A COLLABORATIVE APPROACH

A PROPOSAL
FOR A MASTER PLAN FOR
THE NORTH FORK
OF THE SHENANDOAH RIVER

Anna-Beth Lawler
Maria Tahamtani
Kevin Kask
Tyler Hinkle

"Water has always played a central role in the history of the Shenandoah Valley."

-Shenandoah Valley Water Resources Strategic Plan 2008

A COLLABORATIVE APPROACH

A PROPOSAL
FOR A MASTER PLAN FOR
THE NORTH FORK
OF THE SHENANDOAH RIVER

Anna-Beth Lawler
Maria Tahamtani
Kevin Kask
Tyler Hinkle

Dr. Frank Dukes
University of Virginia
Collaborative Planning for Sustainability
December 9, 2019

CONTENTS:

SECTION I:
EXECUTIVE SUMMARY

The purpose of this report is to provide a process for Shenandoah County to envision the future of the North Fork of the Shenandoah River and its tributaries in a manner that both respects and incorporates all voices that are connected with, or impacted by, the watershed. While this report does not provide an all-inclusive answer to the opportunities and issues that the watershed offers and faces, it provides a method of revealing and developing the answers in a manner that is inclusive and flexible for the time that the answers are needed. This report calls for a plan that empowers the County and the people of the watershed to work together to do good through building off of existing assets.

While Shenandoah County is defined by the unique identities that exist within the County from the six towns, numerous villages and hamlets, to the sports teams at the three school campuses, the County has one aspect in common: unity around water and specifically the North Fork of the Shenandoah River. From memories of going fishing with grandparents, tubing with friends, learning about the animals and plants in science class, or having a picnic with the family along the River, everyone connects through the North Fork. Currently there are only eight official access sites along the total 116 river miles of the North Fork and three of which have boat ramps. In addition to the lack of coordination on access locations on the North Fork, there are no official fishing or access sites on the ten public creeks or connections from the river to the other major

natural resource in the County: the mountains. This report seeks to address this as well as bridge the gap between all river users from tourists to farmers and ensure that future improvements help all, as well as improve water quality.

This report addresses Virginia State code section § 28.2-1200, which states that all lands under perennial creeks and rivers are considered public. According to the United States Army Corps of Engineers, a general standard to measuring which waters are public is through taking into account all perennial waters that have a five square mile drainage basin. A map to the right demonstrates the public creek and river beds in Shenandoah County. The importance of this code section is that while the State of Virginia provides clarity on the ownership of the ten creeks and the North Fork of the Shenandoah River, there is no clarity on the best method of providing access to the public waters, addressing the quality of the water, or infrastructural improvements for the public waters that also increase the quality of life of the community. This report addresses said gaps.

The report is broken into six sections with the first section, this section, serving as an executive summary for the entire report. The second section outlines the group covenant that was developed by the students at the University of Virginia who worked on developing this report. The third section provides a situational assessment on the watershed in order to outline the key threats as well as the opportu-

Shenandoah County
Public River And Creek Beds

N

0   4   8   16 Miles

Legend
● Hand Launch
● Boat Ramp
— Public Land Under The North Fork
— Public Land Under Creek Beds
— Public Trails
▨ Town

Cedar Creek
Toms Brook
Little Stony Creek
Passage Creek
Stony Creek
Stony Creek
Mill Creek
Holmans Creek

Source: VDGIF, DEQ, NID,
and Shenandoah County GIS
Author Tyler Hinkle   Date: 2-12-2020
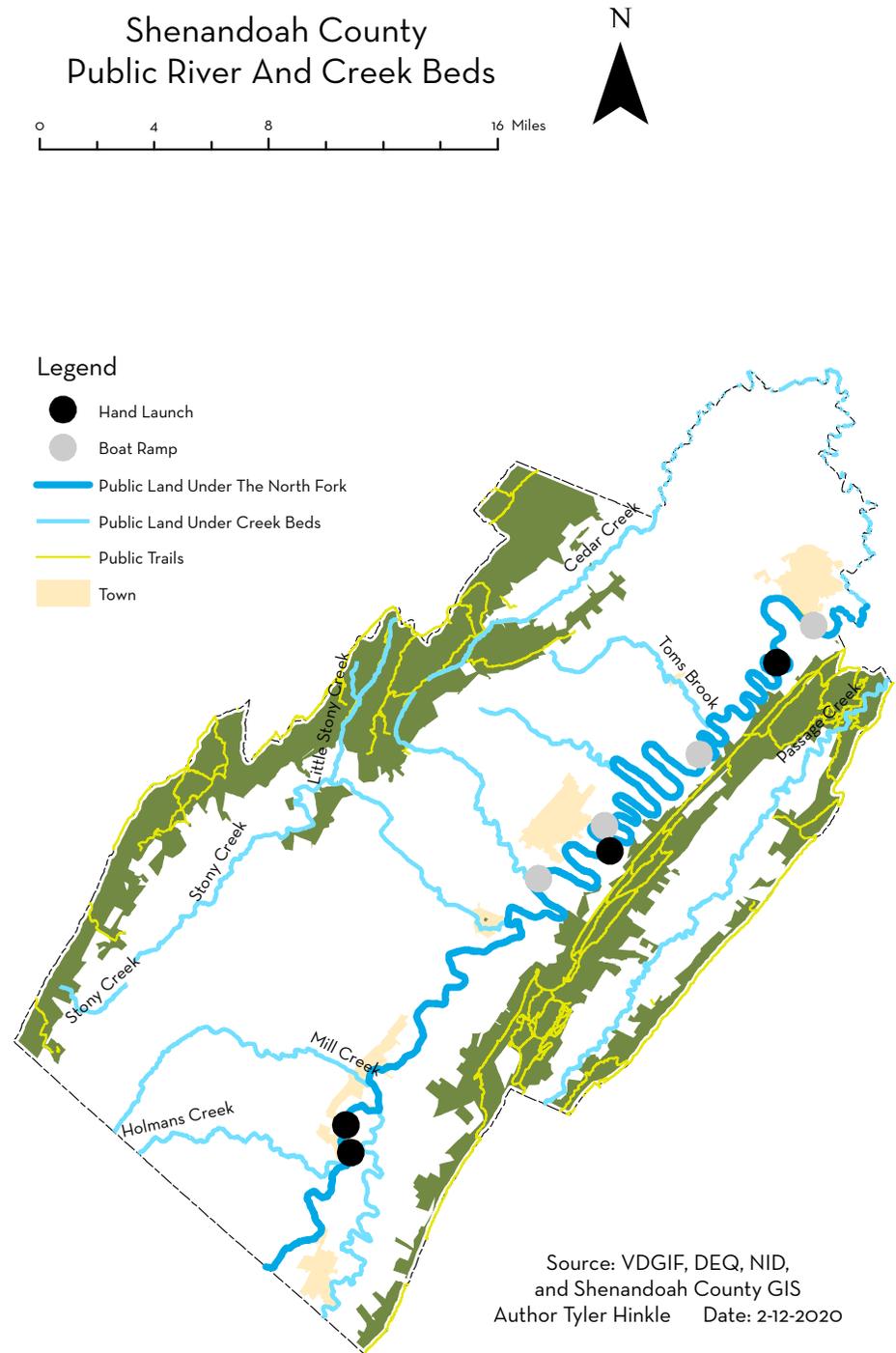
nities for the watershed in Shenandoah County along with numerous maps that detail the current conditions of the watershed within Shenandoah County. These maps demonstrate that the major contributor of pollutants into the watershed is not one actor, rather the North Fork's watershed faces issues from all sides with non-point source, or non-traceable, pollution from wildlife and agriculture to urban runoff and unknown sources. Section four delves more in-depth with the purpose and goals of this report, as well as the learning objectives that the student researchers held with overall objectives as well as specific objectives for access and quality. Section five provides the core research findings in the report, including recommendations, case studies, and cohesive visioning ideas for what future efforts could be focused upon. These recommendations include the process that has been summarized to the right where meetings would be held with each river and creek community in order to determine the vision, desires, and needs of the communities as they relate to the watershed. The sixth and final section outlines the process that should be followed after meetings are held, as well as a method of evaluating the process and plan itself so it may be improved.

The following will seek to provide a concise outline of the process of both developing the plan and implementing a collaborative process that will live on past the plan. On page six a gantt chart demonstrates the timeline for the development of the proposed master plan. The first three months include staff consultation with relevant agencies in order to develop

Step I: Consult Key Agencies

Step II: Identify Community Champions

Step III: Community Collaboration

- Interview one on one, or use survey to gather core values.
- Identify needs in the community.
- Workshop initial locations for improvements.

Step IV: Refine Improvements

Step V: Implement

Requirements For Improving Sites

- Sites must either already be an existing DWR site, or come from a River or Creek Community recommendation.

- Sites must provide adequate parking in accordance to VDOT, and options for walking and biking if feasible.

- Sites must be reviewed by local law enforcement to ensure proper visibility of the site is possible.

- Trash and recycling as well as maintenance of the site must be set in an agreement with a local non-profit or other organization.

- Feasibility studies will be performed to ensure proper sanitation facilities can be located in accordance with VDH.

a set of standards that may be used to guide any sites that are existing or proposed by communities, as well as methods to share with communities on how they can work together to improve water quality and develop their own improvements. This period also includes the time needed to develop an agenda that will allow for meetings that will only take an hour or two of community members' time, and the time to identify the existing community champions who have connections that can be built upon for discussion and collaboration. This first period also includes time for key agencies to review the process and make sure that all legal aspects are addressed before work begins. Time is also set for key aspects to have at the meetings and when and where such meetings will occur, as well as methods for people to participate in a safe manner in relation to COVID-19. On the left is an example of guiding materials which guide to ensure that all individuals have a say in future access points in a collaborative manner. With clear requirements and a clear process for adding new sites, the plan is a generative process and a framework to ensure that all parties come out on top and there are no losers.

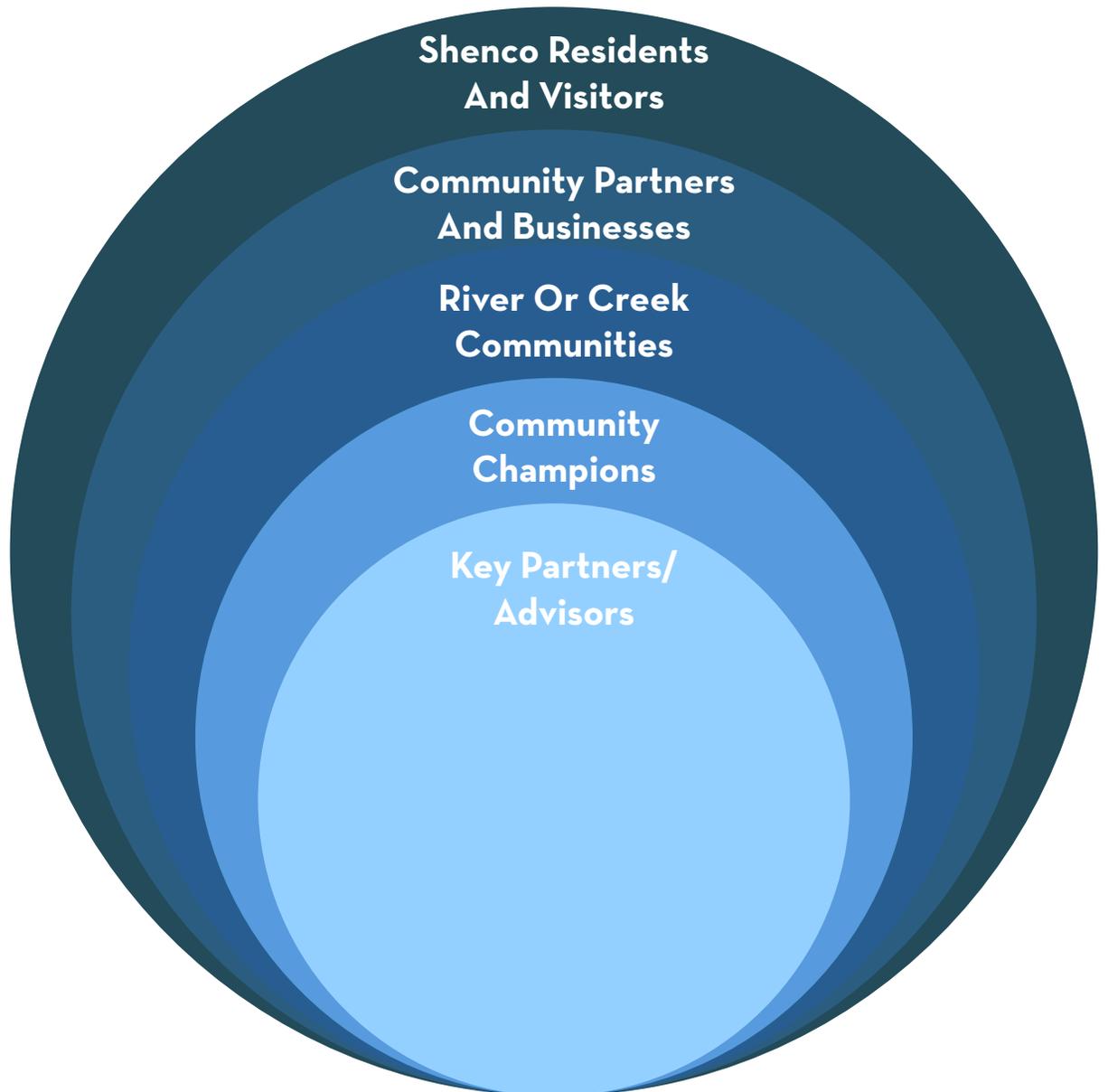After the community meetings, staff will coordinate with community champions to determine any updates. Once this has been completed the findings will be compiled into the final plan, along with potential outside funding sources. If approved, the plan will serve as a cohesive statement of the vision of Shenandoah County's watershed to outside individuals, yet it can also be amended by future generations.

KEY TAKEAWAYS

A Master Plan for the North Fork of the Shenandoah River may lead to may benefits from new businesses, tourist attractions, cleaner waters, and the potential for property values to increase. Yet, the most important benefit from a Master Plan is the improvement of the quality of life of people in Shenandoah County, as well as those who visit it. The improvements in the quality of life is summarized below:

1. Expanding educational opportunities with outdoor classrooms and educational signage on trails and access areas.
2. Pride in the River and the watershed serving to further unify Shenandoah County and connect everyone in the County.
3. Four-season recreational amenities from tubing/kayaking, fishing or ice fishing, outdoor workout equipment, to running, walking, biking, and hiking trails.
4. Providing safe access points to the River and the ten public streams to reduce the stress on users and landowners.
5. Connecting the entire County with a County-wide park that will both benefit those who live here, and those who come to visit.

LAYERS OF COLLABORATION

Shenco Residents
And Visitors

Community Partners
And Businesses

River Or Creek
Communities

Community
Champions

Key Partners/
Advisors

	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12
Agency Preparation	■											
Agenda Setting	■											
Identify Champions	■	■										
Setting Dates And Locations		■	■									
Agency Review Meeting		■	■		■		■		■			
Writing	■	■	■	■	■	■	■	■	■	■	■	
Community Meetings				■	■	■	■	■	■			
Identify Funds							■	■	■	■	■	
Community Review										■	■	
Final Review										■	■	
Final Edits											■	
Final Presentation												■

SECTION II:
GROUP COVENANT ASSESSMENT

As an effort to effectively cooperate, our team made a group covenant, promising to hold one another accountable to a set of collectively made standards. The aspirations we determined for this project include:

1. **Curiosity before Judgement** - Always ask for clarification and be willing to learn from the perspectives of others.

2. **Honesty before Frustration** - Be open to sharing concerns with the group, or with individual members when they arise, giving enough time for others to change/adjust or to counter.

3. **Equity in Work Distribution** - Ensure every team member contributes equally, understanding that some tasks require more work than others, and considering everyone's strengths and weaknesses to ensure that we are performing at our collective best.

4. **Accountability to the Team** - In both work product and physical presence, strive to be open and honest about personal successes as well as difficulties, ensuring that the team can count on your contributions to the whole in a timely manner or account for your difficulties before they place too much of a burden on the rest of the project team.

We feel that our team was dedicated to reaching our aspirations for this project while remaining respectful and honest to each other. We understood the need to practice "Curiosity before Judgement" throughout the project. We were honest with each other when attempting to remain true to project goals and specific requirements, always referring back to these requirements and openly addressing any holes in the assessment and proposal we compiled. We attempted to remain equitable in work assignment, dividing the project into "Access" and "Quality" subgroups and assigning two team members to each topic based on preference. The work was roughly equal between the groups, and as such the structure of our collaborative effort felt well-balanced throughout.

Finally, we were able to overcome personal difficulties faced by individual members of the team through accountability and open communication among members. We made ourselves available either in-person or by phone whenever possible to ensure constant reliability. Lastly, we referred back to our covenant several times, and have found a group covenant to be a wonderful tool for positive collaboration for which we were extremely thankful. We believe that efforts made by Shenandoah County and its partner organizations should also implement a group covenant of mutual understanding so that values rather than actions and situations guide the conversation forward.

SECTION III:
SITUATION ASSESSMENT

The complete **Shenandoah River Watershed** runs from Waynesboro, Virginia in Augusta County - including parts of Maryland - all the way to Harpers Ferry, West Virginia, and is part of the Chesapeake Bay TMDL WIP. The Shenandoah River splits at Front Royal, Virginia in Warren County, into two forks. The South Fork's headwaters are near Waynesboro, and the North Fork, which is the main focus of this proposal, has its headwaters in Bergton, Virginia in Rockingham County..

The watershed faces three main opportunities: access, quality, and infrastructure, with the overarching opportunity being the improvement of the quality of life for all in the watershed.
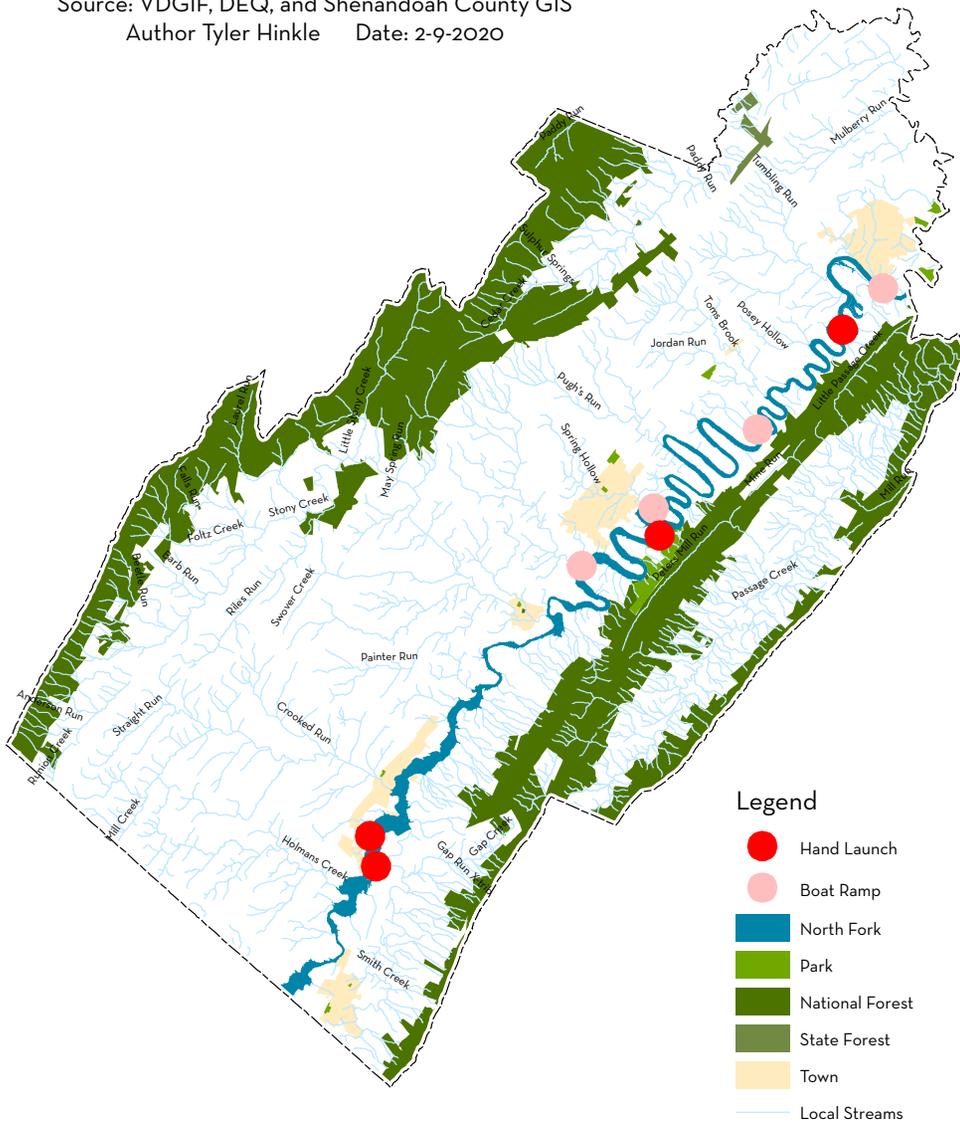
The total 116 miles of the **North Fork Of The Shenandoah River** are currently accessible to the public via eight access points, four with boat ramps and four with only hand-launch options. Access issues range from the need for greater road and 911 emergency access, boat landings, community approved and agreed upon fishing locations and walkable access points that will not cause nuisance concerns for riverfront private property owners. Vehicular access to the access points is another concern with vehicles currently parking on the shoulders of nearby roads to access the River. Adjacent landowners are also concerned with River users trespassing onto their property in order to access the River. Lastly, because the access points are +/- 13 linear miles apart, with miles on the river being further, short recreational boat trips on the North Fork are currently

9

**Shenandoah County
Existing Access Conditions**

0   4   8   16 Miles

Source: VDGIF, DEQ, and Shenandoah County GIS
Author Tyler Hinkle   Date: 2-9-2020

N

Legend

🔴 Hand Launch

🔴 Boat Ramp

▬ North Fork

▬ Park

▬ National Forest

▬ State Forest

▬ Town

▬ Local Streams

The Shenandoah River watershed is threatened by major point and non-point source pollution. Point source pollution for the main stem of the Shenandoah River and the South Fork includes mercury, which was released by the former E.I. du Pont de Nemours and Company (Du-Pont) plant for thirty years beginning in 1920. The DuPont plant was located in Waynesboro Virginia, and releases from the plant were carried by sewer drains through to the South River, continuing downstream to the South Fork Shenando-ah River and ultimately into the Shenandoah River as well.

In addition, the Shenandoah continuously faces pollution from E Coli, nitrates and other chemicals, and other point source pollution. The North Fork of the Shenandoah River, which runs through Shenandoah County, faces issues of impairment due to large amounts of runoff from agricultural, commercial, and residential lands. While there are instanc-es of point source pollution in the North Fork watershed, majority of pollution derives from non-point source which is not as heavily regulated by the United States Environmental Protection Agency as point source pollution.

Point source pollution refers to waste, chemicals, sed-iment, or other materials introduced to a water-source by means of a pipe. An example of point source is an industrial facility pumping fecal matter into a stream or river by an outflow pipe. Non-point source pollution refers to runoff, which can be harder to pin-point exact causal locations.

In addition, the North Fork watershed faces issues from runoff due to pet waste and turbidity from soil erosion into the River and its tributaries Not only does turbidity lead to health complications for the animals that live in the North Fork, but it also leads to the water becoming dark and murky which prevents plant growth on the River bed and cuts off oxygen from the surface for the animals in the water. Turbidity is also of concern to farmers as it can be an indicator of the loss of prime agricultural soils, which detract from the lands' agricultural vitality.

Infrastructure solutions have been discussed as partial remediation solutions. They range from green infrastructure, which could have positive impacts on both the economic vitality and water quality of the river (i.e. using river oysters or biochar, for example), to determining the best locations for amenities such as outdoor classrooms and walking/hiking/biking trails, to incorporating recreational businesses and linking the river to hiking trails on the mountaintop.

Safey is the unifying issue at hand with the North Fork as well as the entire Shenandoah River. While changes can be made in order improve River access, if water quality related issues are not addressed then individuals will not be safe to enjoy the River and may attribute to further diminishing the health of the River. Investing in infrastructure ensures the safety of River users and landowners.

Turbidity Examples
mrbdc.mnsu.edu


Cows And Children Sharing Water
washingtonpost.com

Two Men Rock Climbing In Shenandoah County

Stakeholders currently involved in developing the Master Plan include:

1. Friends Of The North Fork Of The Shenandoah River

2. Alliance For The Shenandoah Valley

3. Seven Bends State Park

4. Friends Of The Shenandoah River

5. Virginia Department Of Forestry

6. Shenandoah County Water Resource Advisory Committee

7. Lord Fairfax Soil And Water Conservation District

8. Virginia Department Of Game And Inland Fisheries

9. Virginia Tech Agricultural Extension Office

10. Town Of New Market

11. Town Of Mount Jackson

12. Town Of Edinburg

13. Town Of Woodstock

14. Town Of Toms Brook

15. Town Of Strasburg

16. Shenandoah County Office Of Community Development

17. Shenandoah County Office Of Economic Development and Tourism

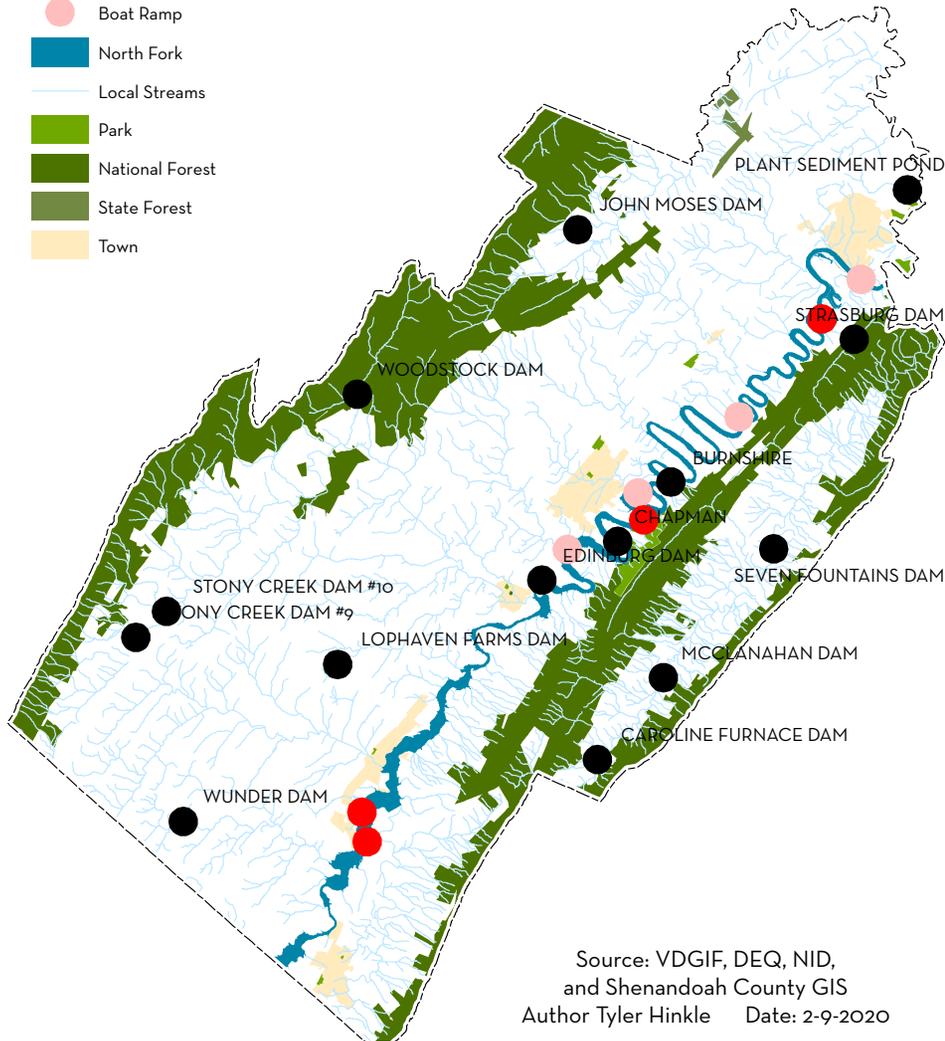18. Shenandoah County Office Of Parks And Recreation

The current process used to address conservation, clean-up, and improving access along the Shenandoah River involves various methods from different groups that are not coordinated with an overarching set plan or goals. There is potential to combine efforts to lead to greater results.
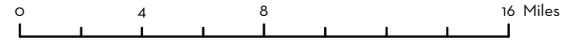
Shenandoah County
Existing Dam Conditions

N

0   4   8   16 Miles
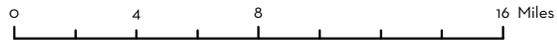
Legend

● Dam
● Hand Launch
● Boat Ramp
■ North Fork
  Local Streams
■ Park
■ National Forest
■ State Forest
■ Town

PLANT SEDIMENT POND
JOHN MOSES DAM
STRASBURG DAM
WOODSTOCK DAM
BURNSHIRE
CHAPMAN
EDINBURG DAM
SEVEN FOUNTAINS DAM
STONY CREEK DAM #10
STONY CREEK DAM #9
LOPHAVEN FARMS DAM
MCCLANAHAN DAM
CAROLINE FURNACE DAM
WUNDER DAM

Source: VDGIF, DEQ, NID,
and Shenandoah County GIS
Author Tyler Hinkle   Date: 2-9-2020

Shenandoah County
Existing Recreation Conditions

N

0   4   8   16 Miles

Legend

● Hand Launch
● Boat Ramp

Recreation

— Fully Supporting
— Insufficient Information
  Not Assessed
— Not Supporting
■ Park
■ National Forest
■ State Forest
■ Town
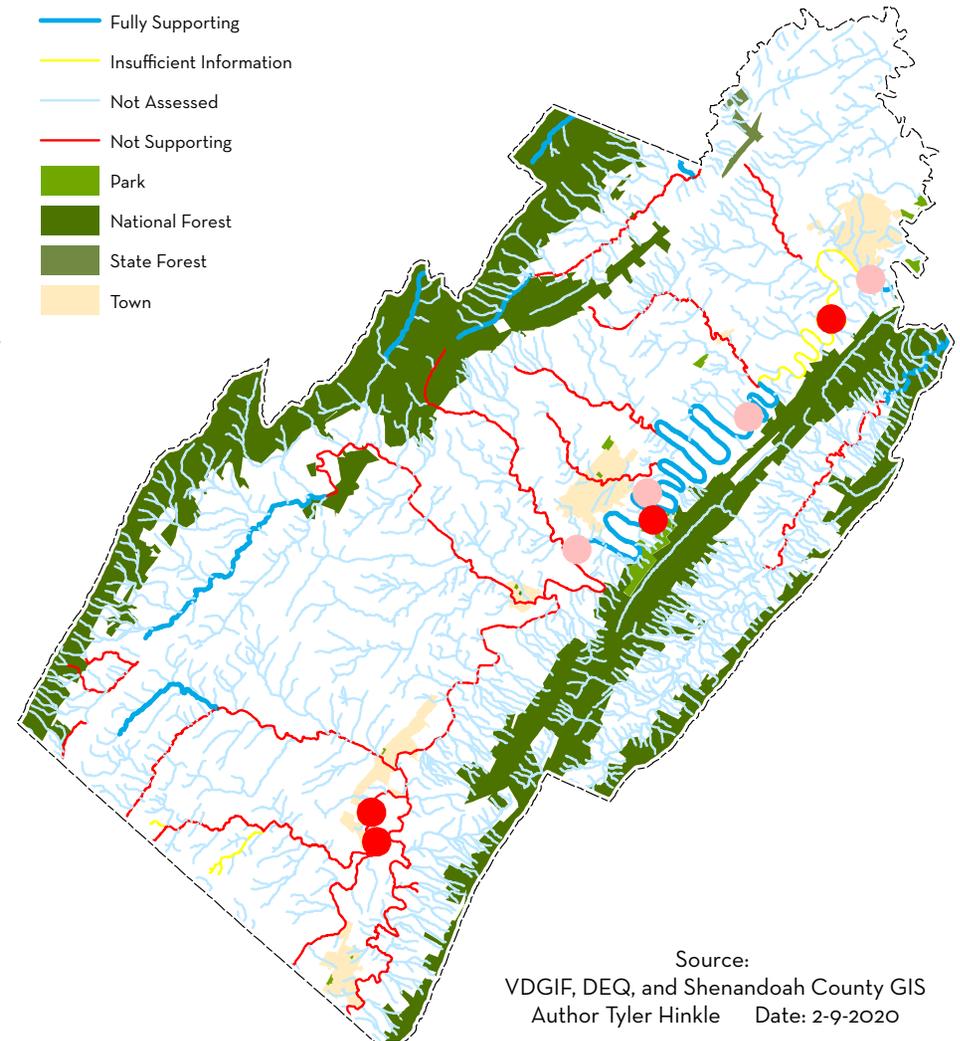
Source:
VDGIF, DEQ, and Shenandoah County GIS
Author Tyler Hinkle   Date: 2-9-2020
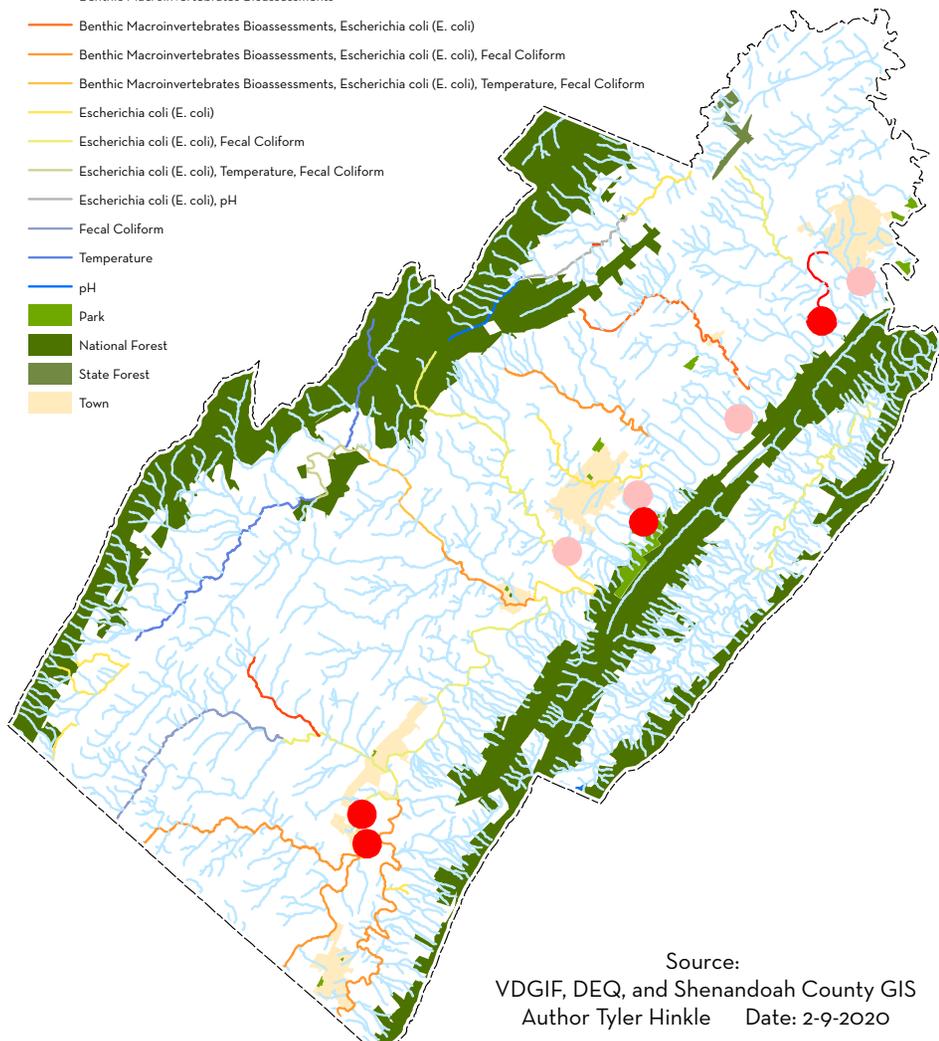
Shenandoah County Existing Quality Conditions

N

0   4   8   16 Miles

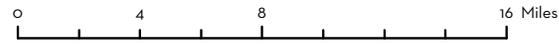**Legend**

● Hand Launch

● Boat Ramp

— <all other values>
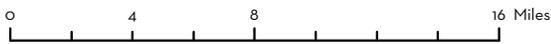
Impairment Cause

— Algae
— Benthic Macroinvertebrates Bioassessments
— Benthic Macroinvertebrates Bioassessments, Escherichia coli (E. coli)
— Benthic Macroinvertebrates Bioassessments, Escherichia coli (E. coli), Fecal Coliform
— Benthic Macroinvertebrates Bioassessments, Escherichia coli (E. coli), Temperature, Fecal Coliform
— Escherichia coli (E. coli)
— Escherichia coli (E. coli), Fecal Coliform
— Escherichia coli (E. coli), Temperature, Fecal Coliform
— Escherichia coli (E. coli), pH
— Fecal Coliform
— Temperature
— pH
■ Park
■ National Forest
■ State Forest
■ Town

Source:
VDGIF, DEQ, and Shenandoah County GIS
Author Tyler Hinkle   Date: 2-9-2020

Shenandoah County Existing Source Of Impairment

N

0   4   8   16 Miles

Legend

● Hand Launch

● Boat Ramp

Source Of Impairment

— Aquaculture (Permitted)
— Atmospheric Deposition - Acidity
— Atmospheric Deposition - Acidity, Wildlife Other than Waterfowl, Non-Point Source, Agriculture
— Industrial Point Source Discharge, Municipal (Urbanized High Density Area), Wildlife Other than Waterfowl, Non-Point Source, Agriculture
— Municipal (Urbanized High Density Area), Wildlife Other than Waterfowl, Non-Point Source, Agriculture
— Non-Point Source, Agriculture
— Source Unknown
— Wildlife Other than Waterfowl
— Wildlife Other than Waterfowl, Non-Point Source, Agriculture
— Wildlife Other than Waterfowl, Source Unknown, Non-Point Source, Agriculture
■ Park
■ National Forest
■ State Forest
■ Town

Source:
VDGIF, DEQ, and Shenandoah County GIS
Author Tyler Hinkle   Date: 2-9-2020

14

Shenandoah County Existing Fish Consumption Conditions

N

0   4   8   16 Miles

Legend

● Hand Launch
● Boat Ramp

Fish Consumption

— Fully Supporting
— Not Assessed
▬ Park
▬ National Forest
▬ State Forest
▬ Town

Source:
VDGIF, DEQ, and Shenandoah County GIS
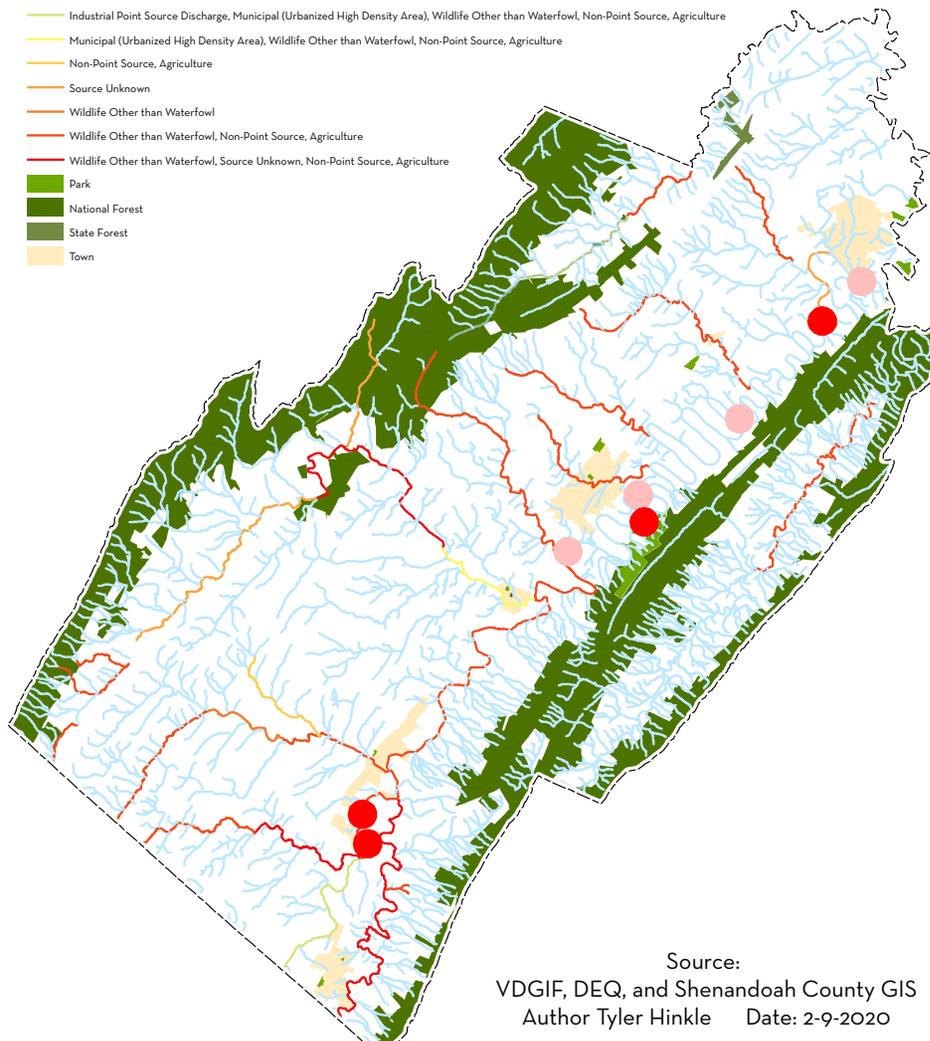Author Tyler Hinkle   Date: 2-9-2020

Shenandoah County Existing Aquatic Life Conditions

N

0   4   8   16 Miles

Legend

● Hand Launch
● Boat Ramp

AQUA_LIFE

— Fully Supporting
— Insufficient Information
— Not Assessed
— Not Supporting
▬ Park
▬ National Forest
▬ State Forest
▬ Town

Source:
VDGIF, DEQ, and Shenandoah County GIS
Author Tyler Hinkle   Date: 2-9-2020

15
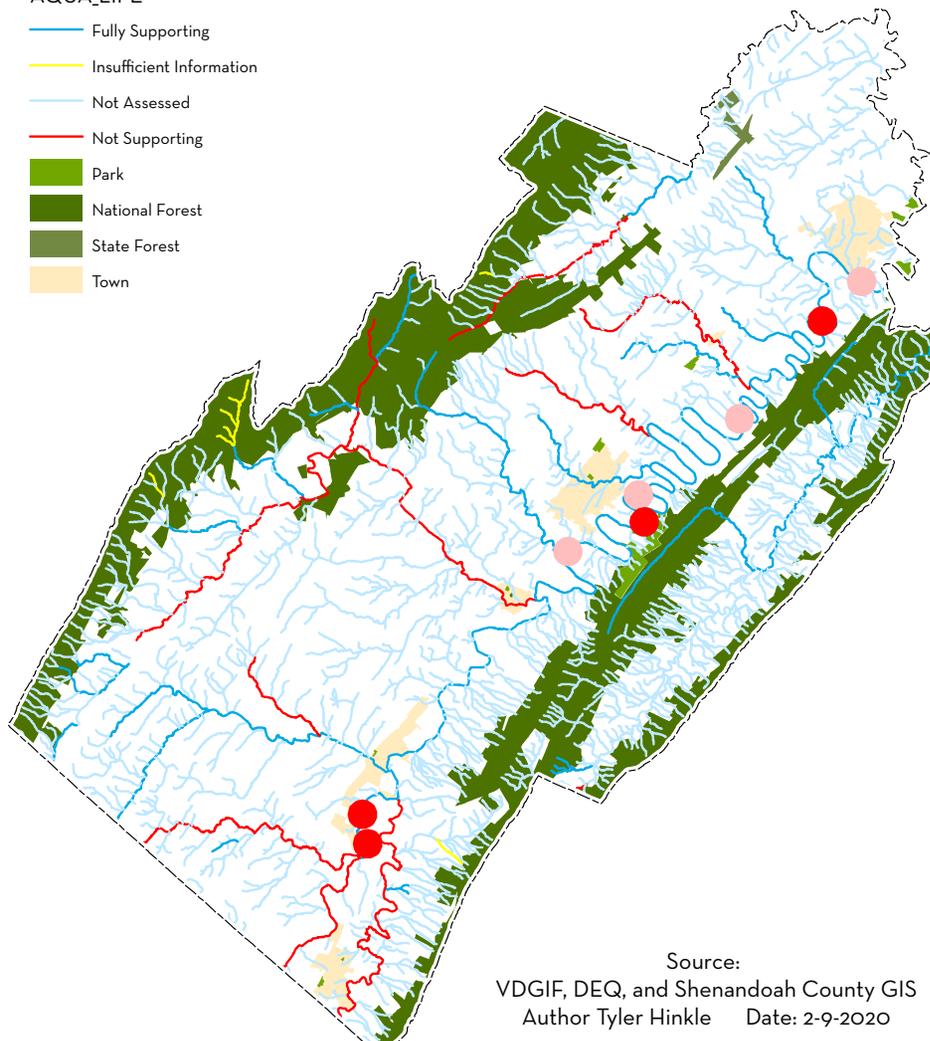
Shenandoah County Existing Public Water Conditions

N

0   4   8   16 Miles

Legend

● Hand Launch
● Boat Ramp

Public Water Supporting

— Fully Supporting
— Not Applicable
— Not Assessed
■ Park
■ National Forest
■ State Forest
■ Town
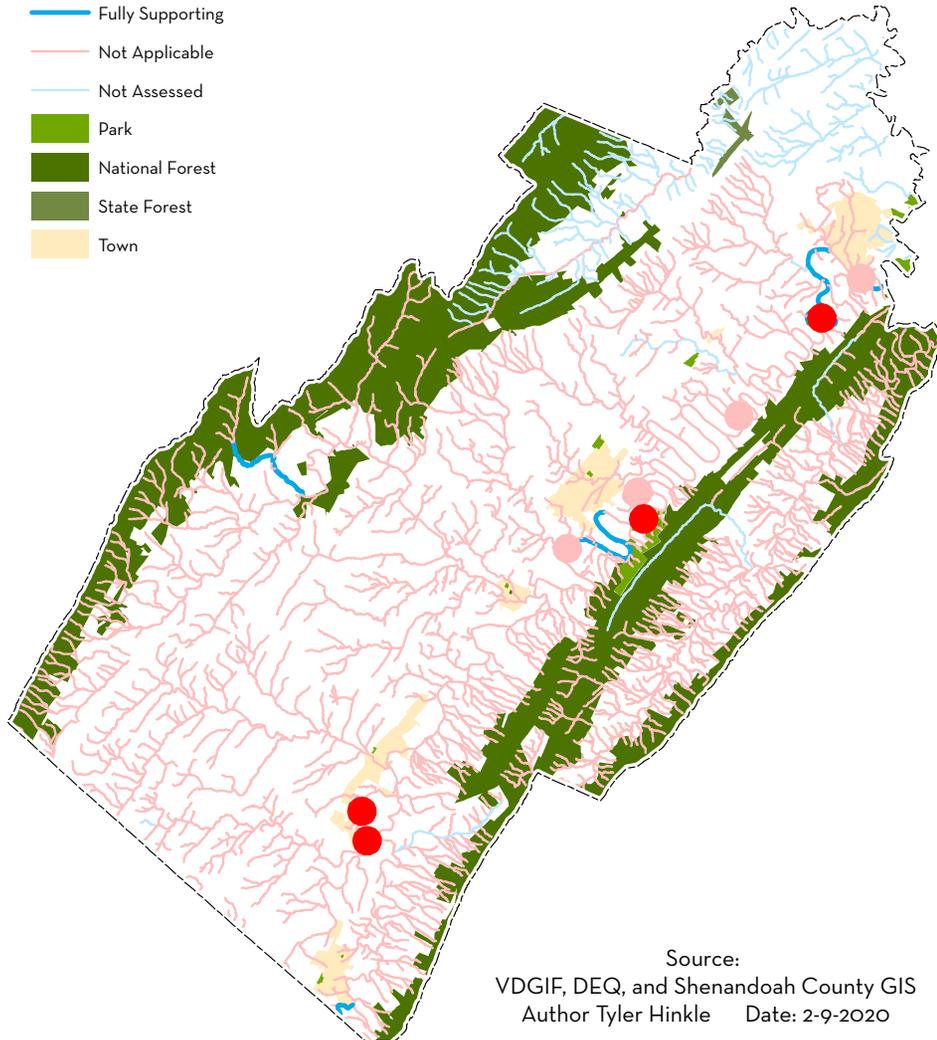
Source:
VDGIF, DEQ, and Shenandoah County GIS
Author Tyler Hinkle   Date: 2-9-2020
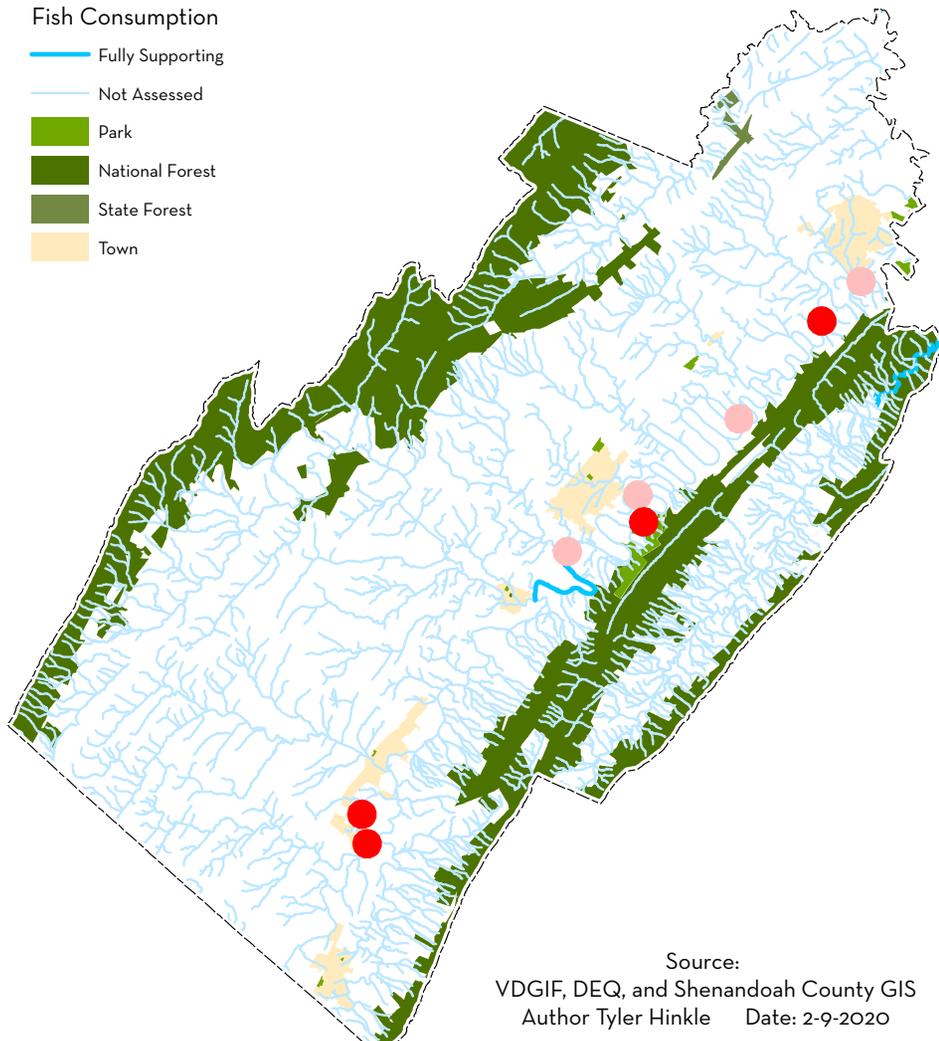
Shenandoah County Existing Wildlife Conditions

N

0   4   8   16 Miles
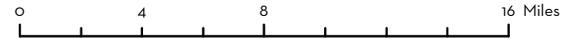
Legend

● Hand Launch
● Boat Ramp

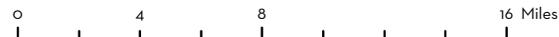### Wildlife Conditions

— Fully Supporting
— Not Assessed
■ Park
■ National Forest
■ State Forest
■ Town
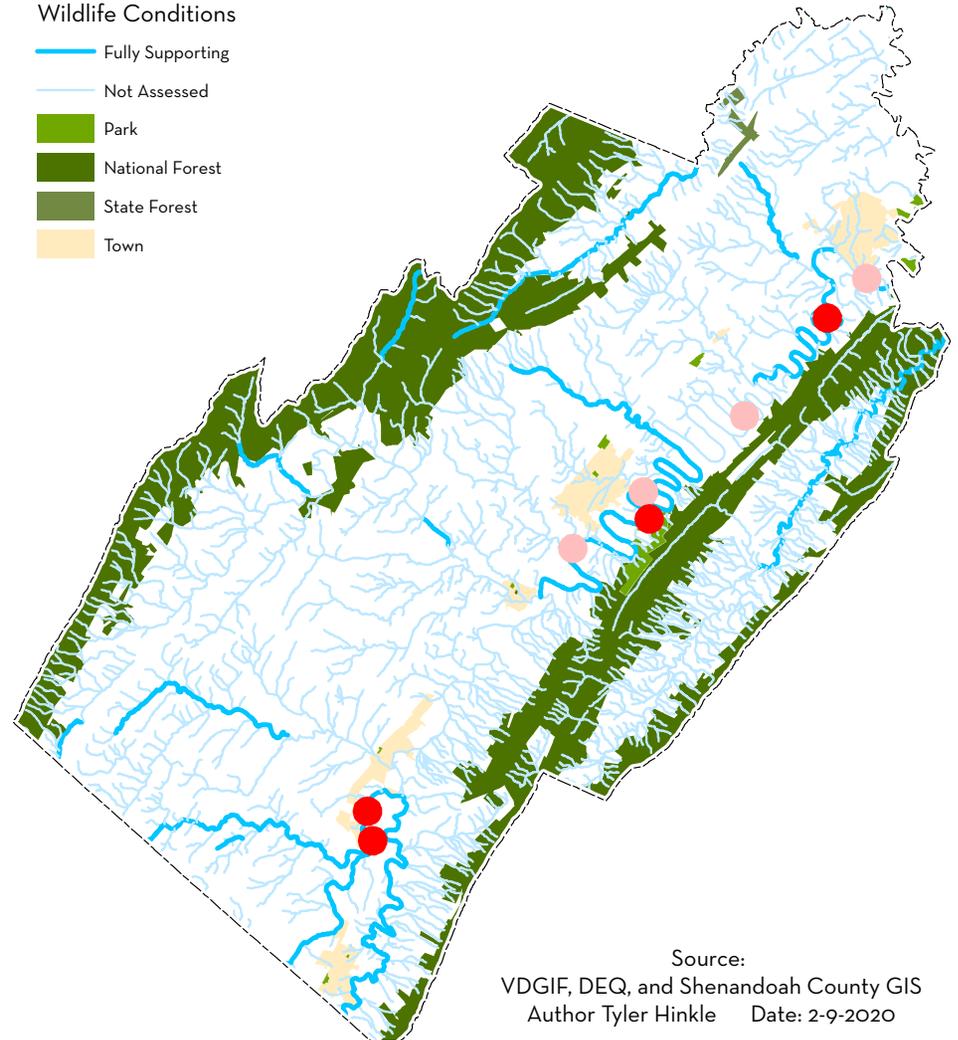
Source:
VDGIF, DEQ, and Shenandoah County GIS
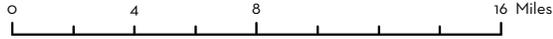Author Tyler Hinkle   Date: 2-9-2020

SECTION IV:
PROJECT PURPOSE AND GOALS

Our team seeks to provide Shenandoah County a model for equitable collaboration with all stakeholders, and recommendations on courses of action that can be taken to improve quality, access, and infrastructure based on community input.

Overall Goals & Objectives

1. Identify **key stakeholders** and their attachment to the watershed.

2. Determine **unknown assets** that could be leveraged for successful implementation.

3. Develop a set of "**best practices**" based on the successes and failures of other cities and counties who have faced or are facing similar issues, in order to assist Shenandoah County in developing their Master Plan.

4. Develop a set of **recommendations for equitable collaboration** to assist Shenandoah County in developing a Shenandoah River Master Plan in order to achieve greater water access, higher water quality, and better infrastructure, in the hopes that this can develop into a workable and replicable model that every other county in the watershed can look to in order to promote the protection of the entire watershed.

In order to better address these goals, our team also developed learning objectives for each of the main issues faced by the Shenandoah River. These are:

- Who are the **key stakeholder groups** and what about the river do they value most?

- What **types of landowners** exist on the water and how are their values and collaboration methods different?

- How do **individuals in public office** and with administrative power feel about the river?

- What steps could localities follow before implementing water projects to **ensure everyone can express their opinions**?

- What **collaborative approaches/frameworks** are most effective given the context?

- Can we develop a framework for updating and **monitoring adherence** to the master plan once its approved?

Access

- What **creative infrastructure solutions** have been utilized in other areas facing similar issues, and what has their success rate been, if known?

- What options are available in providing equitable **access to the river without creating a nuisance**, and which of these might be most cost effective?

Quality

- What are the sources of **water quality problems**, and what possible remedies exist to reduce pollution?

- What methods for **improving and incentivizing water quality are already being used** by groups in the area?

- What, if any, **additional methods could be used to incentivize** these water quality remedies?

- What **laws govern water quality**, or the river itself, and what, if anything, may need to change within the regulations to affect a meaningful change to the watershed?

SECTION V:
OPTIONS AND RECOMMENDATIONS FOR EQUITABLE COLLABORATION

In order to best address the issues of access, quality, and infrastructure, we draw on precedent examples and case studies of similar issues as they have occurred in other rivers both locally and across the globe. We draw on these precedents not only to develop the most appropriate model for equitable collaboration in Shenandoah which will be specific to the River's unique situation, but also to understand what viable options might be available to address each of the issues going forward.

ACCESS

Recommendations should ultimately be based on public input, however, we have included a list of commonly proposed recommendations that could be applicable to Shenandoah County. Considering the unique context of the North Fork and background research, the specific recommendations presented below encompass five major categories: financial, advertising, physical, educational, and policy. These actions have been proved successful throughout many similar situations.

Recommendations for Improving Access	
Financial	Establish a public water access grant fund for the purpose of acquiring, improving and maintaining waterfront recreational property.
Advertising	Increase marketing of current access points.
Physical	Create more boat launches.
	Interconnect water trails to bike trails.
	Maintain up-to-date signage and information within information kiosks.
	Develop portage sites around existing dams as well as leverage the dams for recreational moments.
Educational	Provide area Chambers of Commerce and other partners with informational materials that advertise water-based recreation opportunities in the area.
	Provide river safety and responsible use education.
Policy	Investigate if/how the process of obtaining access easements can be streamlined.

Access Precedent & Justification

Hiwassee River Watershed Recreational Access Plan (HRAP)

The Hiwassee River Watershed Coalition (HRWC) developed the (HRAP) as an effort to identify and prioritize improvement projects that expand opportunities for citizens to access natural resources. The Hiwassee River Watershed Recreational Access Plan can serve as a **model for engaging the public** in the planning process for improved access. Similar to Shenandoah County, until this project was initiated, every river within the project area had an 11+ mile area where no official public access existed. Local residents were concerned with safety and trespass problems, but also the limited access to the river.

The **first phase** of the project included background research on the stakeholders and access to the natural resources. This phase also consisted of obtaining input from agencies on priority areas and investment strategies within the project area. The **second phase** focused on public outreach and input. Information was gathered through public meetings (24 participants), personal communication and coordination of an online 12-question survey (82 participants).

At each meeting, a presentation was given describing the purpose of the project and the current state of access in the watershed. After the presentation, there was an **open discussion** regarding access points. **Phase three** included the analysis and conclusions from the study. Recommendations were based on HRWC's priorities, agency priorities, public input, and the existing uses and assets. Recommendations were then **ranked** on a low, medium, high scale.

Factors Influencing Final Recommendations

Hiwassee River, Tennessee
Hrwc.net

Greater Des Moines Water Trails and Greenways Plan

The Greater Des Moines Water Trails and Greenways Plan included a Greater Des Moines Water Trails Community Engagement report which detailed the extensive and meaningful community participation process. The public engagement process included a **survey, focus groups, and community events**. In total, 341 people participated in the paper-based survey, 335 participated in the online survey and 180 participated in focus groups. 12 public events were also held to help build excitement and collect data for the water trails planning initiative.

What makes this project notable is the **thought or sensitivities** these facilitators showed throughout the processes. As an effort to improve rural input, they mailed invitations to farms and collaborated with Iowa State Extensions, Iowa Soybeans Association, and Heartland Area Co-op and Farm Bureau. Recognizing the distrust in government many minority communities feel, the facilitators **developed partnerships** with immigrant and minority community leaders to ask for additional survey input. Special interests were also recognized throughout the analysis of the data. Concerns and interests were broken down by race, age, and gender to ensure that all interest group's input was valued.
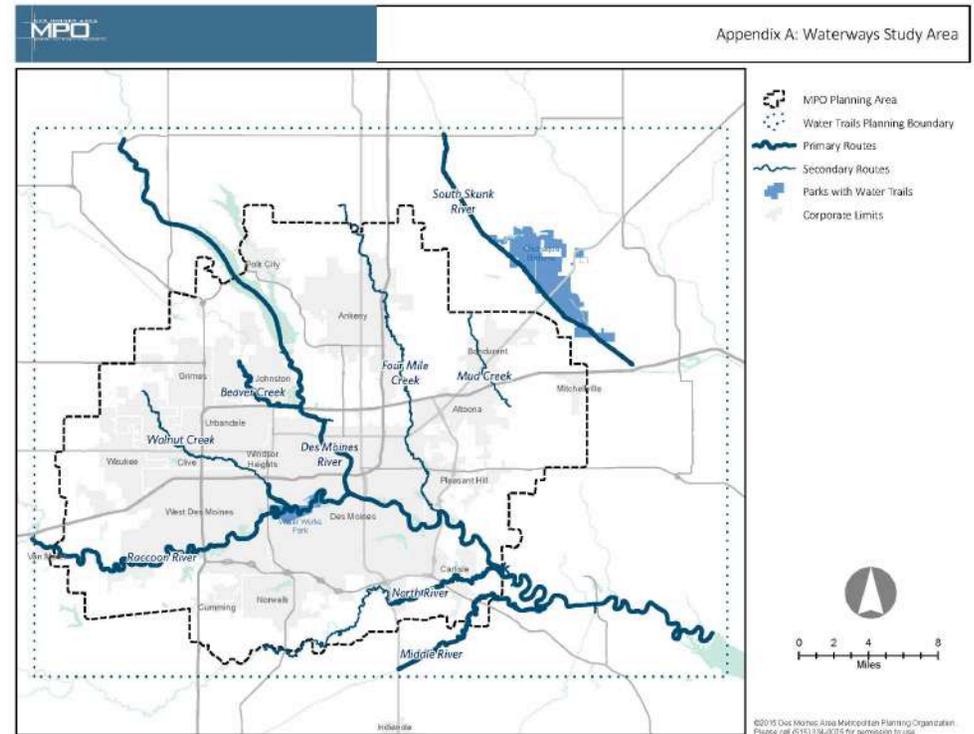
Overview Map Of Des Moines Plan
Dmampo.org

The Dam Plan Of Des Moines, Iowa
Polk-swcd.org

The River Ring Of St. Louis

In 1994, St. Louis 2004 was formed in order to bring a **renaissance** to the metropolitan region. More than 10,000 individuals were asked two questions: how should St. Louis **build upon its assets to improve the region's quality of life**, and how should the region celebrate the centennial of the 1940 World's Fair and the bicentennial of the Louisiana Purchase. Proposition C was one of 11 priorities for the region, and it was the need for **clean water, safe parks, and community trails**. Proposition C was put to public vote and in November 2000, 68 percent of voters supported it. The vote created what is now The Great Rivers Greenway District which began to work with the Metro East Park and Recreation District in Illinois in order to ensure the maximum regional benefit. Their public report points to three major outcomes of an interconnected system: **Economic Development, Social Capital, and Environmental Stewardship**. In order to show that such a project is feasible they demonstrate four case studies: Boston's Southwest Corridor, Denver's Cherry Creek Greenway, Minneapolis' Chain of Lakes, and Portland's Williamette Greenway.

The process involved a 36-member Citizen Advisory Committee that represented the St. Louis Metro Area, which allowed for residents to give their public input on the communities desires with the project. The project identified nine ways that the project could benefit their community: **physical development, education, social connectivity, accessibility, aesthetics, economic, preservation, health, and pollution deterrence**. Through the process the participants were able to identify the assets and liabilities, in addition to their priorities and criteria for actions that should be taken for implementation.
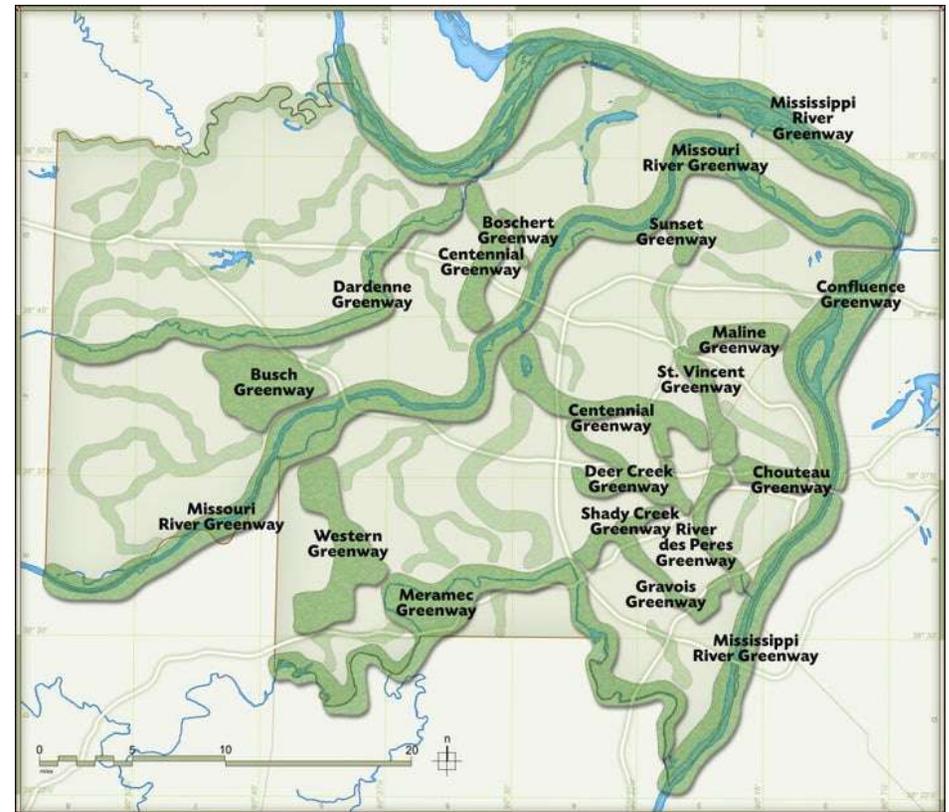
Map Of The River Ring Of St. Louis
Greatriversgreenway.org

Clinch River Valley Initiative (CRVI)

The Clinch River Valley Initiative included collaborative efforts to understand the need for **greater river access**. This initiative created an "Access Points Action Team" that identified best practices. One of the best practices suggested by the team included prior research on the wildlife present at each site location. After selecting the communities desired locations for new access points, localities should consult with the Virginia Department of Conservation and Recreation (DCR) and the Virginia Department of Game and Inland Fisheries (DGIF) to ensure that a proposed location **will not create any unacceptable risks to wildlife**. The CRVI public access committee group also suggested that new access points be located approximately a **two hour or less canoe float away** from the next upstream and downstream access point. The team also recommends that a few **access point locations should be in towns**. This will help **encourage spending** at local businesses. The team also highlighted that each public access location should have **space for at least one large truck or van** with a boat hauling trailer to enter and exit the location safely. Not only is this necessary for boaters to access the river, but it also ensures that emergency vehicles will be able to reach people more efficiently. This initiative resulted in many more best practices for improving access that should be included throughout the Shenandoah River Master Plan.

Clinch River Merchandise
Clinchriverva.com
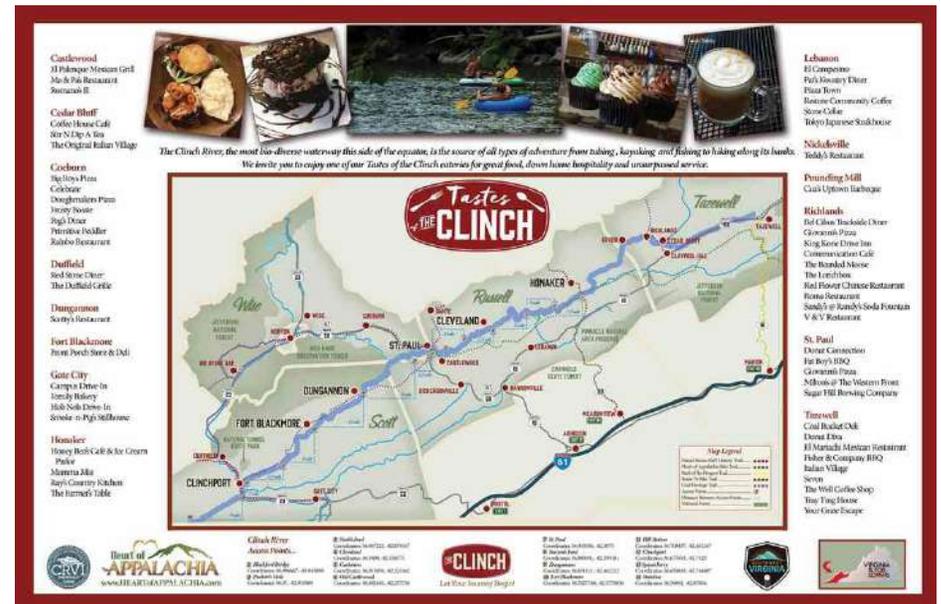
Taste The Clinch Promotional Material
Timesnews.net

Barton Dam Portage Improvement

The Huron River Watershed Council (HRWC) developed an innovative approach to the concern of providing portage for non-motorized floation devices around the Barton Dam in Ann Arbor, Michigan. HRWC consulted with a design team with Smith Group JRR in order to develop, "the **first-of-its-kind boat slide**, a stainless steel railing that makes portaging a canoe or kayak across the dam as easy as lifting it up on the rail and gliding it up or down the dam." (HWRC.org) HRWC plans to use this design as a model for additional portage improvements along the Huron River Water Trail as well as other rivers in the state. The Huron River Water Trail runs 104 miles and has **waterproof maps for navigation**, as well as an **online interactive map** at huronriverwatertrail.org/explore.

Wildcat Creek Portage Improvement

The Wildcat Creek Guardians earned a $5,000 grant to install a **125 foot gravel trail** along Wildcat Creek. They were able to succeed in their efforts not just because of the grant, but also because a **local landowner donated an acre** of land for them to use, a dozen volunteers aided in preparing the land, and **Sunbelt Rentals donated** the rental of two Bobcats which saved the Guardians $2,000 in costs. As shown to the right the portage trail begins over a 100 feet from the dam, and at the site of the dam the group installed a **concrete launch pad**.

Portage Rack   Kiosk Stand In Town   Handicap Access Device

huronriverwatertrail.org

Portage Path   Portage Pad

kokomotribune.com

Roaring River Dam Removal
lrn.usace.army.mil

Iowa's Department of Natural Resources provides saftey reosurces for dams.
www.iowadnr.gov/things-to-do/canoeing-kayaking/low-head-dams

Pine River Dam Reuse

While some communities turn to removing dams entirely like Roaring River pictured above, others reuse the dam as moments for recreation as seen with Pine River. The pool of water produced by its dam was tranformed into not just a pool for the local community, but also **tiered seating for picnics and performances**. There may be potential for r**epurposing some dams**.

Siltcoos River Portage Site
canoetour.org/siltcoos-river-8th-of-august/

Pine River Minnesota Dam Transformation
pinerivermn.com

Quality

In order for a collaborative process to be successful in addressing the specific types of pollutants in the River, it is critical that all pollutants be measured and addressed as they will vary at different points along the River's path. Unique solutions to cleansing the river of each pollutant must be found. To first address the quality impairments the river is facing, we sought to understand the depth and breadth of methods available for decreasing both point and non-point source pollution. The following case studies address best practices and methods for diminishing impairments similar to those of the Shenandoah River. We then collected and evaluated potential methods of collaboration for addressing such impairments.

Quality Precedent & Justification

York County

Various Pollution Reduction Techniques

York County, located in the Tidewater region of Virginia, also faced the need to **combat pollution** as part of an effort to reach goals set by the Chesapeake Bay TMDL. Specifically, York County **reduced nitrogen loading by 4 million pounds** from streams and waterways throughout the county. In their solution, York County provides a blueprint for how to effectively use a variety of techniques to combat this sort of pollution and **implemented riparian buffers and livestock stream crossings** on farm. In addition York County invested in **stream restoration projects** (restoring stream channels and reconnecting to the floodplain) in both urban and agricultural areas. Pollution reduction techniques included **tree planting** to increase canopy coverage, the introduction of **bioswales and forest buffers, wetland restoration, implementation of infiltration basins and bioretention/rain gardens, Stormwater Performance Standards** (for Stormwater treatment and runoff reduction), **Urban stream restoration**, and the creation of a **nutrient management plan**, among others.

York County set as its first priority the need to create "a coordinating entity that would identify priority locations for improvement, fund projects, and monitor water quality to identify and quantify improvement." They then implemented a **community engagement plan** which ensured transparency and involvement at each and every step in the process. Drawing on resources such as the existing coalition of clean water groups, which included agriculture, stormwater, municipalities, non-governmental organizations, the County Conservation District and other interests, the York County Planning Commission lead bi-weekly meetings open to the public. The County created a mailing list for all stakeholders who wished to get involved or remain apprised of the situation. Finally, York County understood the need to remain **trauma-informed**, emphasizing that the plan would call for voluntary actions by all stakeholders. To be trauma-informed means to be aware of and to adknowledge past traumas in a community which can prevent collaboration. The resulting plan thus included three major strategies which were then converted into action items for each stakeholder group. The strategies were:

1. Collect efforts already on the ground and not credited

2. Determine how to reach compliance with their local area goals

3. Develop actions to meet compliance and surpass it

The James River

Low Impact Development & Integrated Stormwater Management

The James River, which courses through the heart of Richmond, Virginia, also had severe issues relating to nitrogen, phosphorus, and other sediment runoff pollutants. Algal blooms and dead zones along the river were all too common, and as such a proposal to the Governor recommended **Low Impact Development** (LID) strategies, and **Integrated Stormwater Management** as two viable solutions to clean up the pollution in the James. These approaches were targeted solutions in order to protect the James from runoff, reduce the risk and impacts of flooding, and increase the water supply. As such, these solutions can also become viable options for other localities as well.

James River Richmond, Virginia
Srmfre.com

The Hudson River

Dredging

Beginning in 1947, General Electric used polychlorinated biphenyls (PCBs) in their manufacturing process, and up until 1977, were discharging the PCBs into New York's Hudson River. This point source pollution caused severe damage to the river ecosystem and water quality. In addition, the Hudson River has faced mercury pollution and the discharge of untreated sewage, creating a 'perfect storm' of river quality pollutants which ultimately led to the designation of the Hudson River as a Superfund site in 1984. By 2001, the river was contaminated with over 100,000 pounds of PCBs.

The solution to this contamination took a two-fold approach over many years. First, to **raise awareness** about the river, Pete and Toshi Seeger founded "**Hudson River Sloop Clearwater**." in 1966. They employed the use of a one masted sailboat, in order to educate residents and visitors alike as to the Hudson's history and to the necessity for environmental success in the area. Then, in 1991, the EPA conducted a ten year study on PCB pollution in the Hudson. The study concluded in 2001 and the EPA proposed **dredging** the River, starting with the most contaminated sites. Over 2.6 million cubic yards of polluted sediment was dredged and disposed of as a result of this plan.
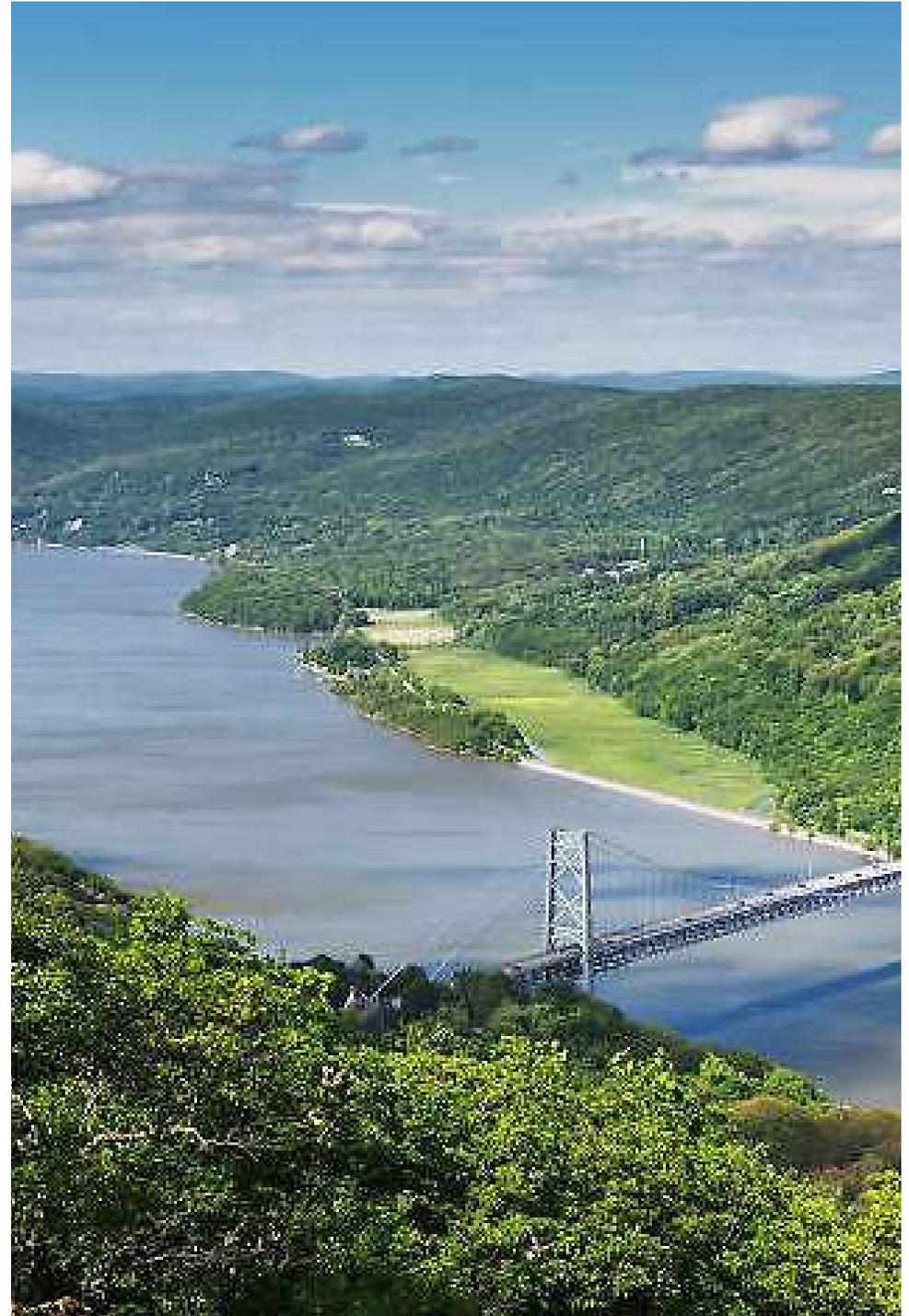
Hudson River, New York
Timeout.com

Approaches to Collaboration For Quality

Our group assessed and compiled a variety of methods of community collaboration surrounding river impairments were then assessed and compiled. The following precedents describe the various approaches to collaboration that could be taken in light of current concerns. As each community faces their own challenges surrounding their histories and their perspectives, both Boston and San Antonio provide a perspective in how different communities can move past former tensions between groups. The Elizabeth River's River Star program offers a unique collaborative pollution prevention strategy, and the Lancaster Clean Water Partners program provides a strategy for group organization, agenda-setting, and impact. Finally, the Pennsylvania Pilot Counties program showcases a valuable planning process used to achieve results both locally and regionally which serves as a model for how Shenandoah County can be a model for the rest of the watershed.

Boston has recently faced the need for increased stormwater management and flood prevention, and recognizes that this will only increase with the ongoing threat of climate change. As such, the city developed the **Climate Ready Initiative**. One of the first major outcomes of the initative was the "Coastal Resilience Solutions for East Boston and Charlestown," published in October 2017. Boston created a framework for equitable collaboration that can be adapted to address Shenandoah River quality.

Boston's collaborative protocol brought together a **wide range of stakeholders**, including representatives from both city and state government, neighboring cities, city planning, neighborhood associations, architects, landscape designers, engineers, and urban planners and designers to garner a range of professional input which would yield the best designs for the rising tides. The city also notably **solicited input from over 400 city residents** for the plan. Within the report, a series of stunning renderings and detailed descriptions outline a number of **"near term" and "long term" solutions**, and is thus careful to aim solutions toward addressing predicted coastal flood levels for 2030 and 2050-2070 respectively. Seven criteria - **Effectiveness, Feasibility, Design life & Adaptability, Social Impact, Equity, Value Creation, and Environmental Impact** - were used to evaluate design ideas and recommendations for both the near

and long term and to compose the final list of solutions. These solutions are thus similar in nature but differ mostly in scale of implementation.

Both consideration of the scale of solutions, as well as creating objective criteria for evaluation were thus proven to be important aspects of any large scale collaborative process.

Getting The Kids Involved With Clean Up Efforts
Environmentmassachusetts.org

San Antonio, Texas

When beginning a collaborative process it is always recommended that stakeholders approach the issues at hand on **equal footing** with a process that ensures that each stakeholder group feels that they are an equally valuable voice in the process. However in practice, most all contentious issues are so **highly fraught with emotion** that any effort toward collaboration begins with less than equal stakeholder input. This was true of the City of San Antonio, until they addressed the tensions and implemented a collaborative process worthy of recognition. Although the city did not specifically face water quality issues, their collaborative approach to highly contentious water quantity concerns is thus of great note.

Specifically, when attempting to address the significant low water levels in the Edwards Aquifer as mandated by a federal court judge, San Antonio was at a standstill, wherein the citizens were distrusting of the government and industry, and where legal methods were being used as a way for citizens to attempt to have their voices heard. It was not until the stakeholder groups agreed to mediation that a true collaborative process began to unfold. San Antonio's collaborative effort began with city council **agreeing to study all ideas** and to create a public process for using the results of scientific research to develop the plans further. The stakeholder groups then agreed to a set of eight criteria by

which each plan would be evaluated. This took the emotional tensions out of the decision-making process, and placed the stakeholder groups on equal footing such that they then could move forward and feel able to voice their concerns with any particular plan properly.

Blanco State Park Outside Of San Antonio In Blanco, Texas
Sanantonio.culturemap.com

Elizabeth River

In 1983 the Elizabeth River was singled out by the Environmental Protection Agency (EPA) as one of the most polluted bodies of water in the entire Chesapeake Bay watershed. While the watershed is still listed as impared, the community has organized for action in order to prevent future pollution as well as clean up the current conditions of the River. The process began in November of 1991 with a conversation over a kitchen table that led to the formation of the organization, which became incorporated two years later. Following their first Watershed Action Plan in 1996, they achieved their first wetland restoration and launched the River Stars Program for industries.

The **River Star Program** seeks to engage businesses and industries, and since 2011 it also engages homeowners and schools in the best actions they can take to not only prevent pollution, but also help clean up the current conditions of the watershed. Their website at elizabethriver. org/river-stars provides three options for becoming a River Star and lists the requirements for each designation. For businesses there are three different levels of commitment based on the level of accomplishments achieved in the fields of pollution prevention and **wildlife habitat enhancement and protection**. In order to receive a designation the business or industry must document the progress that they have made.

River Star Schools are school or youth organizations that implement projects in pollution prevention or habitat enhancement. The projects that the students implement can be small and take a day, or long and take all year to complete. **Schools commit at the start of the school year** and around April 21st they turn in summaries of their projects to be reviewed for decisions on awards to be made. Some examples of projects are **water monitoring, recycling, eco-art, journaling, clean-ups, outdoor classrooms**, in addition to many more.

To be recognized as a River Star Home and receive a flag to put in their front yard, homeowners only need to agree that they will do seven actions:

1. **Scoop The Dog Poop**

2. **Reduce Lawn Fertilizers**

3. **Only Rain In The Storm Drain**

4. **No Grease In Your Sink**

5. **Help Geese Migrate - Don't Feed Them**

6. **Avoid Single-Use Plastics**

7. **Don't Flush Medicines**

In addition to the methods that are suggested, the River Star Homes Program provides **funding for rain gardens, rain barrels, and plants to help with shoreline restoration**.

This is possible through having a revolving fund which can be used to help with implementation projects.

In order to help with promoting a cleaner watershed the community is broken up into civic leagues which work within themselves collaboratively, while at the same time collaborating with all other civic leagues in order to promote actions for a healthier watershed.

This model works within their Watershed Action Plan which is reworked every ten years in order to reassess their situation and determine the major actions that should be focused on in order to improve the quality of the watershed. This is done in a collaborative process with community meetings that will typically involve food to make up for the time that individuals are contributing to the meetings. Currently their major actions are:

- **Keep the goo going!** - This focuses on the clean up of the contaminated bottom of the Elizabeth River so that the known hotspots are able to reach non-toxic levels.

- **Achieve sustainable development and redevelopment practices.** - This action requires collaboration between the government, citizens, and businesses in the area.

- **Restore resilient natural shores.** - This action seeks to improve and recreate wetlands, oyster reefs, and
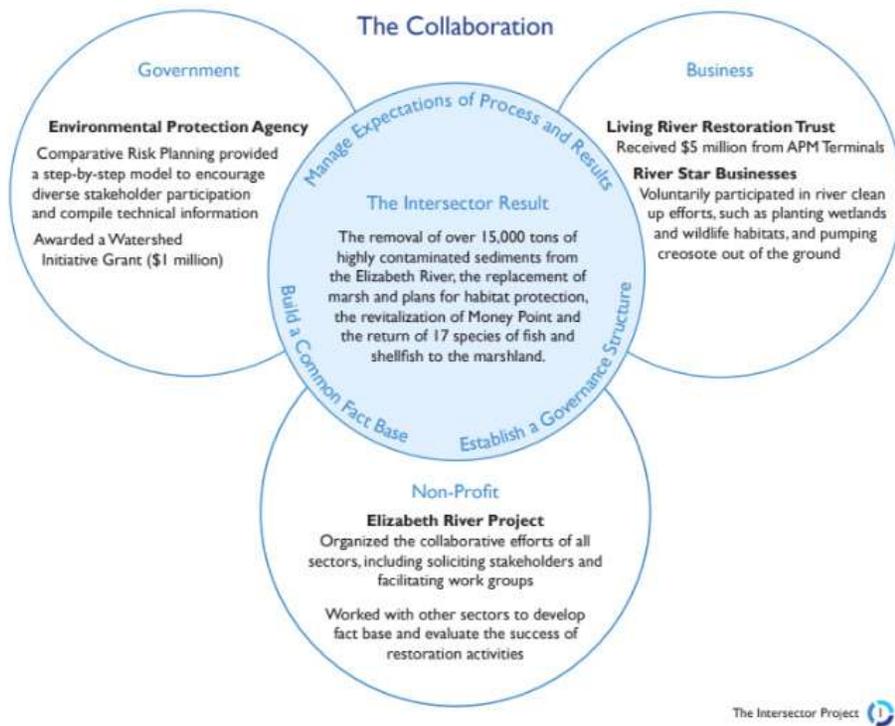
The Collaboration Model
Elizabethriver.org

reforest banks in the watershed area in order to provide habitats for wildlife.

- **Restore clean water** - This action is to find and fix the sources causing the highest levels of fecal indicator bacteria, while also reducing nutrients in the water.

- **Create a river revolution** - 25,000 citizens of all ages and backgrounds lead this effort to bring others to understand, embrace, and promote the restoration of the Elizabeth River.

To help demonstrate the impact that the Elizabeth River Project has had on the community they also publicly list the five major restoration projects that they completed with Money Point, Paradise Creek, Lafayette River, Living River, and the Eastern Branch.

Showing Off A New River Star Home Flag
Elizabethriver.org

Lancaster Clean Water Partners Program

The Lancaster Clean Water Partners (LCWP) is a program under the Lancaster Conservation Foundation (LCF), which was formed in 2007 in order to help fundraise for the Lancaster Conservation District (LCD). The LCWP seeks to achieve collective impact in order to leverage assets together with multiple partners at the table in order to achieve clean water along with as many players at the table as possible. Lancaster points to their unique situation in having important agricultural land, as well as urban spaces in the same locality and that these assets need to be leveraged together in order to find and fuel nuanced solutions to environmental challenges. In addition to breaking up the watershed geographically with each of the different smaller watersheds in the County, the LCWP breaks down its organization according to the chart on the right. This chart demonstrates that while the Executive Committee and Steering Committee remains relatively constant, the system of Stakeholders and Partners remains open in order to bring more people to the table. In order for any individual, organization, business, agency, or institution to become a partner they must embrace the LCWP vision, goals, and operating procedures, and are not required to pay fees or dues to join.

Partners must commit to:

- Share information disseminated by the Partnership with their respective members or peers;

- Provide input to the Steering Committee on ways the Partnership goals can be attained;

- Be publicly listed as a partner;

- Collaborate in a constructive manner with other partners;

- And support the consensus-based decision making process that the LCWP follows.

Collaboration Models
Lancastercleanwaterpartners.com

The collective impact process is used by the LCWP in order to unite multiple efforts under one Common Agenda. The process for developing the Common Agenda can be seen to the right as it allows for perceived problems to go through a collaborative process before a solution is determined. To give an example the LCWP problem is that, "more than half of Lancaster County's 1,400 miles of streams suffer from poor water quality due to sediment and nutrient pollution." Their vision is to have the **streams clear and clean in their generation**. Their mission is to coordinate efforts and expand the impact of their partners in improving the health and viability of local streams. The solution is to build and sustain local cross-sector collaboration, with a strong backbone organization supporting it, and to advance the Common Agenda toward a shared result, with the result being clean and clear water in their generation.

The LCWP also has 17 metrics that are used to measure success across different aspects of the project. In order to promote action and progress the Program has six different action teams: **agriculture, buffers, data management, communication, stormwater, and watersheds**. The teams must meet at least once a quarter and the leads must meet bi-monthly in order to check-in and promote full collaboration.

In addition the Program has a **publicly available mapping** service which helps to show the different conditions of each of the smaller watersheds, which make up around 600 acres each, in order to inform the public and help with planning efforts. The website makes the point to state that the data alone should not be used to make decisions as, "results should be ground-truthed using local knowledge through stakeholder and landowner participation."

To help grow and further develop the number of leaders in the community the Program offers the Watershed Leadership Academy, which is a 12 month long program that involves field investigations, an overnight retreat on the Chesapeake Bay, 10 single day sessions that include field components, and five self-selected electives hosted by partner organizations throughout the year. The fee is $300 and there are courses offered every year.

To further grow public knowledge of the work being done and the data that is gathered the Program holds an annual Water Quality Monitoring Data Summit. This provides for a public space for data dissemination as well as collaborative thinking based on the data at hand. The website also directs visitors to sources of funding as well as success stories in order to help motivate as give individuals the necessary tools to start implementing change.

Pennsylvania Pilot Counties Program

Lancaster County also played a key role in being one of four different counties selected by the Pennsylvania Chesapeake Bay Watershed Implementation Plan Steering Committee for a collaborative process of seeking to reach their nutrient pollution reduction targets.

The following is the planning process that was used in order to achieve collaboration:

1. Have diverse team with members countywide;

2. Select a team leader;

3. Define goals to accomplish alongside water quality goals;

4. Identify local, regional, state, and national resources to meet goals;

5. Determine and report appropriate actions to meet identified goals, and plan implementation;

6. Set up an Implementation Team to ensure implementation and reporting of results.

Each county was asked to share their local planning process, ask other counties questions, and share challenges, lessons learned, and recommendations for a more effective process. Below is a compilation of each County's findings:
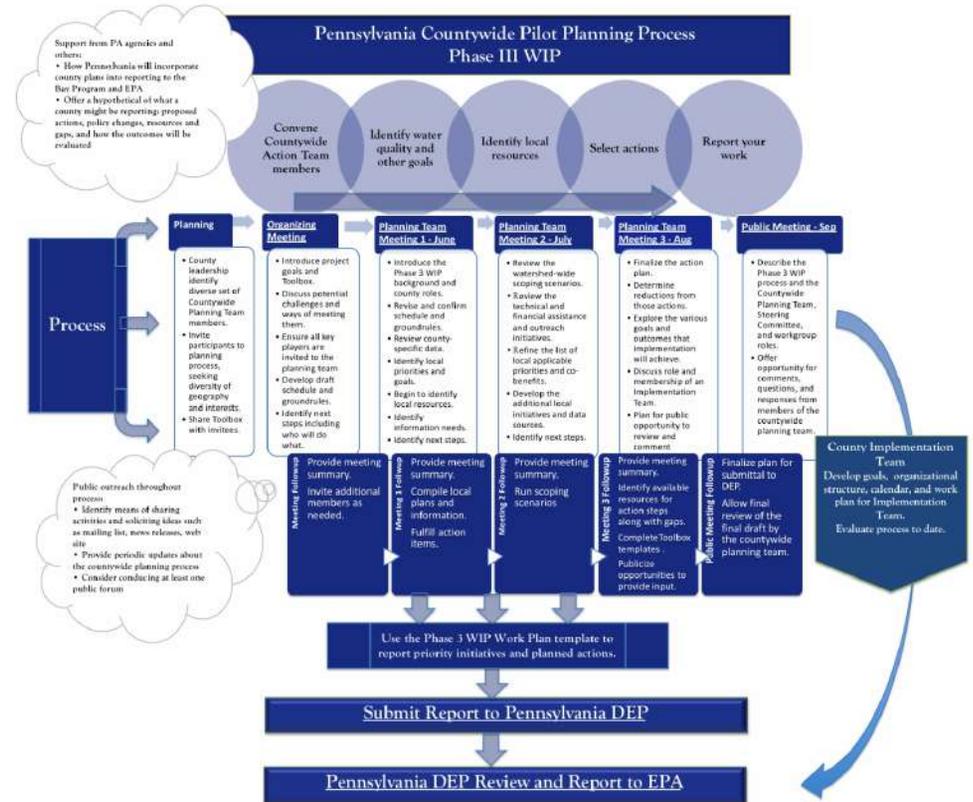
Collaboration Model
Dep.pa.gov

	York County	Lancaster County	Franklin County	Adams County
Process	- Bi-weekly meetings -Mailing list with all stakeholders involved -Toolbox process -Start with big strategies then move to small projects -Three fold strategy: 1- Collect efforts on the ground not credited 2- Reach compliance 3- Meet the gap in order to go above and beyond compliance	- Clean Water Partners (CWP) is the coordinator - Bi-weekly meetings - Google Drive for sharing - Data compliation - Interviews and conversations with stakeholder groups to gauge mission and feedback - Have six main areas of focus	- Planning Commission takes lead - No formal organization for clean water - Education is important - Where can data be reached and how to know what is not reported? - Better communication and awareness across agencies is needed	- SRBC and ICPRB are involved - Need scenarios to use for initial engagement meeting - Have good tracking of BMPs on the ground - Represent all municipalities at the kickoff meeting - Need to capture everything being completed - First stakeholder meeting needs to educate the group about the WIP
Opportunities / Challenges	- Integrate existing efforts - Achieve compliance - Capture existing credit activities - Get practices on the ground - Bridge communication gap - Costs to WIP process - Private landowner permission	- Accessibility of info - Timeframe - Pressure is key - Tons of customized data - Right team members - Ag community buy-in - Connect with PA wide efforts and messaging - Cultural barriers - Stressful - Who provides oversight, and how to track?	- No existing entity - Educational process - Identify lots of questions and data - Need to engage more stakeholders, including homeowners - Find the data and know what is reported - Better communication across agencies, build awareness	- No existing entity - Effort will be an education tool - This is a lot to do in a short time - Want to engage AG community - Worries of if it will mean anything
Lessons Learned	- Landowner participation - Toolbox helpful - Process works - Compliance isn't a given	- Openness and transparency - Value of good record keeping -Value of asking lots of questions - Benefit to breakdown content areas and give timeline - Main goal is Lancaster's local waters resonates better - Looking for, "Big Idea" opens more doors - Regulation can prevent ideas from being feasible - Need tools	- There are a lot of practices on the ground not captured - Lots of homeowners are doing good things	- Starting with information out by educating stakeholders

Given the success of the above projects and methods, the following lists some overall recommendations for both the access and quality impairments the North Fork is currently facing.

Access

Access Engagement Process Recommendations	
Situation Assessment	Create a survey
	Tally visitors and produce quarterly and annual summary reports. Conduct trend analysis on visitor statistics
	Speak to community members to determine past and current traumas related to River access and usage.
Advertising	Create presentation explaining the goals of the project and summarizing the current quality of river access.
	Advertise the project through bulletins (especially at the river's current access points), radio, and social media. Investigate most used social media within the community to decide platforms.
	Hold public meetings and public events to generate knowledge and support for the project.
Outreach	Reach out to minority community leaders and organizations that have historically provided services and done outreach to minority populations within the community

Quality

Shenandoah County should survey the issues of water quality faced by each of the stakeholders in the stakeholder groups as well as their understanding of the necessity and importance of a complete water quality clean up solution(s). In addition, gather information from all types of stakeholders and community members on the current and past traumas in relation to improving the quality of the North Fork of the Shenandoah River and its tributaries. There should be an understanding of who has been hurt, is being hurt, and is concerned they will be hurt by any changes.

Request several representatives from each of the stakeholder groups to come together in monthly meetings to create a set of criteria which will enable the group to evaluate all quality improvement plans for the area objectively in order to create a brave space under which they may discuss this potentially contentious topic. In addition the stakeholders that are identified should be included in development review processes to ensure that the watershed is not further impaired so that all future development works in tandem with the proposed Master Plan for the North Fork of the Shenandoah River.

Using the criteria agreed upon, evaluate all ideas brought forward through the case studies as well as those offered by the stakeholder and science groups. If multiple ideas pass the evaluation criteria equally, take those ideas to the stakeholder group most impacted for a vote on which idea is most preferred. A list of the criteria and methods of engagement should be gathered from all agencies, groups, and individuals who currently work with landowners and communities so that a cohesive approach to landowners and communities can be developed. This criteria should not just apply to River or watershed improvements, but also to greater improvements for the environment in order to ensure that all of the natural resources in Shenandoah County are invested in.

Understanding Our Shared Values

In order to improve the chances of collaboration this chart demonstrates a general overview of the shared values that different current, possible, and unactivated stakeholders have. It was found that local politicians and public members of Government support improvements along the River as long as there is a sound plan and the ability to offset or not incur the costs of the projects.

Family

Families, Family Reunions, and Groups For Children And Family Related Groups.

Faith

Churches, Places of Worship, Baptisms, Burials, and the Importance of Water to Faith

Farming

Farmers, Local Food Sellers, Small Family Farmers, 4-H, FFA, And Farmers Coop.

Non-Profits

Ruritans, Rotary, American Legion, Water Groups, Non-Water Groups, And PTAO's.

Recreation

Tourists and Locals, Hikers, Bikers, Swimmers, Hunters, Fishers, Kayakers, and Tubers.

Government

Each Town Representative, County Representative, E911, And State Represenatives.

Home Owners

Suburban, Urban, and Rural Homeowners On And Off Water, Renters On And Off Water.

Commerce

Small Sandwich And Fly Shops, Downtown Businesses, Wineries, And Lumber Producers.
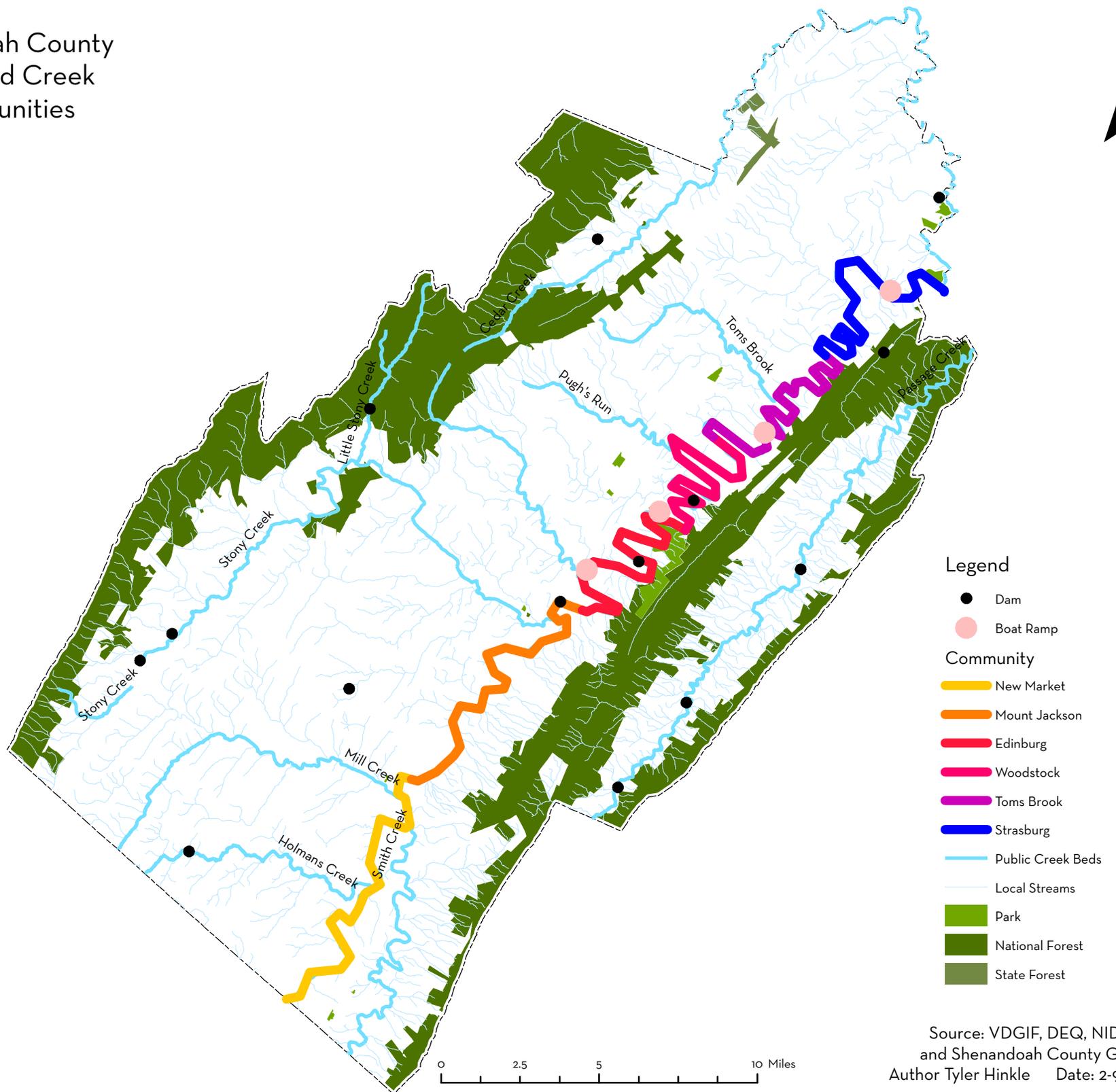
River And Creek Communities

David Brotman, Director of the Friends of the North Fork of the Shenandoah River (FNFSR) has suggested the concept of looking at organizing identity along the North Fork based on the part of the watershed that individuals lived nearest to rather than identifying with the entire watershed. Based on Virginia State code section § 28.2-1200 and the information from the US Army Corp Of Engineers, there are ten different creeks in Shenandoah County that classify as public creek beds. In addition to the ten different creek communities, there are nearly 76 miles of the North Fork of the Shenandoah River within Shenandoah County. In order to both connect people with the part of the watershed close to where they live and to existing communities that can be build off of, this report breaks the North Fork into six sections, with each section having a little over 12 river miles. Expanding on this model there are fifty-nine possible Stream communities to increase action by connecting individuals to a more local level. While this report only calls for coordination led by Shenandoah County for the six river and ten creek communities, there is a possibility for stream communities to unite on their own through a set of guiding documents laid out by key agencies and individuals in the development of the Master Plan. Page 44 demonstrates a map of all the communities and the following is a list of possible local watershed communities:

River Communities	Creek Communities
New Market	Smith Creek
Mount Jackson	Holman Creek
Edinburg	Mill Creek
Woodstock	Stony Creek
Toms Brook	Narrow Passage Creek
Strasburg	Toms Brook
	Cedar Creek
	Little Stony Creek
	Pugh's Run
	Passage Creek

Stream Name	Location	Stream Name	Location
Alum Run	Orkney Springs	Mikes Run	Conicville
Anderson Run	Orkney Springs	Mill Run	Toms Brook
Bakers Run	Mountain Falls	Millers Run	Woodstock
Barb Run	Orkney Springs	Mine Run	Toms Brook
Bean Run	Orkney Springs	Mountain Run	Hamburg
Bear Run	Orkney Springs	Mud Run	Conicville
Beetle Run	Orkney Springs	Mulberry Run	Middletown
Buck Run	Rileyville	Paddy Run	Mountain Falls
Bull Run	Orkney Springs	Painter Run	Edinburg
Cedar Spring Run	Strasburg	Peters Mill Run	Rileyville
Cold Spring Run	Mountain Falls	Poplar Run	Wolf Gap
Cove Run	Woodstock	Pughs Run	Toms Brook
Crooked Run	Conicville	Riles Run	Conicville
Dry Run	Rileyville	Rinker Run	Orkney Springs
Edinburg Run	Edinburg	Rocky Run	Wardensville
Eishelman Run	Middletown	Saltpeter Run	Orkney Springs
Falls Run	Conicville	Shell Run	Mountain Falls
Foltz Creek	Jerome	Snapps Run	Toms Brook
Fowlers Run	Toms Brook	South Fork Tumbling Run	Toms Brook
Gap Creek	Mount Jackson	Spruce Run	Wolf Gap
Hockmans Run	Mountain Falls	Stickley Run	Middletown
Hollow Run	Toms Brook	Straight Run	Conicville
Honey Run	New Market	Swamp Run	Middletown
Indian Run	Middletown	Swover Creek	Conicville
Jordan Run	Toms Brook	Town Run	Strasburg
Kelly Run	Orkney Springs	Tumbling Run	Toms Brook
Laurel Run	Conicville	Turkey Run	Middletown
Liberty Run	Edinburg	Yellow Spring Run	Wolf Gap
May Spring Run	Wolf Gap		

Shenandoah County River And Creek Communities

N

Cedar Creek

Toms Brook

Pugh's Run

Little Stony Creek

Passage Creek

Stony Creek

Stony Creek

Mill Creek

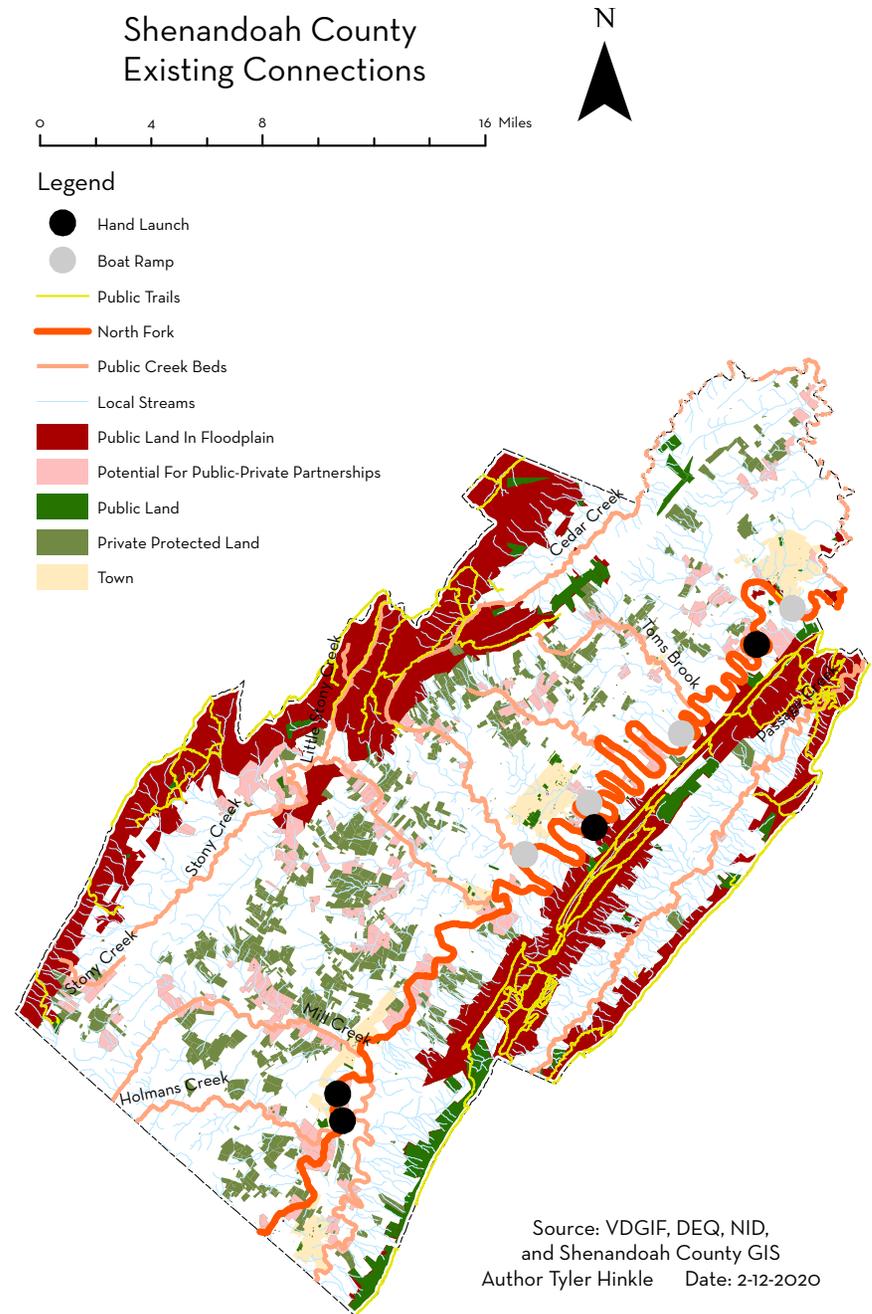Smith Creek

Holmans Creek

Legend

● Dam

● Boat Ramp

Community

━━ New Market

━━ Mount Jackson

━━ Edinburg

━━ Woodstock

━━ Toms Brook

━━ Strasburg

━━ Public Creek Beds

── Local Streams

▇ Park

▇ National Forest

▇ State Forest

0   2.5   5   10 Miles

Source: VDGIF, DEQ, NID,
and Shenandoah County GIS
Author Tyler Hinkle   Date: 2-9-2020
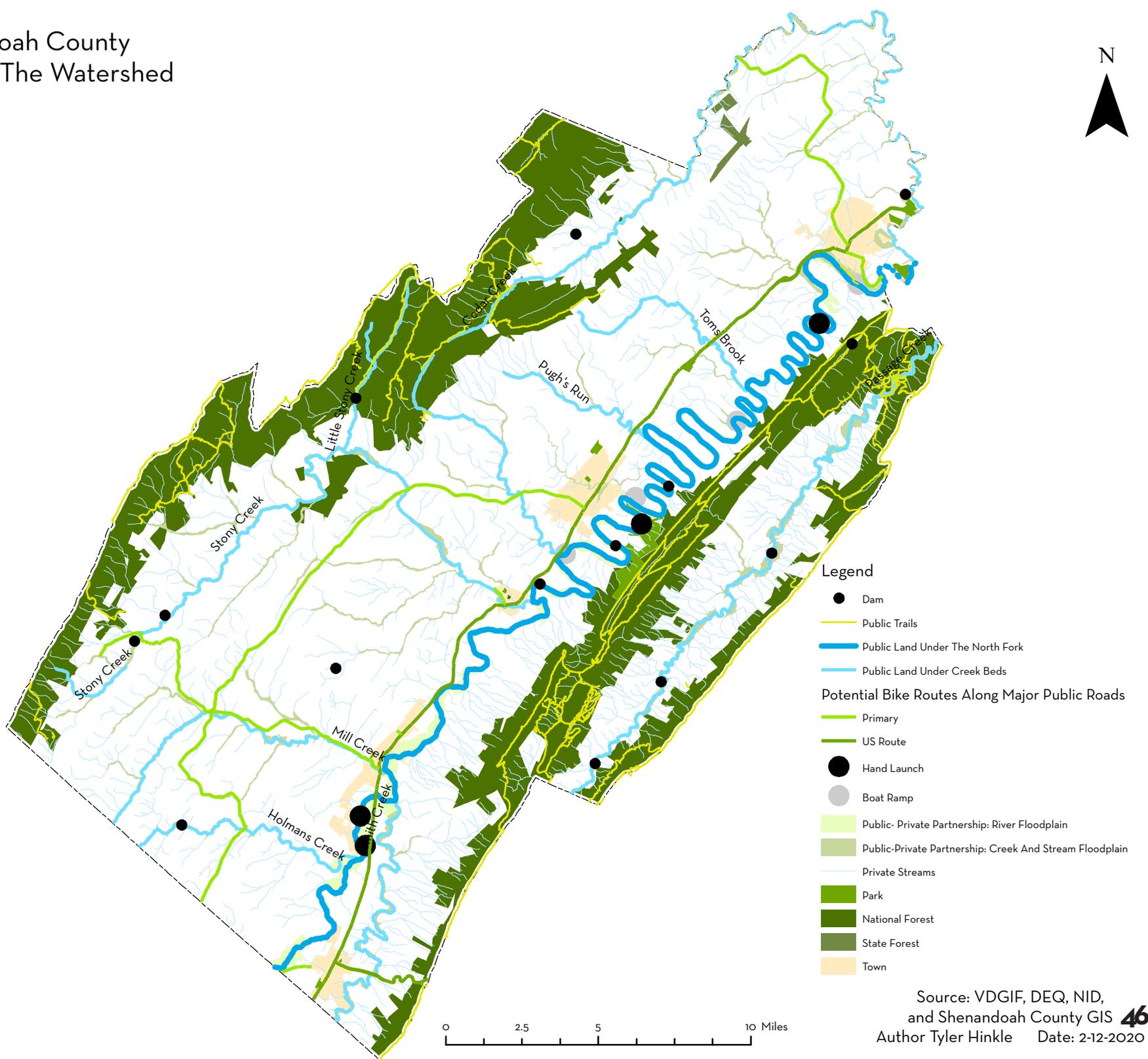
44

Connecting The Watershed

This proposal seeks to suggest that Shenandoah County and its community partners examine investing in starting an initiative in order to work towards greater access and mobility across the watershed for users of various backgrounds. The map to the right demonstrates the existing conditions of publicly owned properties, as well as possible public-private partnership properties which could expand the access to the watershed.

As stated at the start of this report, Virginia State code section § 28.2-1200 outlines the North Fork of the Shenandoah River as being owned by the public, in addition based on guidelines from the US Army Corp of Engineers there are ten different creeks that are owned by the public as well. This does not limit other streams from being considered public as the code section covers all perenial streams. With this determination the water is legally stated to be of public use, yet private ownership still runs on the land along the water as it is considered trespassing once someone crosses the vegetation on the banks of the River.

If Shenandoah County and its partners were to work towards easements and small purchases of property in the floodplain then the acreage of public water could increase to 20,432.2. This could be combined with promoting quasi-public access with private ventures and bike routes on public roads.

Shenandoah County Existing Connections

N

0   4   8   16 Miles

Legend

- ● Hand Launch
- ● Boat Ramp
- — Public Trails
- — North Fork
- — Public Creek Beds
- — Local Streams
- ▮ Public Land In Floodplain
- ▮ Potential For Public-Private Partnerships
- ▮ Public Land
- ▮ Private Protected Land
- ▮ Town

Source: VDGIF, DEQ, NID,
and Shenandoah County GIS
Author Tyler Hinkle   Date: 2-12-2020

Shenandoah County
Connecting The Watershed

N

Legend

● Dam

━━ Public Trails

━━ Public Land Under The North Fork

━━ Public Land Under Creek Beds

Potential Bike Routes Along Major Public Roads

━━ Primary

━━ US Route

● Hand Launch

● Boat Ramp

Public- Private Partnership: River Floodplain

Public-Private Partnership: Creek And Stream Floodplain

Private Streams

Park

National Forest

State Forest

Town

0   2.5   5   10 Miles

46

Map labels: Cedar Creek, Little Stony Creek, Stony Creek, Stony Creek, Mill Creek, Holmans Creek, Smith Creek, Pugh's Run, Toms Brook, Passage Creek

SECTION VI:
PROCESS EVALUATION PROTOCOL

In order to evaluate the success of this equitable collaboration protocol that the Shenandoah River chooses to implement, the following questions should be asked and addressed at each step in the process when applicable:

- Were all stakeholder groups identified and invited to participate?

- Was time taken to address and note current and past traumas from all perspectives in the community?

- Did every member and each stakeholder group have a voice throughout the collaboration process?

- Did every member feel that the space was brave enough for them to speak up?

- Were ideas discussed in a non-confrontational way?

- Did members of the group understand the higher ground to which they were called?

- At the conclusion of the process, did most, if not all, members feel satisfied with the approach agreed upon?

- Here, a three finger test for consensus should be used here to assess the satisfaction of individual members. The scale is as follows:

  - 1 finger = Blocking consensus

  - 2 fingers = Alright with group recommendation

  - 3 fingers = Fully supportive of group recommendation

- If two approaches were equally viable and supported by the group, were those most directly affected by the decision (riverfront property owners, farmers, etc.) able to choose their preference?

We recommend that a paper survey is developed for individuals to take after collaborative meetings are held so that there can be a measure of the effectiveness of the meetings. In addition, meetings should be held within the communities that are taking part in the discussion as this will allow for a closer connection to the land and water. There can be meetings held at neutral sites such as the Shenandoah County Administration Building, yet we recommend that such meetings revolve around the need to have certain technology or presentation space available as most discussion should occur within the communities. In addition, after meetings a brief period should be given for reflections so that individuals who participated can state what worked well, and what did not in order for the next meeting to go smoother and cause less disruption for participants. A summary of the discussions held should be kept in order to allow new members and participants to be included on past discussions. In addition, there should be time given to breath and take a break between discussions, with some food and drinks to aid in retaining a amicable space.