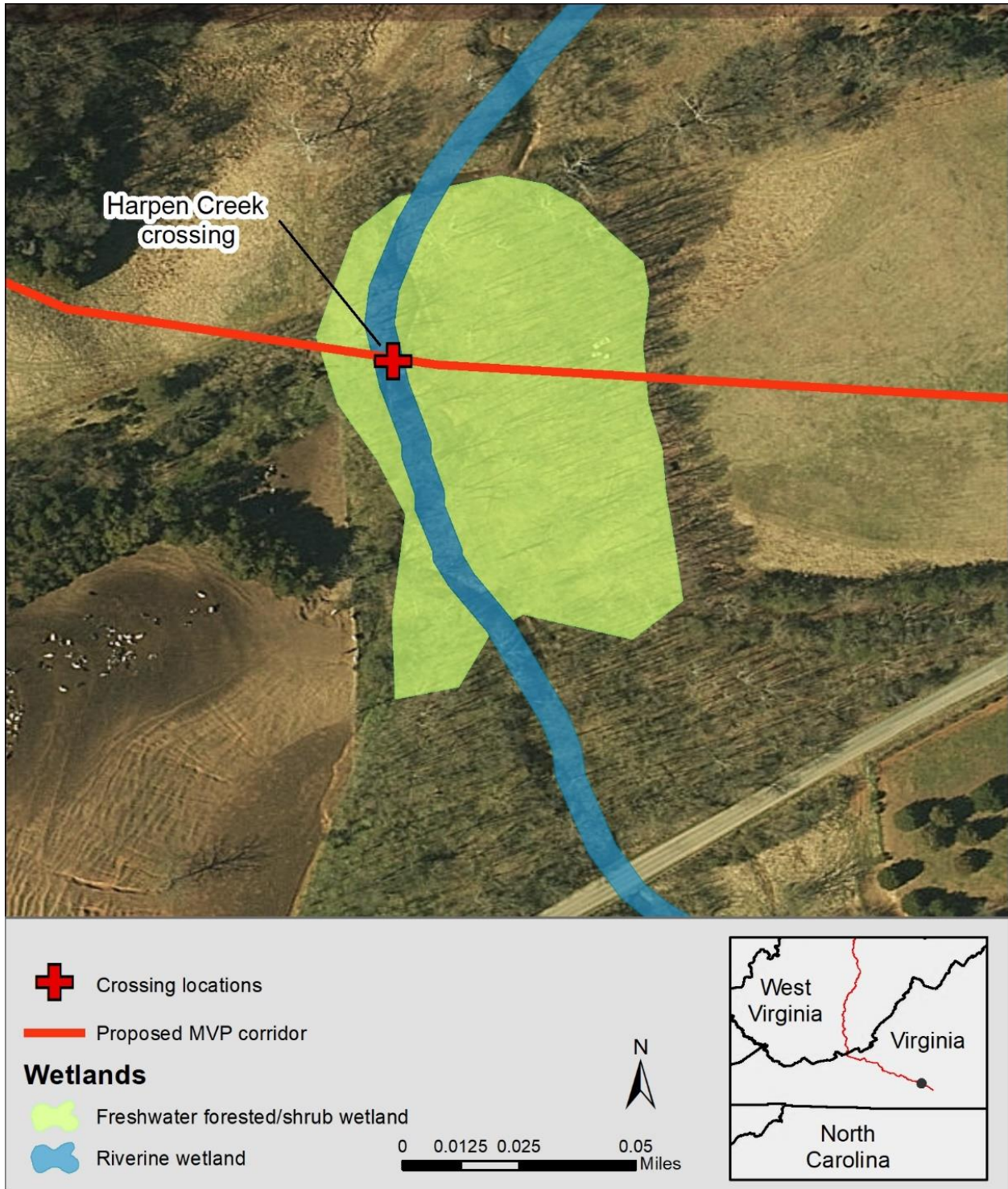


Figure 3: Example of wetland impacts



Sources: Wetland data from USFWS (2017).

### 3. DETAILED IMPACTS ON CROSSED WATERBODIES

As mentioned above, the MVP is projected to cross 18 streams subject to VMRC jurisdiction. In this chapter, detailed impacts are described for five watersheds that contain nine of these crossings.

#### 3.1 Madcap Creek-Blackwater River watershed

The 58-square mile Madcap Creek-Blackwater River watershed is a hydrologic unit code (HUC) 12 watershed (030101010503) within the Upper Roanoke HUC8 watershed (03010101) (See Figure 4).<sup>4</sup> Within this watershed, there are five stream crossings under VMRC jurisdiction. Teels Creek is crossed three times, and Little Creek is crossed twice. These creeks run into the Blackwater River, the source of Rocky Mount's drinking water. All of the crossings in this watershed are within the Town of Rocky Mount's Source Water Assessment Area.

The Virginia Department of Environmental Quality (VDEQ) maintains a list of impaired streams across the state that is updated every two years; this list includes several streams within the Madcap Creek-Blackwater River watershed (VDEQ et al., 2016 and 2017). Teels Creek and Little Creek are biologically impaired, meaning that fewer, less diverse benthic macroinvertebrates were found. These impairments, colored orange in Figure 4, are caused by excess sediment, among other sources (VDEQ et al., 2016 and 2017).

This watershed exemplifies the potential for cumulative impacts. In addition to the five crossings under VMRC jurisdiction, there are numerous other waterbody crossings within the HUC12, including many of Teels Creek, Little Creek, and their tributaries.

The VMRC-regulated crossings would disrupt fish life and kill benthic macroinvertebrate organisms within the construction corridor of the crossing, and the disturbance of the streambank and streambed would cause a marked increase in sedimentation and turbidity. Adding to the cumulative impacts of the MVP would be the sediment generated from upslope, where the pipeline right-of-way would be cleared and where access roads would be built. Because these crossings are so close together and all flow to the same point, the cumulative impacts of these crossings will be felt in Little Creek and potentially in the Blackwater River.

#### 3.2 Little Stony Creek-New River watershed

The 46-square mile Little Stony Creek-New River watershed is a HUC12 watershed (050500020304) within the Middle New HUC8 watershed (05050002) (See Figure 5). Within this watershed, there is one stream crossing under VMRC jurisdiction: Little Stony Creek. Little Stony Creek is classified as a "Wild Trout Stream" at the crossing location (VDGIF, 2018b).

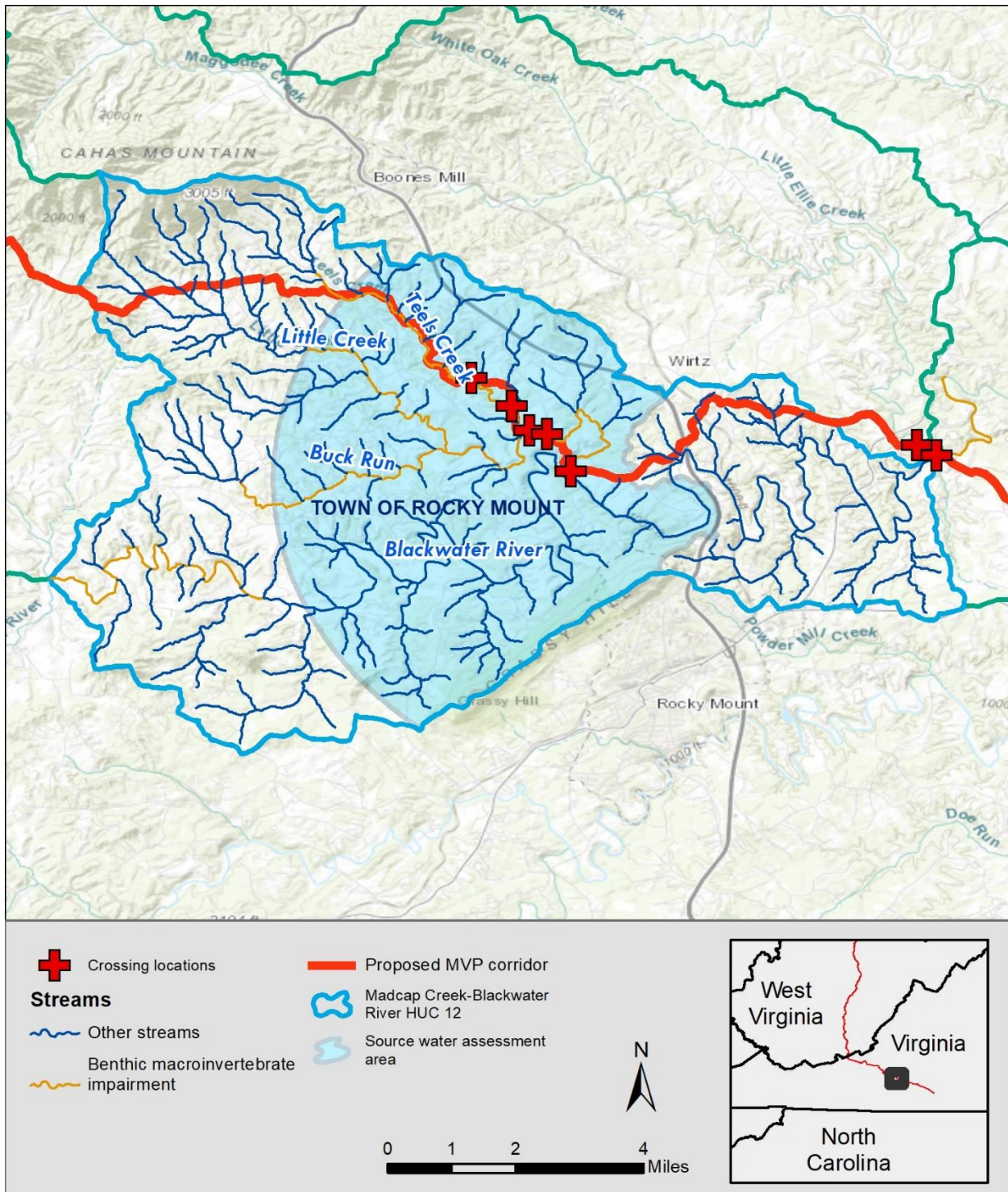
There are seven recreational stream access sites in this watershed, indicating that the area is a popular destination for outdoor recreation. These sites provide access not only to the wild trout streams, but also to the segment designated as an "Exceptional State Water"—also known as a Tier III water—approximately 1.5 miles upstream from the crossing (VDEQ, 2004).

The VMRC-regulated crossing would disrupt fish life and kill benthic macroinvertebrate organisms within the construction corridor of the crossing, and the disturbance of the streambank and streambed would cause a marked increase in sedimentation and turbidity. Adding to the cumulative impacts of the MVP would be the sediment generated from upslope, where the pipeline right-of-way would be cleared and where access roads would be built.

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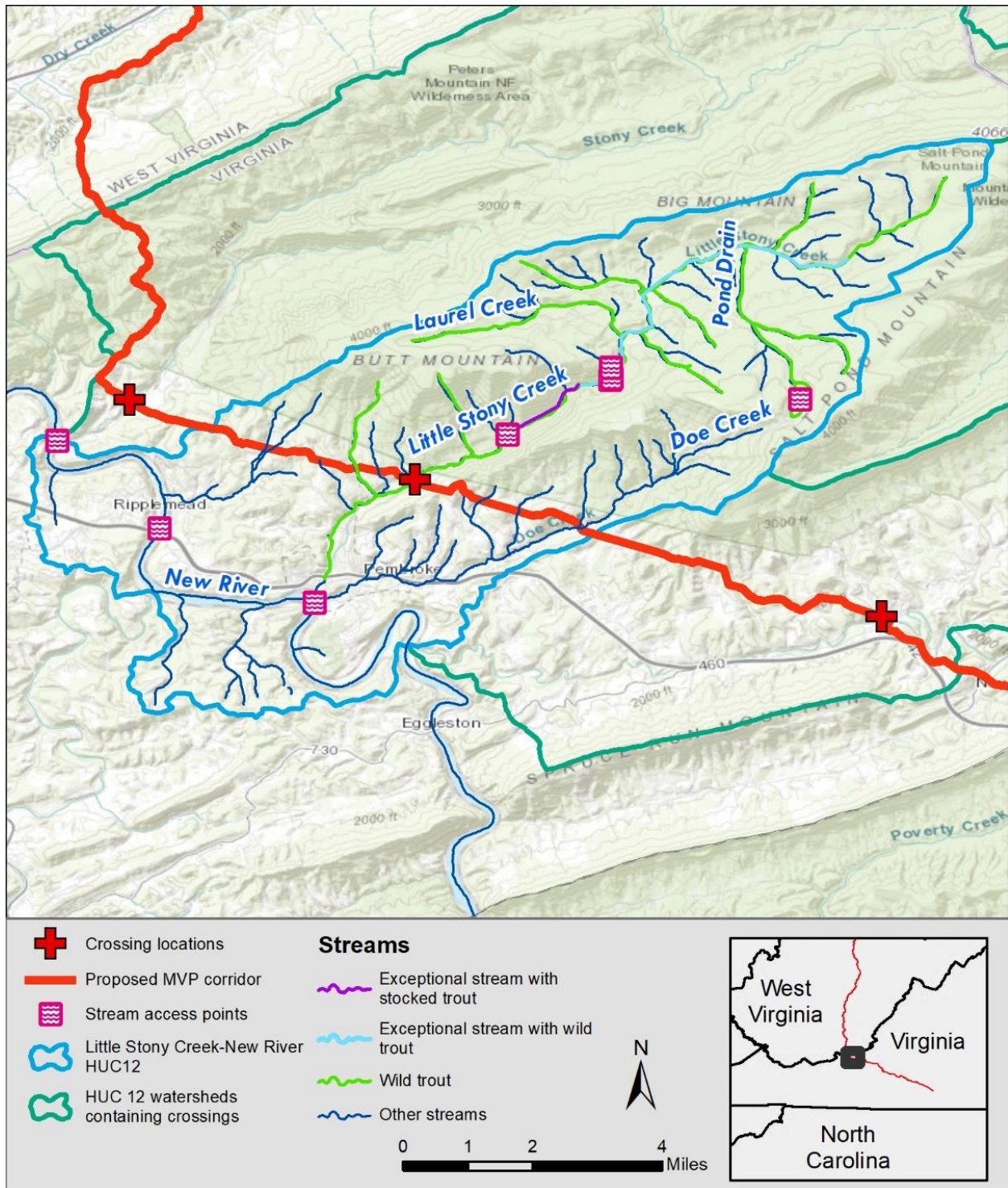
<sup>4</sup> HUCs are used to delineate watersheds—the land area that drains to a single point on a stream. Watersheds are nested, and many HUC12 watersheds are found within each HUC8 watershed.

Figure 4: The Madcap Creek-Blackwater River watershed



Sources: Impairments from VDEQ et al. (2016 and 2017).

Figure 5: The Little Stony Creek-River watershed



### 3.3 Stony Creek watershed

The 49-square mile Little Stony Creek-New River watershed is a HUC12 watershed (050500020305) within the Middle New HUC8 watershed (05050002) (See Figure 6). Within this watershed, there is one stream crossing under VMRC jurisdiction: Stony Creek. Stony Creek is classified as a “Wild Trout Stream” (VDGIF, 2018b) upstream less than one mile from the proposed crossing.

There is a recreational stream access point 1.25 miles downstream from the proposed crossing, near the confluence of Stony Creek with New River.

While conventional bore is planned for the Stony Creek crossing, MVP is authorized to use dry-ditch, open-trench methods if drilling is not practicable (VDGIF, 2018a). If crossed using this method, the VMRC-regulated crossing would disrupt fish life and kill benthic macroinvertebrate organisms within the construction corridor of the crossing, and the disturbance of the streambank and streambed would cause a marked increase in sedimentation and turbidity. Adding to the cumulative impacts of the MVP would be the sediment generated from upslope, where the pipeline right-of-way would be cleared and where access roads would be built.

### 3.4 Trout Creek-Craig Creek watershed

The 52-square mile Trout Creek-Craig Creek watershed is a HUC12 watershed (020802011001) within the Upper James HUC8 watershed (02080201) (See Figure 7). Within this watershed, there is one stream crossing under VMRC jurisdiction: Craig Creek. Craig Creek is stocked with trout downstream approximately 2.5 miles (VDGIF, 2018b). Additionally, Craig Creek, where the proposed crossing is located, has been predicted to have a high likelihood for presence of wild brook trout (Clingerman et al., 2015).<sup>5</sup>

The VMRC-regulated crossing would disrupt fish life and kill benthic macroinvertebrate organisms within the construction corridor of the crossing, and the disturbance of the streambank and streambed would cause a marked increase in sedimentation and turbidity. Adding to the cumulative impacts of the MVP would be the sediment generated from upslope, where the pipeline right-of-way would be cleared and where access roads would be built.

### 3.5 Sawmill Hollow-Roanoke River watershed

The 63-square mile Sawmill Hollow-Roanoke River watershed is a HUC12 watershed (030101010301) within the Upper Roanoke HUC8 watershed (03010101) (See Figure 8). Within this watershed, there is one stream crossing under VMRC jurisdiction: Roanoke River. This proposed crossing is approximately 1.1 miles upstream from a drinking water intake for the Western Virginia Water Authority. The Authority provides drinking water to roughly 60,000 customers in the city of Roanoke and Roanoke, Franklin, and Botetourt counties (Western Virginia Water Authority, 2018). Additionally, the crossing location is likely to cause disruption to boating activities originating from a stream access site only one mile away.

The VMRC-regulated crossing would disrupt fish life and kill benthic macroinvertebrate organisms within the construction corridor of the crossing, and the disturbance of the streambank and streambed would cause a marked increase in sedimentation and turbidity. Adding to the cumulative impacts of the MVP would be the sediment generated from upslope, where the pipeline right-of-way would be cleared and where access roads would be built.

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<sup>5</sup> Stream segments with a predicted likelihood of occurrence greater than or equal to 0.75 were considered “high likelihood of presence.”

Figure 6: The Stony Creek watershed

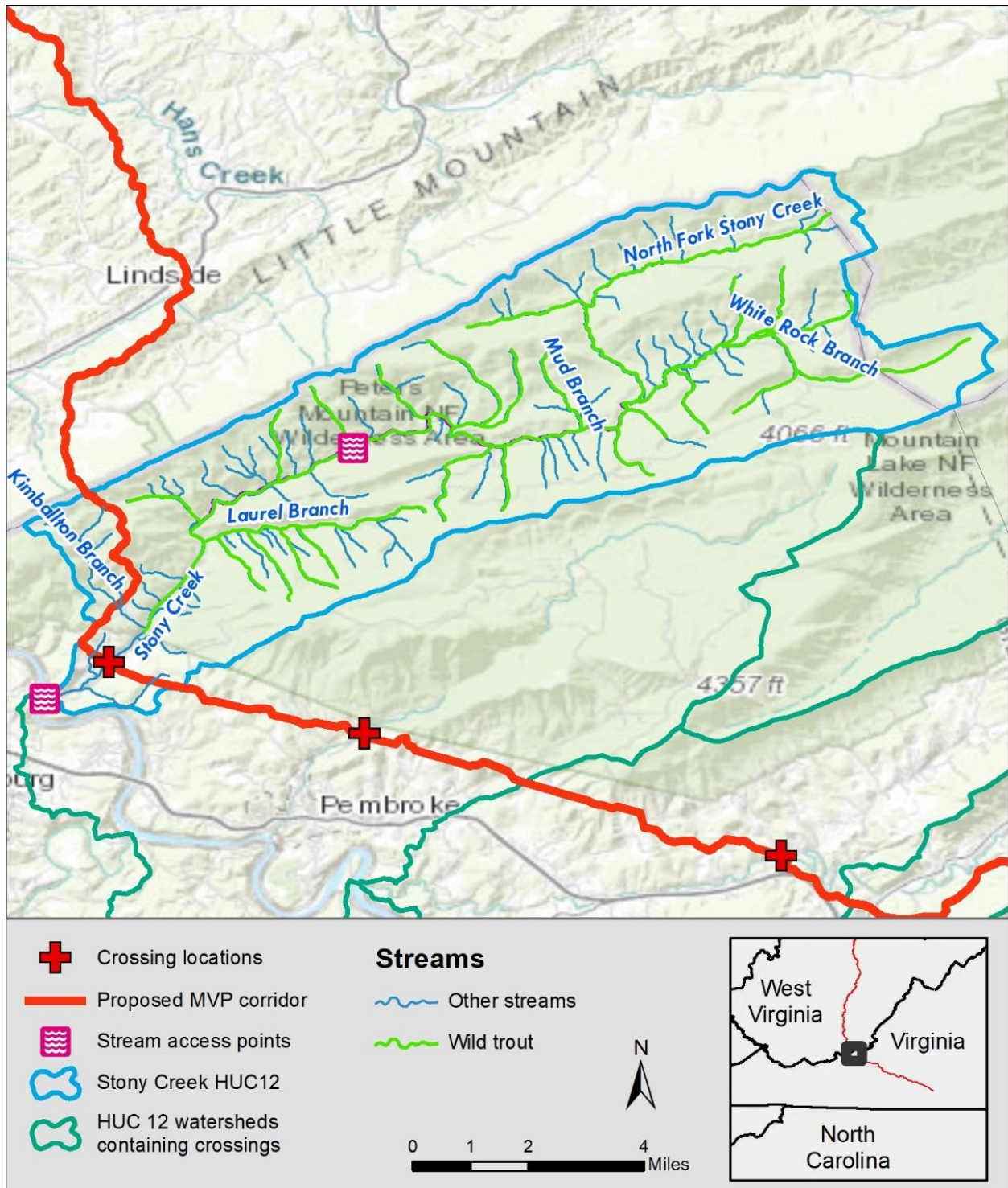
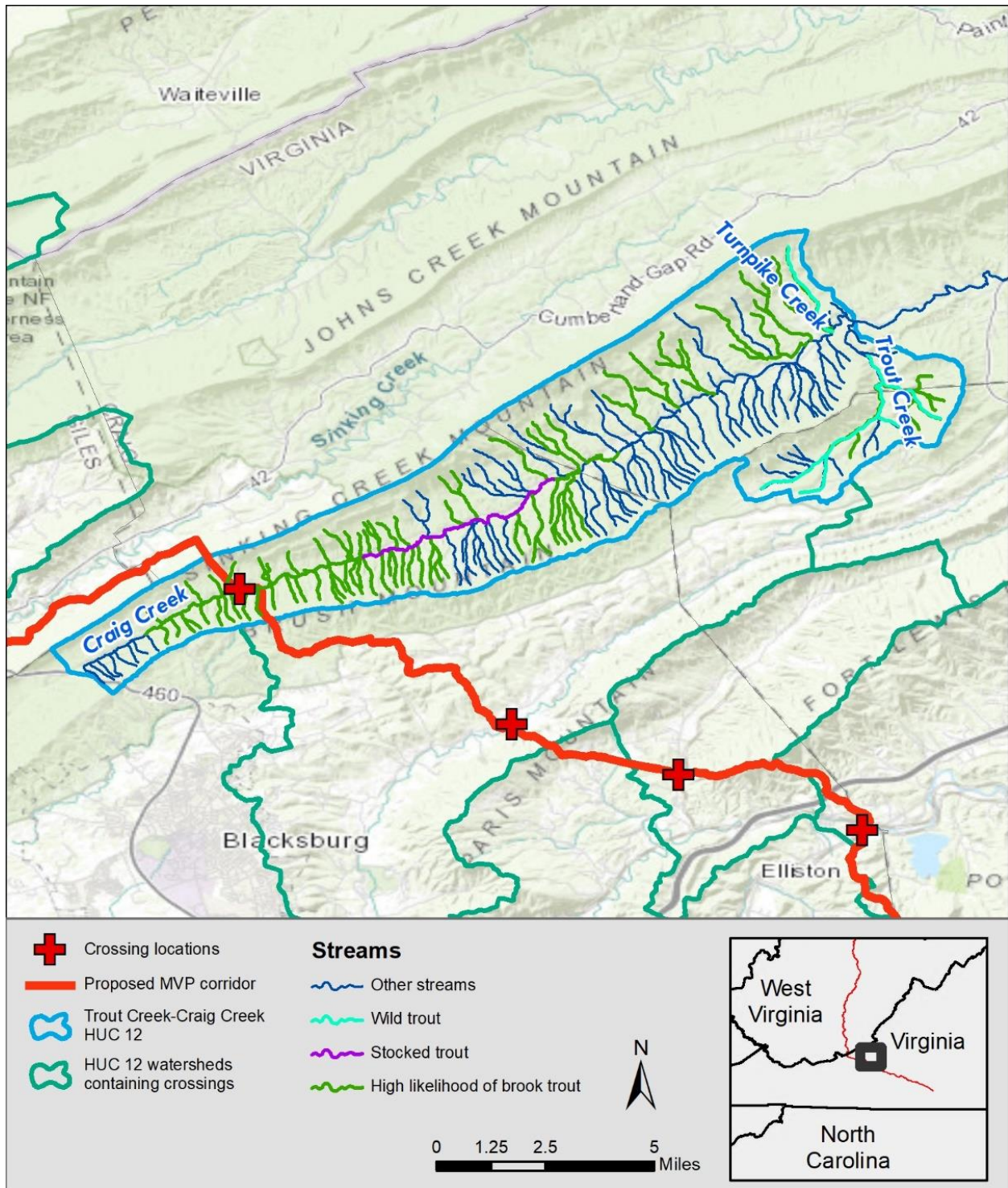


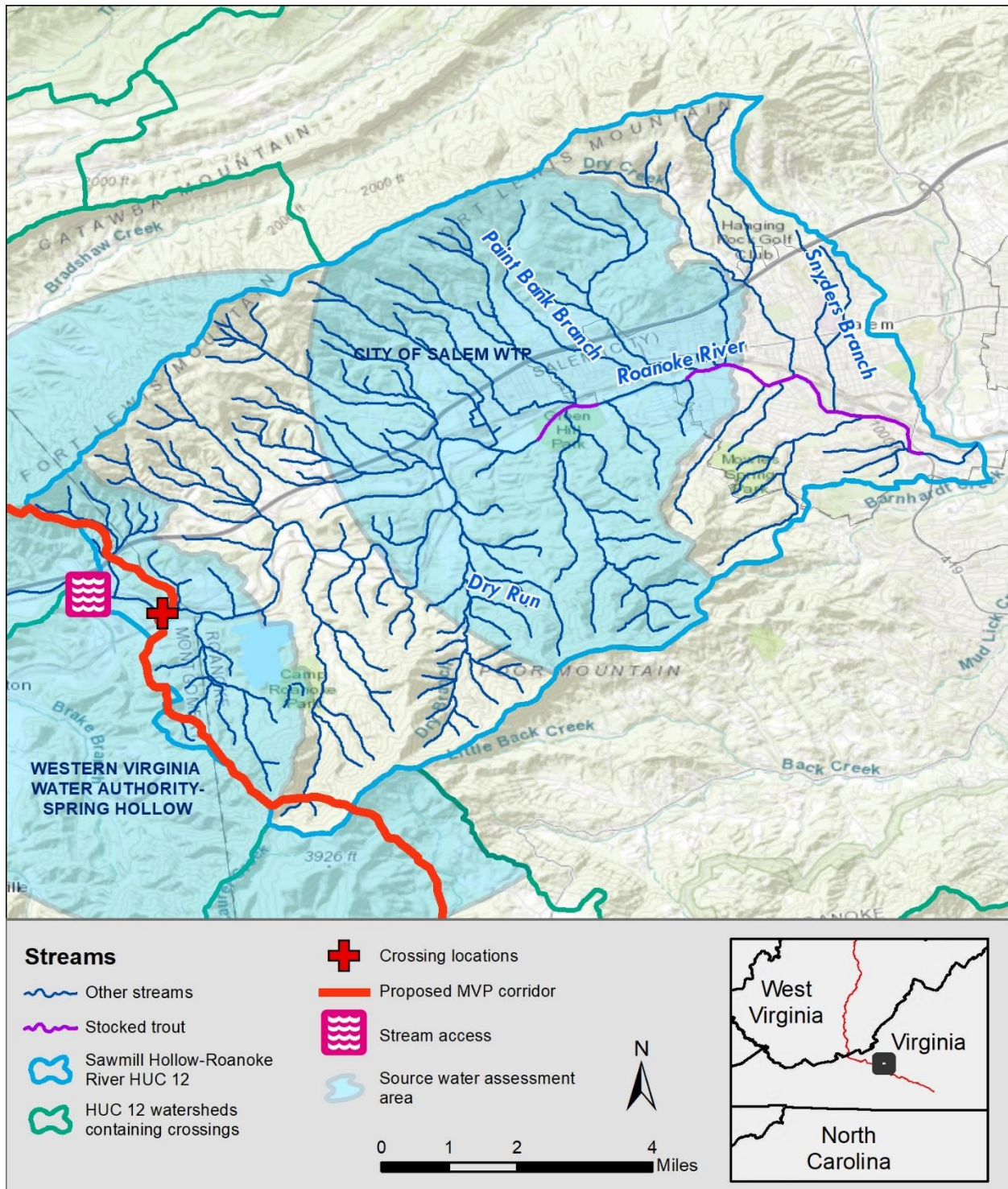
Figure 7: The Trout Creek-Craig Creek watershed



Sources: Brook trout likelihood from Clingerman et al. (2015).



Figure 8: The Sawmill Hollow-Roanoke River watershed



## 4. SUMMARY AND CONCLUSIONS

### 4.1 General impacts

- MVP will cross 16 streams regulated by VMRC using an open-trench method.
- MVP will cross one stream regulated by VMRC using HDD and one using conventional bore; however, MVP is authorized to use dry-ditch, open-trench methods if drilling is not practicable at these two crossings.

### 4.2 Fish and other aquatic life

- Open-trench stream crossings will harm fish and other aquatic life, including native and wild trout.
- Benthic macroinvertebrates will be killed within the construction corridor.
- Sediment from open-trench stream crossings will harm fish and other aquatic life both at the crossing and downstream—directly and as a result of increased instream turbidity. Sediment fills spaces in the streambed that benthic macroinvertebrates need for habitat and smothers the eggs of spawning fish. Muddy water causes decreased feeding and increased stress in some fish, including trout. Sediment and muddy water impact downstream mussels.
- Several trout streams, both wild and stocked, will be impacted by open-trench crossings.

### 4.3 Drinking water

- The MVP would cross two source water assessment areas upstream from drinking water intakes: (1) Town of Rocky Mount, Blackwater River and (2) Western Virginia Water Authority-Spring Hollow.
- These source water assessment areas contain seven crossings under VMRC's jurisdiction, with crossings as close as 1.1 miles from a drinking water supply intake.
- Impacts of crossings on these nearby, downstream drinking water intakes should be accounted for by regulatory agencies.

### 4.4 Recreation

- Sediment and increased turbidity produced by the open-trench stream crossings may impact fishing, boating, and swimming opportunities accessible from nearby stream access points.
- A total of 14 recreational access points were found to be in close proximity to eight VMRC-regulated stream crossings.

### 4.5 Wetlands

- Riparian, riverine wetlands will be impacted at each of the open-trench crossings.
- Several of these crossings will also impact larger, forest/shrub wetlands adjacent to Little Creek, Harpen Creek, Mill Creek, and Teels Creek.

### 4.6 Watershed-specific conclusions

- In the watersheds discussed below,<sup>6</sup> the VMRC-regulated crossings would disrupt fish life and kill benthic macroinvertebrate organisms within the construction corridor of the crossing, and the disturbance of the streambank and streambed would cause a marked increase in sedimentation and

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<sup>6</sup> While conventional bore is planned for the Stony Creek crossing, MVP is authorized to use dry-ditch, open-trench methods if drilling is not practicable (VDGIF, 2018a).

turbidity. Adding to the cumulative impacts of the MVP would be the sediment generated from upslope, where the pipeline right-of-way would be cleared and where access roads would be built.

#### 4.6.1 *Madcap Creek-Blackwater River watershed*

- Five VMRC-regulated crossings are located in the Madcap Creek-Blackwater River watershed.
- All five are within the smaller Teels Creek/Little Creek subwatershed.
- At least seven other crossings in the headwaters of this watershed are unregulated by VMRC. Sediment from these crossings—along with upland portions of the pipeline corridor—will likely contribute to cumulative impacts to Little Creek and downstream into the Blackwater River.
- All five VMRC-regulated crossings are on biologically impaired waters in which sediment is already harming aquatic life.
- All five VMRC-regulated crossings fall within the Town of Rocky Mount, Blackwater River Source Water Assessment Area; the drinking water intake is approximately 3.2 river miles downstream from the nearest VMRC-regulated crossing.

#### 4.6.2 *Little Stony Creek-New River watershed*

- Within this watershed, there is one stream crossings under VMRC jurisdiction: Little Stony Creek.
- As a wild trout stream, and Tier III water (just upstream), Little Stony Creek represents a valuable and unique public resource.
- There are seven stream access sites in this watershed, indicating that the area is a popular destination for outdoor recreation. The use of many of these access sites may be reduced by the increased turbidity caused by the pipeline construction.

#### 4.6.3 *Stony Creek watershed*

- Within this watershed, there is one stream crossings under VMRC jurisdiction: Stony Creek.
- As a wild trout stream (just upstream), Stony Creek represents a valuable and unique public resource.
- There is a stream access point 1.25 miles downstream from the proposed crossing, near the confluence of Stony Creek with New River. The use of this access site may be reduced by the increased turbidity caused by the pipeline construction, should MVP use a dry-ditch, open-trench method for this crossing.

#### 4.6.4 *Trout Creek-Craig Creek watershed*

- Within this watershed, there is one stream crossings under VMRC jurisdiction: Craig Creek.
- As a stream that is highly likely to contain brook trout at the crossing location and as a stocked trout stream approximately 2.5 miles downstream of the proposed pipeline crossing, Craig Creek represents a valuable and unique public resource.

#### 4.6.5 *Sawmill Hollow-Roanoke River watershed*

- Within this watershed, there is one stream crossings under VMRC jurisdiction: Roanoke River.
- This crossing falls within the Western Virginia Water Authority Source Water Assessment Area, which provides drinking water for the city of Roanoke and three counties; the drinking water intake is approximately 1.1 river miles downstream from the nearest VMRC-regulated crossing.
- This crossing location is likely to cause disruption to boating activities originating from a stream access site only one mile away.

## REFERENCES

- Adams, D. 2015. Pipeline opponents cite contamination of drinking water supply as cautionary tale. The Roanoke Times. December 3. [http://www.roanoke.com/business/news/pipeline-opponents-cite-contamination-of-drinking-water-supply-as-cautionary/article\\_1172b929-8960-54a6-abdc-1784023dd5b9.html](http://www.roanoke.com/business/news/pipeline-opponents-cite-contamination-of-drinking-water-supply-as-cautionary/article_1172b929-8960-54a6-abdc-1784023dd5b9.html)
- Armitage, PD and Gunn, RJM. 1996. Differential response of benthos to natural and anthropogenic disturbances in 3 lowland streams. *Internationale Revue der Gesamten Hydrobiologie*, 81(2), 161–181.
- Clingerman, J, Petty, T, and Boettner, F. 2015. Chesapeake Bay Watershed Brook Trout Habitat and Climate Change Vulnerability Assessment. Report submitted to North Atlantic Landscape Conservation Cooperative. [http://downstreamstrategies.com/documents/reports\\_publication/ches-bay-brook-trout-report\\_final.pdf](http://downstreamstrategies.com/documents/reports_publication/ches-bay-brook-trout-report_final.pdf)
- Clingerman, J and Hansen E. 2017. Atlantic Coast Pipeline Sediment Modeling Methodology. Downstream Strategies. Prepared for Appalachian Mountain Advocates. April 6.
- \_\_\_\_\_. 2016. Mountain Valley Pipeline Sediment Modeling Methodology. Downstream Strategies. Prepared for Appalachian Mountain Advocates. December 16.
- Environmental Solutions & Innovations. 2017. Hydrologic Analysis of Sedimentation, Mountain Valley Pipeline, Jefferson National Forest, Eastern Divide Ranger District. Prepared for: U.S. Department of Agriculture, Forest Service. Prepared on behalf of: Mountain Valley Pipeline. March 1. <https://www.ferc.gov/industries/gas/enviro/eis/2017/06-23-17-FEIS/Appendix-O.pdf>
- Federal Energy Regulatory Commission (FERC). 2017a. Mountain Valley Project and Equitrans Expansion Project, Final Environmental Impact Statement, Volume I. Atlantic Coast Pipeline, LLC, Dominion Energy Transmission, Inc., Docket Nos. CP16-10-000 and CP16-13-000, FERC/FEIS-0272F. June 23. <https://www.ferc.gov/industries/gas/enviro/eis/2017/06-23-17-FEIS/Final-Environmental-Impact-Statement.pdf>
- \_\_\_\_\_. 2017b. Atlantic Coast Pipeline and Supply Header Project, Final Environmental Impact Statement, Volume I. Atlantic Coast Pipeline, LLC, Dominion Energy Transmission, Inc., Docket Nos. CP15-554-000, CP15-554-001, CP15-555-000, and CP15-556-000, FERC/EIS-0274F. July 21. <https://www.ferc.gov/industries/gas/enviro/eis/2017/07-21-17-FEIS/volume-I.pdf>
- Lévesque, L and Dubé, M. 2007. Review of the effects of in-stream pipeline crossing construction on aquatic ecosystems and examination of Canadian methodologies for impact assessment. *Environ Monit Assess* 132:395–409.
- Mountain Valley Pipeline, LLC (MVP). 2017. Mountain Valley Pipeline Project Overview. <https://www.mountainvalleypipeline.info/>
- Tetra Tech. 2017. Mountain Valley Pipeline Figures and Drawings. September 12.
- U.S. Fish and Wildlife Service (USFWS). 2017. National Wetlands Inventory – Version 2 – Surface Waters and Wetlands Inventory. <https://www.fws.gov/wetlands/data/data-download.html>
- Virginia Department of Environmental Quality (VDEQ). 2017. Certification No. 17-001: 401 Water Quality Certification Issued To Mountain Valley Pipeline, LLC. [http://www.deq.virginia.gov/Portals/0/DEQ/Water/Pipelines/MVP\\_Certification\\_Final.pdf?ver=2017-12-08-130141-433](http://www.deq.virginia.gov/Portals/0/DEQ/Water/Pipelines/MVP_Certification_Final.pdf?ver=2017-12-08-130141-433)

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- \_\_\_\_\_. 2004. Exceptional State Waters (Tier III). Accessed January 16, 2018.  
[http://www.deq.virginia.gov/Programs/Water/WaterQualityInformationTMDLs/WaterQualityStandards/ExceptionalStateWaters\(TierIII\).aspx](http://www.deq.virginia.gov/Programs/Water/WaterQualityInformationTMDLs/WaterQualityStandards/ExceptionalStateWaters(TierIII).aspx)
- Virginia Department of Environmental Quality (VDEQ), Virginia Department of Conservation & Recreation (VDCR), and Virginia Department of Health (VDOH). 2017. Virginia Water Quality Assessment 305(b)/303(d) Integrated Report, 2016 (Draft). August.  
[http://www.deq.virginia.gov/Portals/0/DEQ/Water/WaterQualityAssessments/IntegratedReport/2016/ir16\\_Integrated\\_Report\\_Full\\_Draft.pdf](http://www.deq.virginia.gov/Portals/0/DEQ/Water/WaterQualityAssessments/IntegratedReport/2016/ir16_Integrated_Report_Full_Draft.pdf)
- \_\_\_\_\_. 2016. Virginia Water Quality Assessment 305(b)/303(d) Integrated Report, 2014 (Final). May.  
[http://www.deq.virginia.gov/Portals/0/DEQ/Water/WaterQualityAssessments/IntegratedReport/2014/ir14\\_Integrated\\_Report\\_Final.pdf](http://www.deq.virginia.gov/Portals/0/DEQ/Water/WaterQualityAssessments/IntegratedReport/2014/ir14_Integrated_Report_Final.pdf)
- Virginia Department of Game and Inland Fisheries (VDGIF). 2018a. Email from Ernie Aschenbach, Environmental Services Biologist, to Randy Owen, Virginia Marine Resources Commission. Received January 8.
- \_\_\_\_\_. 2018b. Virginia Trout Fishing. Online mapping application, accessed January 16.  
<https://dgif-virginia.maps.arcgis.com/apps/webappviewer/index.html?id=441ed456c8664166bb735b1db6024e48>
- Virginia Department of Health (VDOH). Office of Drinking Water. 2018. GIS data for Source Water Assessment Areas within counties crossed by the MVP. Personal communication with author Betcher. January 16.
- Virginia Marine Resources Commission (VMRC). 2005. Subaqueous Guidelines.  
[http://mrc.virginia.gov/regulations/subaqueous\\_guidelines.shtm](http://mrc.virginia.gov/regulations/subaqueous_guidelines.shtm)
- Watkins, T and Ellis, R. 2014. Bottled water for West Virginia residents plagued by chemical in water supply. CNN. Archived from the original on January 11, 2014. Retrieved January 17, 2017.  
<http://www.cnn.com/2014/01/11/us/west-virginia-contaminated-water/>
- Western Virginia Water Authority. 2018. General Information. Accessed January 21.  
<https://www.westernvawater.org/about-us/general-information>