Little Conemaugh River AMD Cleanup

ECONOMIC IMPACT ANALYSIS

Cambria County, PA October 5, 2018

ECONOMIC AND REAL ESTATE ANALYSIS FOR SUSTAINABLE LAND USE OUTCOMES™

This study was completed for the Foundation for Pennsylvania Watersheds (FPW), a supporting organization of the Community Foundation for the Alleghenies.

www.pennsylvaniawatersheds.org
www.FPWgrants.org

9697 Loop Road
Alexandria, PA 16678

Board Members
Brian Hill
Mike Kane
Neil Korostoff
Scott Roberts
Andrew McElwaine, Ex Officio

Foundation for Pennsylvania Watersheds

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BACKGROUND

Purpose: Overview

Foundation for Pennsylvania Watersheds (FPW) commissioned this study to better understand the economic benefits of watershed restoration. FPW has a primary focus and interest on abandoned mine drainage mitigation, and has an extensive funding history within the study area. FPW is a nonprofit supporting organization of the Community Foundation for the Alleghenies, and focuses on watershed restoration. Since its inception in 1994, it has invested $12 million to leverage nearly $140 million in local, state, and federal project dollars. FPW was instrumental in the 2006 reauthorization of the Abandoned Mine Lands Fund (AMLF), which resulted in $6 billion in federal legislation to address coal mining's legacy. Pennsylvania was awarded $1.4 billion through the life of the reauthorization that will sunset in 2022.

Pennsylvania has benefited greatly from FPW's policy work, which resulted in additional mine reclamation funding starting in 2016. FPW's Executive Director John Dawes testified in Congress before the House Energy and Mineral Resources Committee on June 7, 2017 to describe FPW's role in Pennsylvania's mine reclamation program. Under the Consolidated Appropriations Act of 2016 (HR 2029), the Abandoned Mine Land Reclamation Fiscal Year 2016 Economic Development Pilot Program (AML Pilot) was enacted. This legislation provided Pennsylvania with an additional $30 million in restoration funding. Subsequent funding in 2017 and 2018, infused another $25 million per year into the state's restoration account (totaling an additional $80 million). As a requirement to receive AML Pilot funds, eligible grantees must prove an 'economic nexus.' Traditionally, this has been quantified in the form of job creation. This study intended to inform the potential of job creation within the watershed, as it relates to abandoned mine drainage mitigation.

Additionally, on August 23, 2011, FPW was named the benefactor of $3.5 million in settlement funds (GenOn). The GenOn funds were in response to a settlement for violations of the Clean Water Act, and were authorized for expenditure within the Kiski Conemaugh River Basin. This watershed has an extensive, mining legacy. Spoil piles, AMLF Priority I and Priority IIs, and abandoned mine drainages have not only impacted the water quality, but also the Basin's economy. Johnstown is the largest city within he Basin, and has a Pennsylvania Act 47 Distressed Community designation.

Purpose: Overview (Continued)

In 2012 FPW, announced a request for proposals that encouraged watershed groups to implement projects within the Basin. FPW provided $1.0 million in funding. After entertaining the small grants, FPW engaged local, state, and federal partners in developing a comprehensive strategy to leverage large- scale funds; $2.2 million was reserved to support a large-scale initiative with the Pennsylvania Department of Environmental Protection's Bureau of Abandoned Mine Reclamation (DEP BAMR).

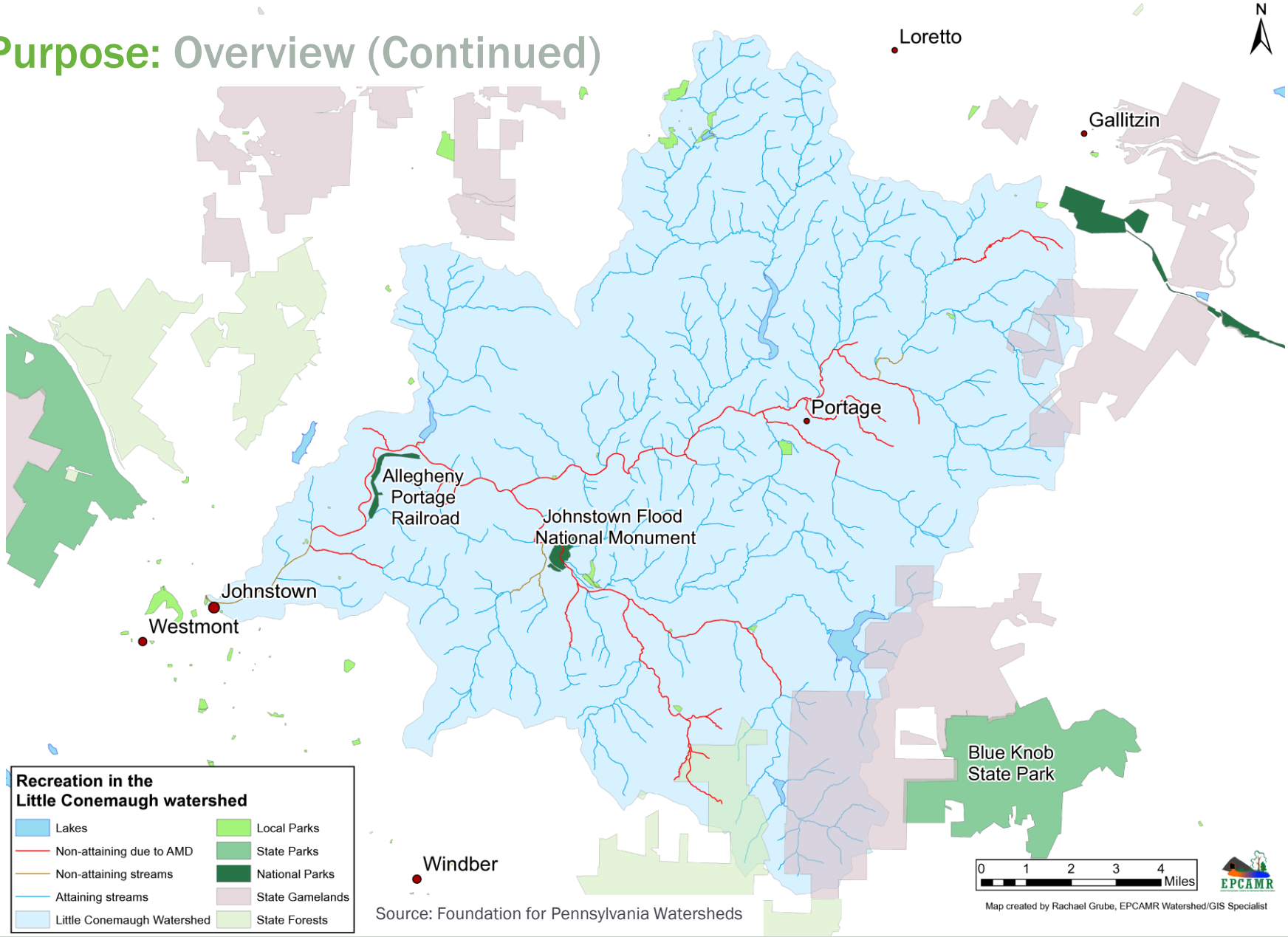
The basis for this strategy was the Super 7 Discharge Report (presented in the Appendix), which outlined the most damaging discharges within the 190 square mile Little Conemaugh watershed. Located in the eastern portion of the Kiski-Conemaugh River Basin and adjacent to the Stonycreek watershed, the Little Conemaugh watershed has nearly 30 miles of streams with many non-attaining due to abandoned mine drainage (AMD). Currently, fishing in the watershed is limited to the north Branch, the headwaters of the South Fork, and a handful of feeder streams.

According to the report, these seven discharges presented in the table below account for 89 percent of the pollution within the Little Conemaugh watershed. The report was completed in 2007, and little traction was made prior to the development of the Conemaugh Strategy Group. FPW facilitated meetings with funders, partners, and agencies. Tours were coordinated so that group participants could understand the project's magnitude. The Office of Surface Mining Control Reclamation and Enforcement (OSMRE) agreed to provide the group with technical resources that would help them understand the effects of treating the discharges, and help map the mine complexes.

Super 7 Facts

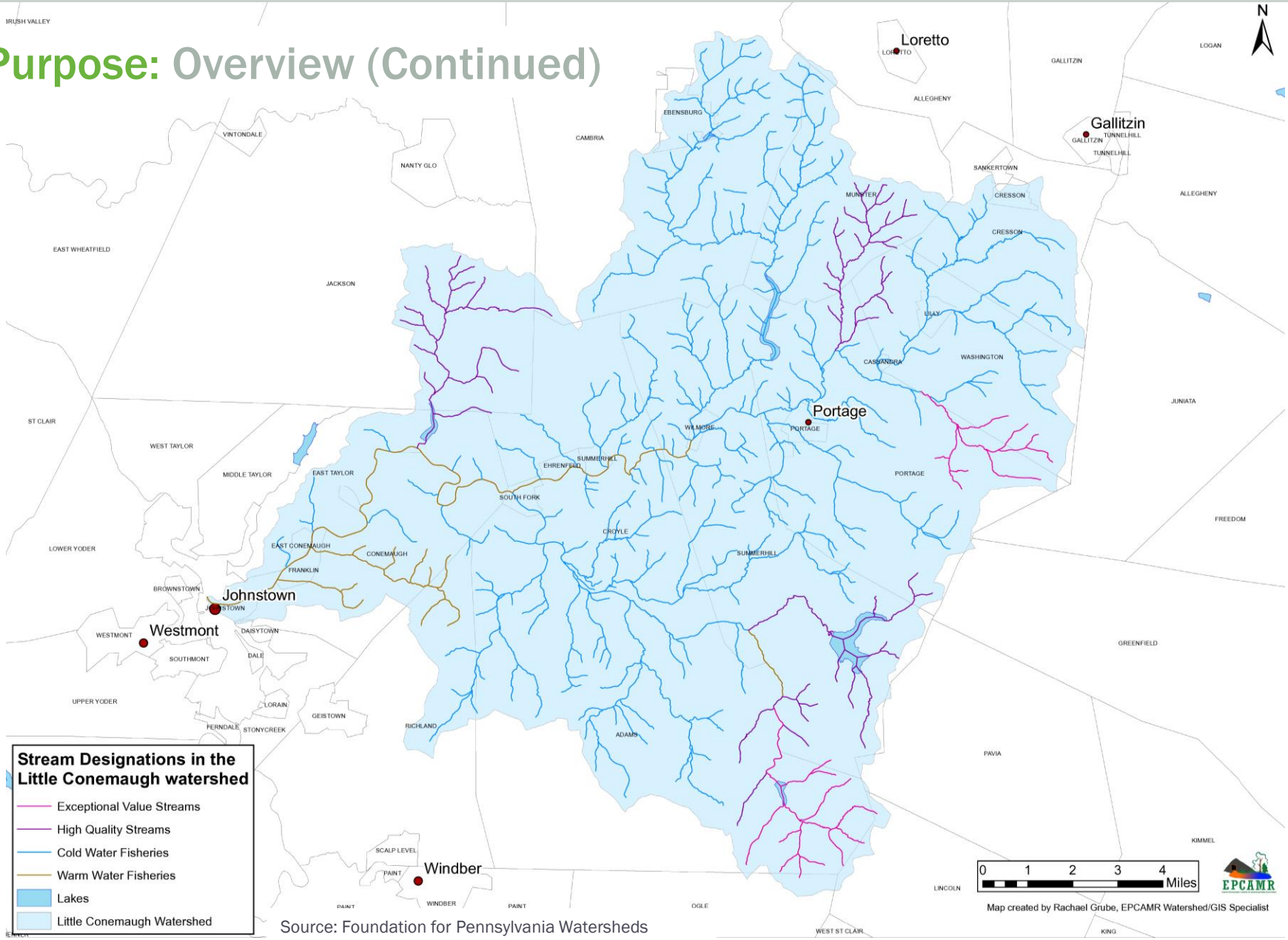
Rank	Site	Loading (#day)	% Total Loading
1	St. Michael	31,141	29.2
2	Sulfur Creek	11,418	10.71
3	Trout Run	14,301	13.41
4	Ehrenfeld	12,742	11.94
5	Sonman	10,370	9.72
6	Hughes Borehole	8,318	7.79
7	Beaverdale	6,755	6.33

Purpose: Overview (Continued)



Source: Foundation for Pennsylvania Watersheds

Purpose: Overview (Continued)



Source: Foundation for Pennsylvania Watersheds

Purpose: Goals

Conemaugh Strategy Group Goal:

Pennsylvania regulations establish the state-wide stream use goals. All streams should be usable:

- by warm water fishes,
- for potable, industrial, livestock, wildlife and irrigation water supply,
- for boating,
- for fishing,
- for swimming and,
- for aesthetics.

Within the Little Conemaugh River watershed are stream reaches which are usable and reaches where some or all uses are impaired by water quality or habitat-related problems. Chief among the sources of pollution are seven extremely large abandoned mine discharges but other smaller sources, of both mine drainage and of other pollutants exist. Pennsylvania DEP has recognized two major goals for the restoration streams with uses impaired by mine drainage:

- '*Tier I*' restoration following which the stream meets all of the state-wide uses, and
- '*Tier II*' where the stream is usable by fish and for boating, swimming and fishing.

Little Conemaugh River Restoration Goals:

Acknowledging the enormity and severity of the pollution problems within the Little Conemaugh, as well as the need for further evaluation of impairments above the seven major mine discharges, the goals for restoration are two-fold:

- *Tier II Restoration*, where possible, of the main stem reaches of both the Little Conemaugh River and the South Fork of the Little Conemaugh River below the location of the seven major abandoned mine discharges to support fish and aquatic life, for boating, swimming and fishing.
- *Tier I Restoration*, where possible, of the main stem reaches of the Little Conemaugh River, the South Fork of the Little Conemaugh River and of the various named and un-named tributaries to meet the state-wide uses described above.

The overall project intent is to treat three discharges, Sonman, Hughes, and Miller Shaft via conveyance through underground mine pools (total project cost of $21.7 million including $19.5 million in BAMR funds and $2.2 million in FPW funds). The water then would be withdrawn via a pump and borehole and treated via an active treatment system.

Projects: Ehrenfeld and St. Michael Projects

Overview

DEP BAMR's 140 acre project is intended to eliminate public health and safety concerns arising from AML features that are located within close proximity to municipality residents. Primary AML concerns include: steep highwalls, refuse piles that are moving and endangering life and property, burning refuse material, and open pits. In addition to health and safety concerns, the project will help mitigate environmental concerns associated with sediment and pollution loadings into the Little Conemaugh River Basin.

This project is expected to employ up to 40 personnel for 18 to 36 months. Removal of the pile creates economic opportunities for Ehrenfeld Borough. The pile encompasses 45 percent of the borough's developable land. This project will invest more than $24 million, which includes $600,000 in matching funds procured with the help of FPW, and more than $3.5 million of AML Pilot funds.

Projects: Ehrenfeld and St. Michael Projects

Since 1963, according to Pennsylvania Mining Reclamation Advisory Board (MRAB) documents, water flowed from the Maryland #1 Mine in St. Michael, Pennsylvania. The water was laden with heavy metals and made the Little Conemaugh from the mouth of Topper Run downstream uninhabitable. This single discharge was responsible for 33 percent of the Little Conemaugh's loadings, and was on the Super 7 treatment list—a list of the seven killer discharges within the Little Conemaugh watershed. Historically the discharge flowed at 2,000 gallons per minute (GPM), had a pH of 5.73, 352 milligrams per liter (mg/L) of acidity, 37 mg/L of alkalinity, 129 mg/L iron, and 1,182 mg/L of sulfates. According to Western Pennsylvania Coalition for Abandoned Mine Reclamation, this resulted in a total loading of 31,141 pounds daily.

In June of 2005, Rosebud mining Company approached the Department offering a proposal for a public private partnership arrangement for perpetual active chemical treatment of the St. Michael mine pool discharge. Rosebud is currently mining, by underground mining methods, the Upper Kittanning coal seam within areas overlying the St. Michael mine pool. This mine is known as Mine 78. The geologic structure in the area is such that a substantial portion of Upper Kittanning coal reserves are situated below the elevation of the St. Michael mine pool. Consequently, in order for Rosebud to access these reserves, the St. Michael pool would need to be lowered by continuous pumping and subsequent treatment of the discharge.

Improvements Completed

Rosebud's construction of a 10,000 GPM lime treatment plant at the location of the St. Michael shaft discharge has had a significant, water quality improvement. Over a proposed 25 to 40 year timeframe, Rosebud will continuously pump and treat the mine pool, lowering the pool elevation by as much as 670 feet. Rosebud and the Department have agreed to a Consent Order and Agreement (CO&A) to specify the construction and long term operation and maintenance of the plant. Under the agreement, Rosebud Mining Company assumes all operational costs of the facility for the life of their mining operation and finance a perpetual trust to fund post closure operation and maintenance of the facility. This project will invest a total of $31 million into the local economy, including $16 million in construction costs and $15 million in a fully-funded trust fund.

Projects: Ehrenfeld and St. Michael Projects

Improving Water Quality

The St. Michael Treatment Plant, is currently treating approximately 3,500 GPM to maintain the mine pool with an average concentration of 1.6 mg/l iron, 0.5 mg/l manganese, and 0.2 mg/l aluminum. This equates to a 99 percent reduction in iron loading, 85 percent reduction in manganese loading and 56 percent reduction in aluminum loading from the St. Michael historical discharge info in the permit. Rosebud's efforts have resulted in a significant visual and chemical improvement within the Little Conemaugh. When the plant was operating at capacity, waters that once flowed orange all the way to Johnstown were clear from St. Michael to Mineral Point (approximately a 10 mile stretch).

The pictures to the right indicate the difference treating St. Michael's Topper Run Discharge makes on the Little Conemaugh. This one discharge accounts for more than 33 percent of the loadings into the waterway. The pictures on the far right is the maximum benefit that would be seen, as the plant was operating at 100 percent – treating 10,000 GPM.

Little Conemaugh at Mineral Point

Projects: FPW and BAMR's Little Conemaugh Project

For more than three years, FPW in partnership with the DEP BAMR has led efforts that will culminate in the treatment of three underground mine pools (Hughes Borehole, Sonman, and Miller Run Discharges). This work underscored that watershed restoration could occur without addressing all of discharges denoted in the Super 7 report completed in 2007. The overall project cost will total approximately $21.7 million.

Pennsylvania regulations establish the state-wide stream use goals. All streams should be usable:

- by warm water fishes,
- for potable, industrial, livestock, wildlife and irrigation water supply,
- for boating,
- for fishing,
- for swimming and,
- for aesthetics.

Within the Little Conemaugh River watershed are stream reaches which are usable and reaches where some or all uses are impaired by water quality or habitat-related problems. Chief among the sources of pollution are seven extremely large abandoned mine discharges but other smaller sources, of both mine drainage and of other pollutants exist.

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- *Tier I Restoration*, where possible, of the main stem reaches of Little Conemaugh River, the South Fork of the Little Conemaugh River and of the various named and un-named tributaries to meet the state-wide uses described above.

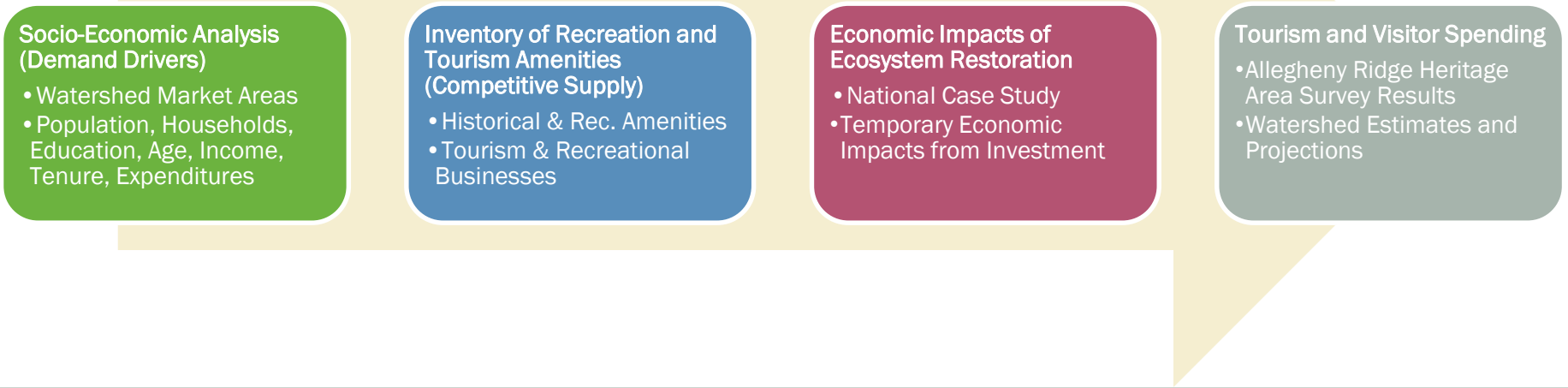
Once these three discharges are treated, it is estimated 15 biologically dead stream miles will be restores and an additional 20 miles will have improved water quality.

Status

Task	Completed	Scheduled
Characterization of the mine water quantity and quality	■	
Identify primary subsurface flow routes	■	
Estimate effects of mixing waters of different composition	■	
Estimate expected improvements in surface water quality completed	■	
Evaluate different treatment scenarios for individual and combined discharges	■	
Right of entry agreements with project property owners	■	
Purchase agreement with primary project property owner	■	
Exploratory drilling and mapping validation	■	
Pump test of the pool	■	
Preliminary geotechnical work	■	
Preliminary footing and structure analysis	■	
Property survey		■
Environmental Site Assessment I		■

Projects: Economic Impact Analysis

4ward Planning was retained by the Keystone Conservation Trust (KCT) to conduct an economic impact analysis for a $21.7 million ecosystem restoration project within the Little Conemaugh River watershed, to be implemented between 2022 and 2023. This report is a summary draft of key findings, analysis, and takeaways performed. The socio-economic analysis identifies key market drivers for outdoor recreation and tourism opportunities within the local area and region, while the second phase identifies the competitive supply of historical, recreation, and tourism amenities and businesses. A combination of case study analysis and benefit transfer techniques were utilized in order to identify temporary (during project implementation) and ongoing economic impacts from restoration efforts (due to increased visitor spending). Additionally, 4ward Planning conducted interviews with various organizations: active conservation groups; tourism and recreation groups; outdoor sportsman organizations, and tourism-related businesses working in the watershed.



Takeaways: Economic Impact Analysis

Baby Boomers and regional households with higher spending power may present new recreation and tourism opportunities.

To identify potential market demand in the region, 4ward Planning analyzed socio-economic trends within the Little Conemaugh watershed, Cambria County, and within two drive-time contours from the center of the watershed: the 60-minute primary market area (PMA) and the 90-minute secondary market areas (SMA). Despite relatively flat population and household growth expected through 2023, the aging of the region's population, overall, will present new recreation and tourism opportunities, as Baby Boomers retire and have more time for leisure activities. Furthermore, consistent with relatively high levels of educational attainment and household incomes observed in the 90-minute SMA, 2018 average household expenditures in the SMA (on a range of goods and services) are consistently higher than those within the watershed area.

Regional households participate in a variety of outdoor activities like fishing, camping, and biking,

Currently, within the Little Conemaugh watershed, there is one campground (Adams Croyle), five fishing and boating access points, 15 square miles of dedicated open space (includes wild and natural areas, state parks, local parks, state forests, and state gamelands), 21 trailheads, and 27 miles of trails and greenway trails. According to data provided by Esri's Tapestry Segment profiles, both local and regional households have participated in variety of outdoor activities like walking, fishing, jogging, hiking and, biking, etc. in the past 12 months. However, due to the quality of the water in the watershed, fishing is limited to the north Branch, the headwaters of the South Fork, and a handful of feeder streams. A cleaner river would offer additional outdoor recreational opportunities, providing a boost to the area's growing tourism industry.

Takeaways: Economic Impact Analysis (Continued)

Clean-up of the Little Conemaugh will lead to an increase in recreation- and tourism-related economic activity, the magnitude and timing of which remains speculative.

Our interviews with 18 individuals representing tourism- and recreation-related organizations and businesses active in the Little Conemaugh and Stonycreek watersheds resulted in a diverse range of feedback regarding the potential economic and recreation impacts of a cleaned-up Little Conemaugh River. Collectively, the interviewees agreed that the AMD clean-up of the river would ultimately result in positive recreation- and tourism-related economic impact to the area. However, there was wide disagreement on the magnitude of this impact and the time in which it would take to realize.

Clean-up of the Little Conemaugh may provide an opportunity for an additional recreational outfitter but likely not new restaurants and lodging facilities.

According to data provided by Esri, there are 27 food and beverage stores and 10 tourism and recreation businesses within the watershed. According to interview feedback, clean-up of the Little Conemaugh may provide an opportunity for an additional recreational outfitter in the area providing both boating equipment (e.g., kayaks, canoes, rafts, tubes, etc.) and bike rentals. While a clean Little Conemaugh will provide an opportunity for additional fishing (bass and trout), it will likely only result in a limited increase in new fishing activity (e.g., net new recreational fisherman). The increase in recreational activity may be enough to support additional restaurant employment, but not, necessarily, additional restaurants. The seasonality of outdoor recreation and the relatively limited increase in the number of persons participating limit the demand necessary to support the development of new restaurants and lodging facilities.

Takeaways: Economic Impact Analysis (Continued)

For every million dollars spent locally during restoration, national ecosystem restoration projects generate $1.7 million in economic output.

To better understand how ecosystem restoration efforts in the Little Conemaugh watershed can impact the local economy, 4ward Planning utilized case study data, to identify six national ecosystem restoration case study projects representing a range of restoration types including acid mining drainage abatement. On average, 65 percent of total project expenditures among the six case study ecosystem restoration projects was spent locally, although this share ranged widely by project. Case study findings found that over the duration of an ecosystem restoration project, for every million dollars spent locally, these projects supported approximately 13 annualized full- and part-time jobs (accumulated over the duration of a restoration project), and generated $776,260 in labor income, $897,150 in value added, and $1.7 million in economic output.

The Little Conemaugh's AMD project is projected to generate between $1.5 and $1.6 million in economic output for every $1 million in restoration investments.

According to the Bureau of Mine Reclamation, the Little Conemaugh's AMD treatment facility is estimated to cost $21.7 million, with construction projected to last from 2022 to 2023. During restoration, the project is estimated to support approximately 40 direct jobs with contractors expected to come from within a 60-mile radius area. Project investment is expected to support between 66 and 70 total jobs per year (direct, indirect, and induced), and generate between $5.7 and $6.1 million in labor income, between $8.4 and $9.1 million in value added, and between $16.5 and $17.8 million in economic output. For every million dollars spent locally, the project is expected to support between 12 and 13 jobs (over the duration of the restoration project), and generate between $526,650 and $563,200 in labor income, between $771,750 and $838,770 in value added, and between $1.5 and $1.6 million in economic output.

Takeaways: Economic Impact Analysis (Continued)

In 2014, non-local visitor spending in the Allegheny Ridge Heritage Area contributed $55.3 million in total economic output

The Little Conemaugh watershed is located within the Allegheny Ridge Heritage Area (HA), with two of the HA's top attractions located within the watershed (Staple Bend Tunnel and the Johnstown Flood Memorial). Since visitor spending by local residents as a result of new investment would likely remain within the region or shift to another category, an "economic impact analysis" should focus on non-local visitor spending from those residing outside the local region, as their spending constitutes "new dollars" to the region. According to 2014 visitor surveys conducted by the Center for Rural Pennsylvania, non-local visitor spending resulted in $55.3 million in total economic output, and supported 741 total jobs and $22.1 million in total labor income when including indirect and induced effects. For every four jobs directly supported by non-local visitor spending, another indirect job is supported (multiplier of 1.24).

In 2018, non-local visitor spending in the watershed is estimated to contribute $4.6 million in total economic output (expected to increase to $7.0 million by 2040).

In 2018, the $6.2 million in estimated spending from 92,660 out-of-town visitors is estimated to result in $4.5 million in total economic output, and support 84 total jobs and $1.9 million in total labor income, inclusive of indirect and induced effects. Similar to the Allegheny Ridge HA, for every four jobs directly supported by out-of-town visitor spending, another indirect job is supported annually (multiplier of 1.21). Assuming one-percent annual growth in visitors in the watershed starting in 2026 (after restoration efforts are completed), by 2040 the watershed is expected to attract 106,510 out-of-town visitors (an additional 13,850 out-of-town visitors). By 2040, the $11.5 million in spending from all out-of-town visitors could result in $7.0 million in total economic output, support 96 total jobs, and generate $979,850 in annual local, state, and federal taxes.

Visitor Spending

- 92,660 out-of-town visitors
- $6.2 million in spending
- 84 permanent jobs
- $1.9 million in labor income
- $3.1 million in value added
- $4.6 million in economic output
- $854,640 in est. annual taxes

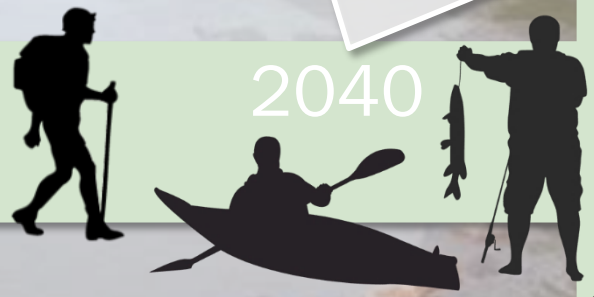
2018

2022-2023

Restoration Investment

- $21.7 million in investment
- 66 - 70 temporary jobs
- $5.7 - $6.1 million in labor income
- $8.3 - $9.1 million in value added
- $16.5 - $17.8 million in economic output

2040



Visitor Spending

- 106,510 out-of-town visitors
- $11.5 million in spending
- 96 permanent jobs
- $2.1 million in labor income
- $3.6 million in value added
- $7.0 million in economic output
- $979,850 in est. annual taxes

INTERVIEWS WITH OUTDOOR RECREATION AND CONSERVATION ORGANIZATIONS

4WARD PLANNING™

Interviews: Background

In August 2018, 4ward Planning began contacting local and regional outdoor recreation and conservation organizations - including municipal and non-profit groups, as well as several private businesses (e.g., outdoor recreation operators, outfitter, hotelier) - to gather their perspectives on the economic and recreation potential of a cleaned-up Little Conemaugh watershed. Out of 28 individuals contacted through a series of phone calls and emails, 18 were successfully interviewed or, at very least, responded to email inquiries. Interviews typically lasted from 15 to 30 minutes.

The interviews included discussions of the current recreation and tourism assets in the area; the role public perceptions might play in the timing of renewed recreational use of the Little Conemaugh; the potential economic impacts of a restored Little Conemaugh; and the distinction between *economic impacts* and *economic shifts,* in light of renewed recreational use of the Little Conemaugh. Specifically, we asked interviewees if they thought a cleaned-up Little Conemaugh would more likely attract new tourism and spending in the area (economic impact), or shift tourism and spending from an adjacent recreational areas to the Little Conemaugh (economic shift).

Following is a summary of feedback from these interviews. A list of interviewees and their coordinates can be found in the Appendix.

Interviews: Feedback

The feedback from our interviews, while diverse in perspective, offered points of concurrence regarding the recreation- and tourism-related economic opportunities likely to emerge after cleanup of the Little Conemaugh, as well as a few notable differences of opinion regarding the magnitude of these opportunities and how long they might take to realize. The following is a compendium of the most salient points offered in our discussions – in which there is both agreement and disagreement of perceptions and projected outcomes.

Points of Concurrence

The Stonycreek River cleanup paved the way and changed perceptions.

All interviewees agreed that local perceptions of Cambria County's waterways, generally, have improved in recent years, following the cleanup of portions of the Stonycreek River and subsequent renewed activity upon it. The Stonycreek's 2012 Pennsylvania Department of Conservation and Natural Resources (DCNR) designation as the Pennsylvania River of the Year and recognition of its class-three rapids seem to have propelled a surge in outdoor recreation in the area – seen, to a much lesser extent, on portions of the Little Conemaugh. Cleanup of the Stonycreek River resulted in recreation and tourism economic impacts – with a boom in ecotourism, whitewater rafting, boating, kayaking, and year-round fly-fishing. Whitewater and Greenhouse Parks sprang up in Cambria and Somerset Counties because of the Stonycreek cleanup. The spring Stonycreek Rendezvous event, drawing participants from, by some estimates, as many as 12 states and several countries, along with the offerings of local outdoor recreation operators (e.g., Coal Tubin and Two Dam Kayak Rentals) have contributed to increased recreation and tourism traffic in Cambria County. According to the Johnstown Holiday Inn, there has been a sizeable uptick (estimated 20 to 30 percent) in recreational overnight visitors to its hotel over the past three years – primarily coming from within the region and State. Several interviewees mentioned seeing "more kayaks and mountain bikes on cars" in recent years.

Interviews: Feedback (continued)

The Stonycreek River can be used as both a model and a cautionary tale for the Little Conemaugh.

Along with the Stonycreek River cleanup successes, which could be used as a model for the Little Conemaugh, the example also provides lessons which may inform the Little Conemaugh cleanup, as it moves forward. Currently, the Stonycreek watershed is facing threat of degradation, as its treatment systems are 20 to 25 years old and in need of updates and replacements. As no trust fund was established for repairs, its funding is currently unsettled.

A cleaned-up Little Conemaugh will increase recreation and tourism in the region.

Interviewees offered that a cleaned-up Little Conemaugh would not dilute the numbers of recreational users in adjacent areas, as there will be "enough tourism to go around." Some suggested the Little Conemaugh will likely attract different users from those on the Stonycreek, as the Little Conemaugh is, generally, a slower float and offers access to its own adjacent trails. If anything, most interviewees agreed that a cleaned-up Little Conemaugh, as a piece of the larger conservation area would, in time, increase recreation and tourism traffic to the region. As such, the Little Conemaugh's cleanup would ultimately result in economic impact, rather than economic shift. The magnitude of the impact, however, can only be speculative, at this point.

A cleaned-up Little Conemaugh will create a new waterway-trail synergy.

The development of converging trails (e.g., rail trails; September 11th National Memorial Trail) that connect communities and greater regions (e.g., Pittsburgh, New York) alongside cleaned-up waterways have been and can be transformative for the recreation and tourism industry in Cambria County. Once cleaned up, the Little Conemaugh will provide another attractive, usable waterway beside its adjacent trial (i.e., the rail trail) - creating a new trail-waterway synergy, where hikers and bikers will have ready access to boating and fishing, and vice versa.

Interviews: Feedback (continued)

Coordinated, easy-to-use wayfinding signage will improve the Little Conemaugh's visitor traffic.

Interviewees emphasized Cambria County's need for improved wayfinding signage in and around its outdoor recreation areas. The addition of such, which might include water and trail maps and guides, would maximize recreation and tourism traffic to the Little Conemaugh. The *coordination* of the region's recreation signage is equally important, increasing the likelihood of creating new recreation and tourism traffic to less accessible destinations like the Little Conemaugh.

Accessibility is a challenge to recreation and tourism on the Little Conemaugh.

Many interviewees noted that the Little Conemaugh is currently lacking in easy public access points. As the Little Conemaugh watershed is not particularly easy to access from a road transportation standpoint, public access points to the waterway itself should be more user-friendly.

A robust marketing and public education campaign is essential to drawing visitors to the Little Conemaugh.

Interviewees concurred that well-orchestrated public education and marketing campaigns are essential in bringing recreation and visitors back to the Little Conemaugh, as dismantling negative public perceptions can determine how long a rebound of activity will take. Such outreach is being considered by the Convention & Visitors Bureau within its Vision 2025 initiative, which includes focus on a greater marketing and promotion of the area's recreation and tourism spots. Some interviewees noted that Cambria County's recreation and tourism industry would also benefit from a more cohesive online and physical (e.g. wayfinding and kiosks) presence, as it was described as "fragmented" in its marketing to both the local and broader audience.

Interviews: Feedback (continued)

Points of Difference

The timeframe of a full rebound of activity on the Little Conemaugh is speculative, at this point.

When asked how long it might take for a recognizable, full rebound of recreation activity on the Little Conemaugh, interviewees varied greatly in their estimates – by anywhere from two to 20 years post-cleanup. Several interviewees suggested the Little Conemaugh's rebound may be faster than that of the Stonycreek, as the local population already has the successful cleanup of the Stonycreek for reference.

Recreation and tourism economic impacts of the Little Conemaugh's cleanup are speculative, at this point.

Interviewees varied greatly in their visions of the economic impacts of a cleaned-up Little Conemaugh. Although all believe the cleanup *will* provide economic benefit to the area, the magnitude of benefit is clearly speculative, at this point. A few interviewees predicted exponential economic benefit, whereas others were much more conservative in their impact estimates. Some of the benefit might be dependent on the white water classifications of sections of the Little Conemaugh, as white water recreational activity (which is reportedly greater on the Stonycreek) has far more economic impact potential than flat water recreational activity.

Demand for new recreation- and tourism-related businesses is speculative, at this point.

Interviewees offered mixed responses regarding demand for new recreation- and tourism-related businesses in the area as a result of the Little Conemaugh cleanup. Some offered that there might be enough new demand for a bike and boat rental business, but probably not enough for a single-purpose outfitter. As for lodging, it appears there are enough rooms in the area to satisfy any increased demand that a cleaned-up Little Conemaugh might attract. Ultimately, if more lodging is needed, it will likely be because of a regional increase in tourism. In any event, a cleaned-up Little Conemaugh will encourage its users to spend money on existing recreation- and tourism-related businesses – the degree to which is currently speculative.

SOCIO-ECONOMIC TRENDS

4WARD PLANNING™

Key Findings: Socio-Economic Analysis

The aging of the region's population will present new opportunities

Through 2023, all study geographies are expected to experience the fastest population growth in age cohorts representing older empty nesters (ages 65 to 75) and mostly retired persons (over 75 years) – partially representing the Baby Boom Generation (currently between ages 54 and 74). The shifting and aging of the region's population, overall, will present new recreation and tourism opportunities, as Baby Boomers retire and have more time for leisure activities.

Higher average household expenditures in the 90-minute SMA

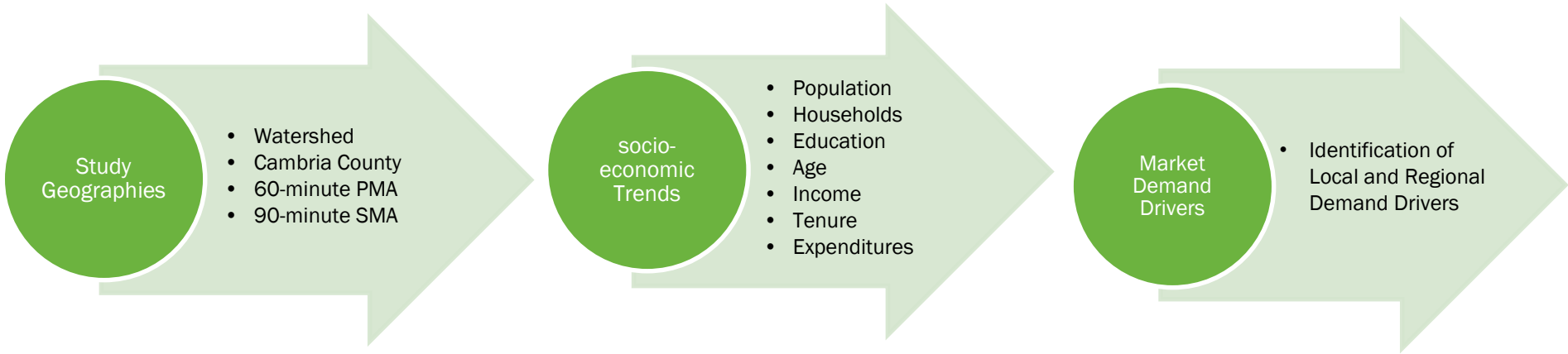
Consistent with relatively high levels of educational attainment and household incomes, 2018 average household expenditures (on a range of goods and services) within the 90-minute SMA are consistently higher than those within the watershed area.

Local and regional households participate in many outdoor activities

According to Esri's Tapestry Segment profiles, many local and regional households participate in variety of outdoor sports and leisure activities. Based on selected outdoor sports and leisure participation estimates provided by Esri, walking for exercise and fresh water fishing are two of the most common outdoor sports and leisure activities in which local area and regional households have participated in the past 12 months.

Methodology: Socio-Economic Analysis

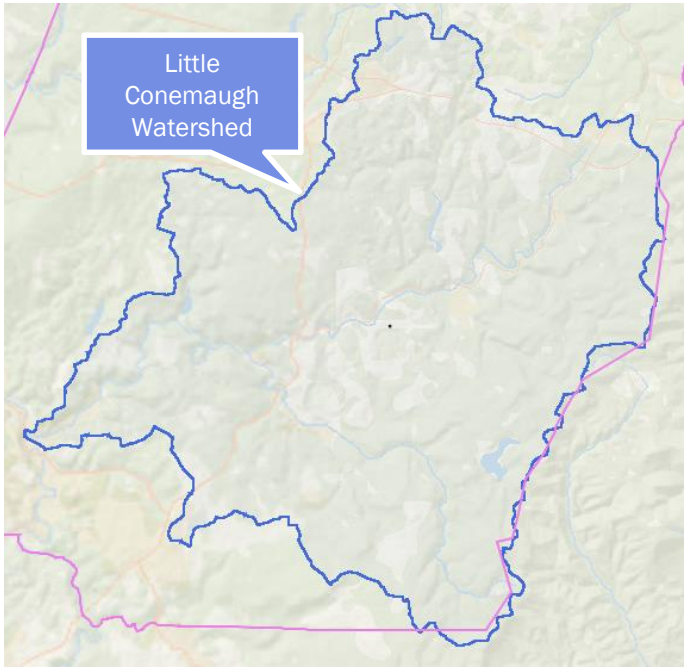
In order to identify population and household metrics in the region, 4ward Planning analyzed socio-economic trends within the Little Conemaugh watershed, Cambria County, and within two drive-time contours from the center of the watershed: the 60-minute primary market area (PMA) and the 90-minute secondary market areas (SMA). Using a combination of published government data (U.S. Census Bureau, American Community Survey 5-Year Estimates) and proprietary analysis software (Esri Community Analyst), 4ward Planning prepared a series of data tables comparatively illustrating socio-economic trends for three market areas. Socio-economic trends associated with population, households, educational attainment, and age cohorts were analyzed. Additionally, we analyzed income distribution, residential tenure rates (owner-occupied versus renter-occupied), and consumer expenditure estimates. Demographic data for each of the site areas is displayed for 2010, 2018 (estimated), and 2023 (projected). Study areas are presented in more detail on the following page.

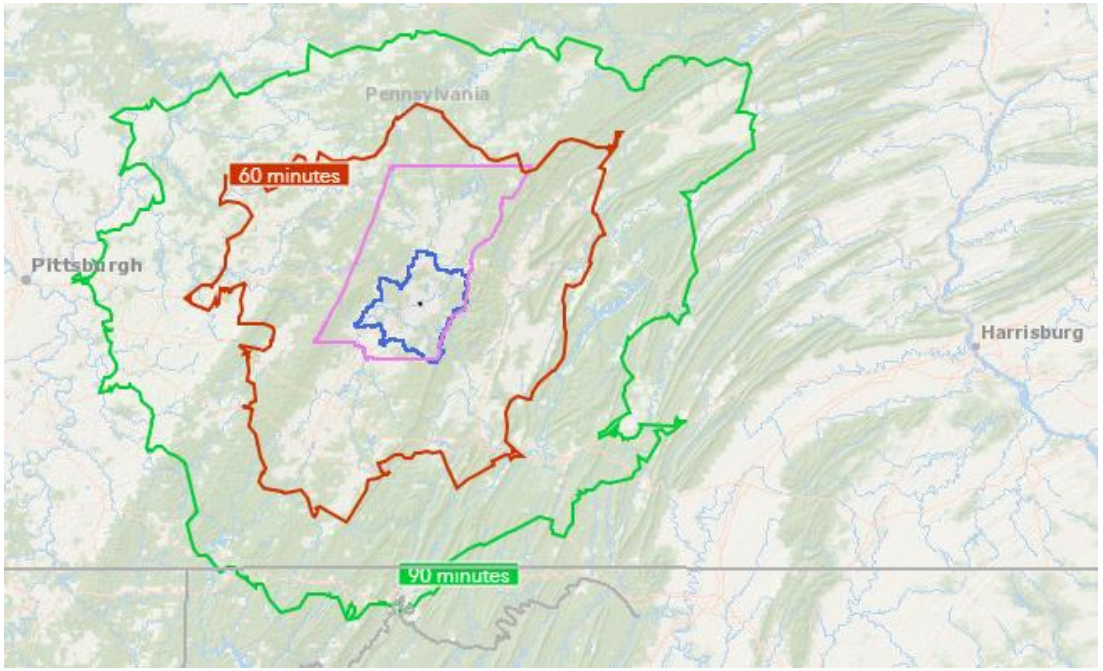


Methodology: Study Areas

As presented in the map to the right and below, the report uses the following study areas:

- **Watershed**: The Little Conemaugh river is located in the 190-square-mile Little Conemaugh watershed.
- **Cambria County**: The watershed is largely located in the southern portion of Cambria County, PA.
- **Primary Market Area**: The primary market area (PMA) encompass a 60-minute drive time from the center of the watershed and represents 70 percent of the likely annual patron base (people living in closest proximity to a watershed area exhibit the greatest propensity to use it).
- **Secondary Market Area**: The secondary market area (SMA) encompass a 90-minute drive time from the center of the watershed and represents persons who may visit the watershed once or twice annually.





Source: Esri; 4ward Planning Inc., 2018

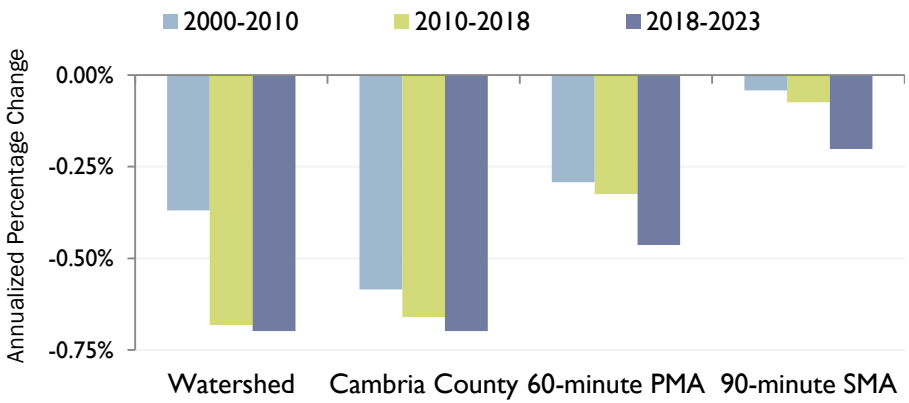
Near-Term Population Growth

As illustrated to the right, all geographies experienced relatively flat population growth between 2010 and 2018 (decreasing by less than 0.75 percent per year). This trend is expected to continue through 2023, absent major in-migration and/or new real estate development. Over the next five years (and absent large-scale development), total population within the 90-minute SMA is projected to decrease by approximately 11,830 residents (representing a decrease in potential recreational users).

Annualized Growth Rate Assumptions

Strong Positive Growth	Greater than	1.50%			annually
Modest Positive Growth	Between	1.50%	and	0.75%	annually
Flat Growth	Between	0.75%	and	-0.75%	annually
Modest Negative Growth	Between	-0.75%	and	-1.50%	annually
Strong Negative Growth	Less than	-1.50%			annually

Annualized Percentage Change, Total Population



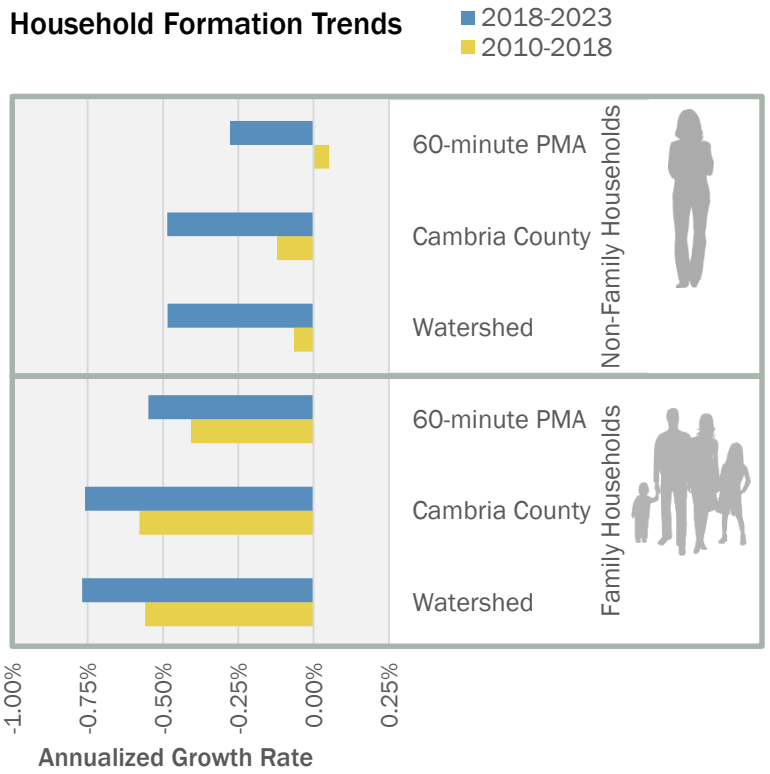
Population by Geography

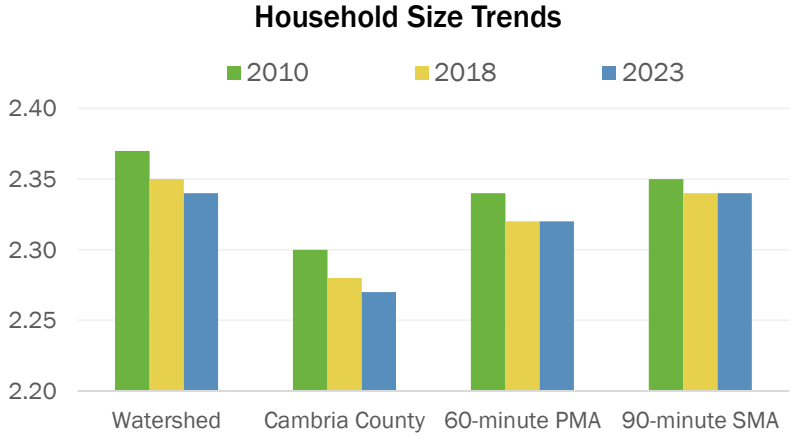
	2000	2010	2018	2023	Net Change (2018-2023)
Watershed	41,060	39,544	37,387	36,082	-1,305
Cambria County	152,598	143,679	136,092	131,341	-4,751
60-minute PMA	470,427	456,643	444,787	434,470	-10,317
90-minute SMA	1,183,543	1,178,522	1,171,542	1,159,713	-11,829

Source: US Census Bureau; Esri; 4ward Planning Inc., 2018

Household Formation

As illustrated in the chart to the right, although both non-family and family household growth in all geographies is expected to remain negative, albeit relatively flat through 2023, the decline in non-family household formation (top right) in all geographies is expected to be slightly less, compared to the rates of family household growth (bottom right). As illustrated below, average household size has also been decreasing slightly in recent years, but is expected to remain relatively flat over the next five years.





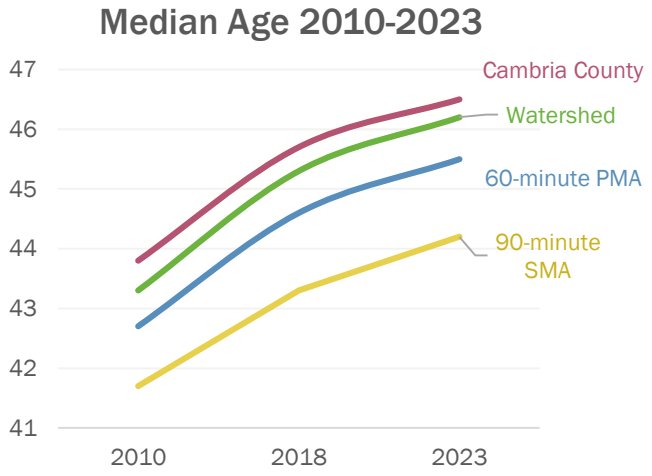
Households by Geography

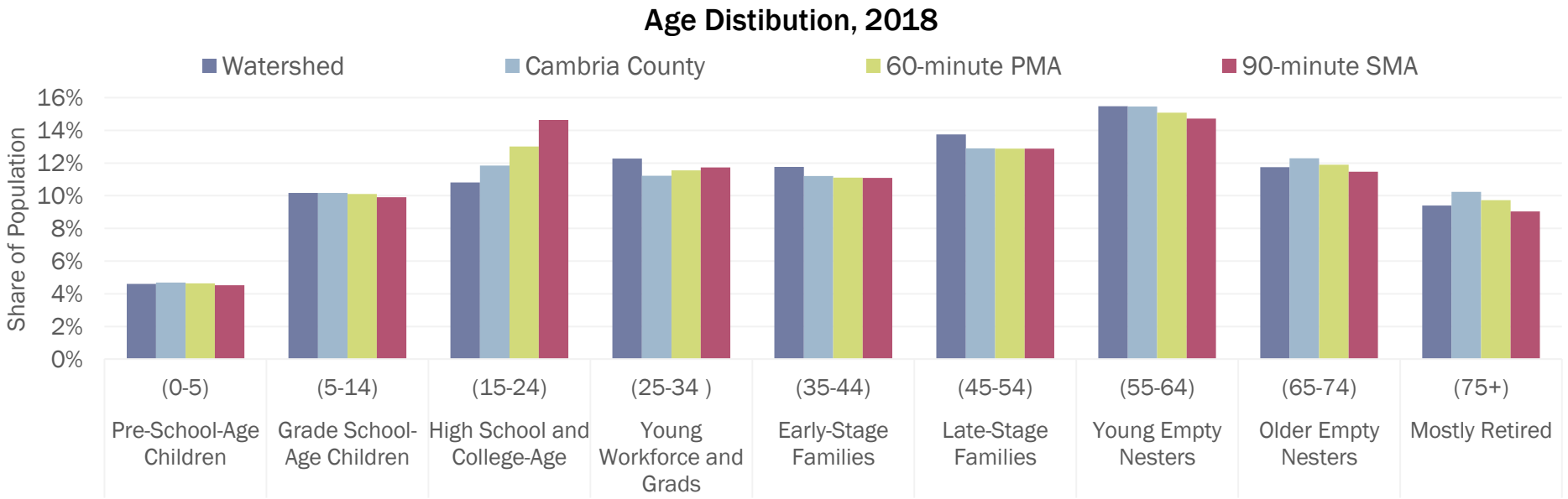
	2000	2010	2018	2023	Net Change (2018-2023)
Watershed	15,584	15,548	15,059	14,554	-505
Cambria County	60,531	58,950	56,995	55,118	-1,877
60-minute PMA	185,635	185,975	182,341	178,239	-4,102
90-minute SMA	464,386	476,711	474,888	470,290	-4,598

Sources: US Census Bureau; Esri; 4ward Planning Inc., 2018

Age Distribution

As illustrated in the chart to the right, the median age in the watershed (45 years) is slightly higher than that within the 90-minute SMA (43 years). Although the median age in all geographies is expected to increase through 2023, the median age in 90-minute SMA will remain lower than that within the closer watershed area. Most notably, as illustrated below, the watershed area has lower shares of high-school-age children (ages 15 to 24).



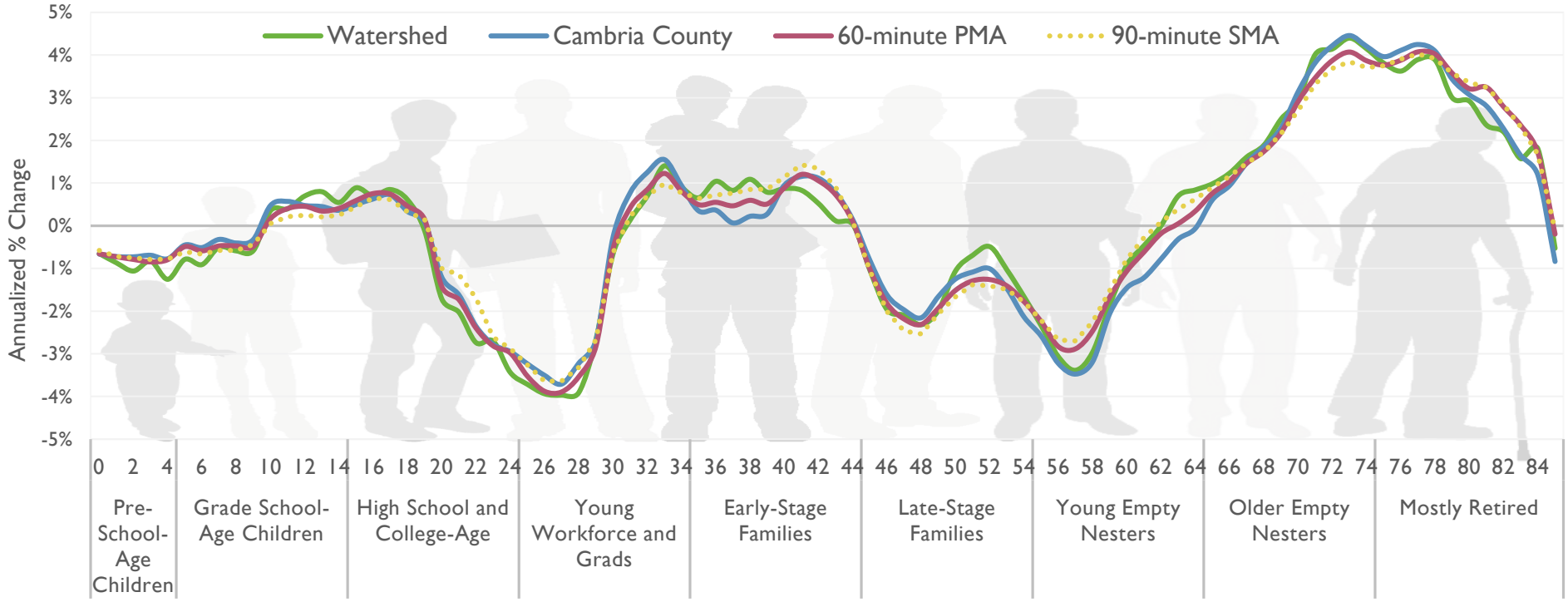


Source: Esri; 4ward Planning Inc., 2018

Age Cohort Growth Patterns

Through 2023, all study geographies are expected to experience the fastest population growth in age cohorts representing older empty nesters (ages 65 to 75) and mostly retired persons (over 75 years) – partially representing the Baby Boom Generation (currently between 54 and 74 years old). The shifting and aging of the region's population, overall, will present new recreation and tourism opportunities, as Baby Boomers retire and have more time for leisure activities.

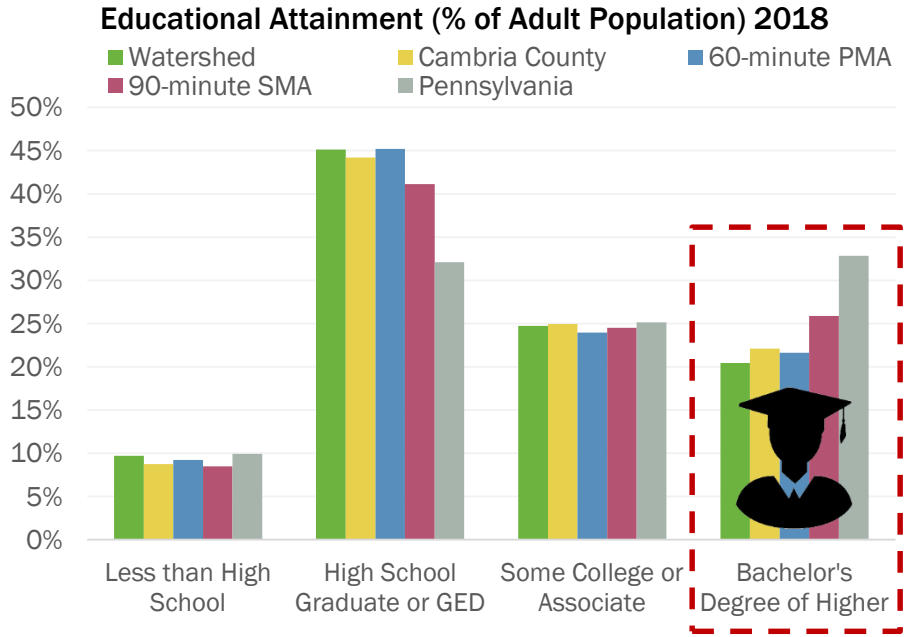
Age Cohort Growth, 2018-2023

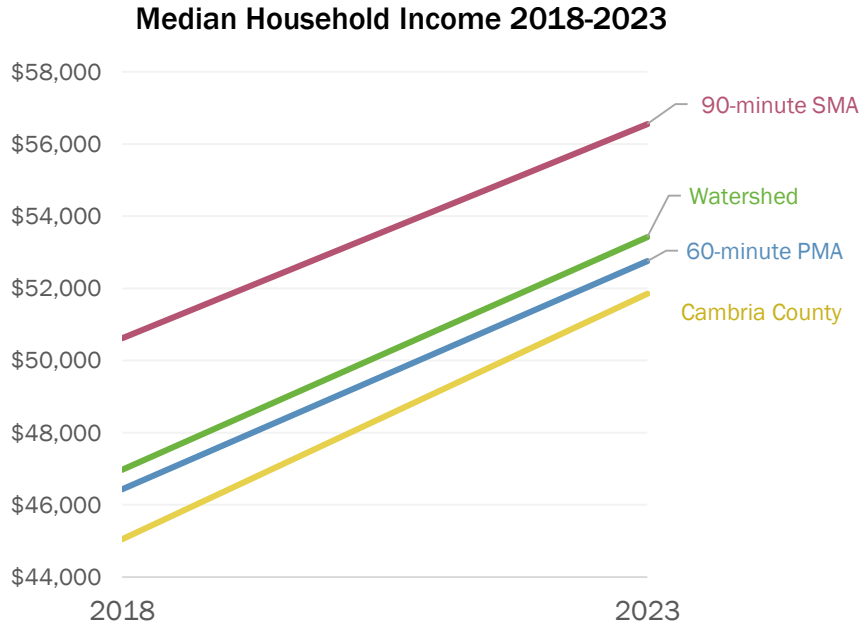


Source: US Census Bureau; Esri; 4ward Planning Inc., 2018

Educational Attainment & Income

The chart below comparatively illustrates estimated 2018 educational attainment across all three geographies. Educational attainment is highest in the 90-minute SMA, where 26 percent of adult residents 25 and older hold a bachelor's degree or higher level of education, compared to 20 percent within the watershed area and 33 percent within Pennsylvania, overall. Since median household income is often correlated with educational attainment, it is not surprising that 2018 median household income in the 90-minute SMA ($50,620) is also much higher than that within the watershed area ($46,980). Although the median household income in all geographies is expected to rise over the next five years, it is expected to remain higher in the SMA.

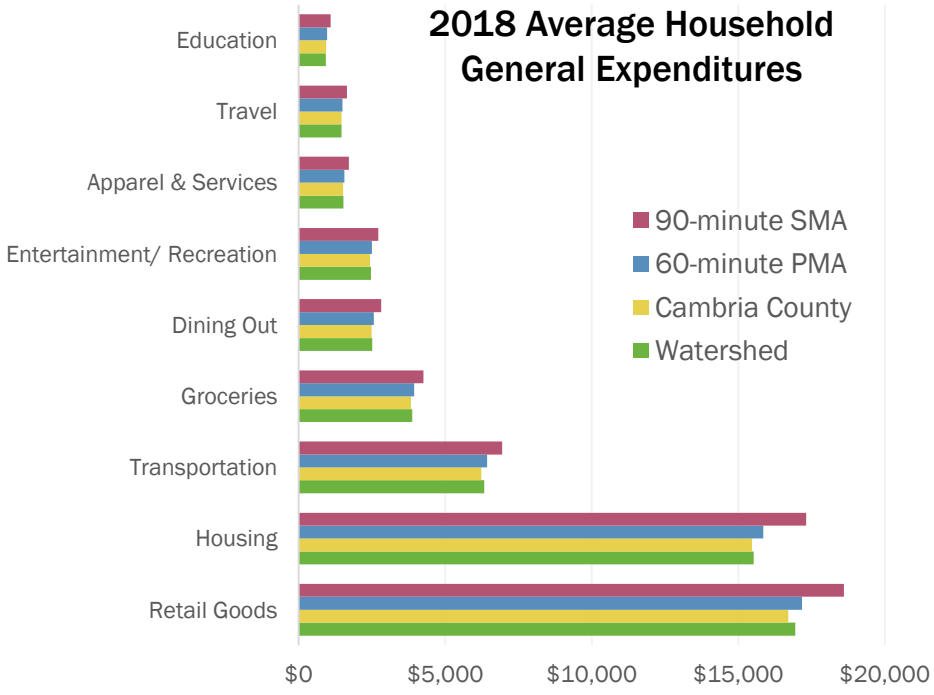


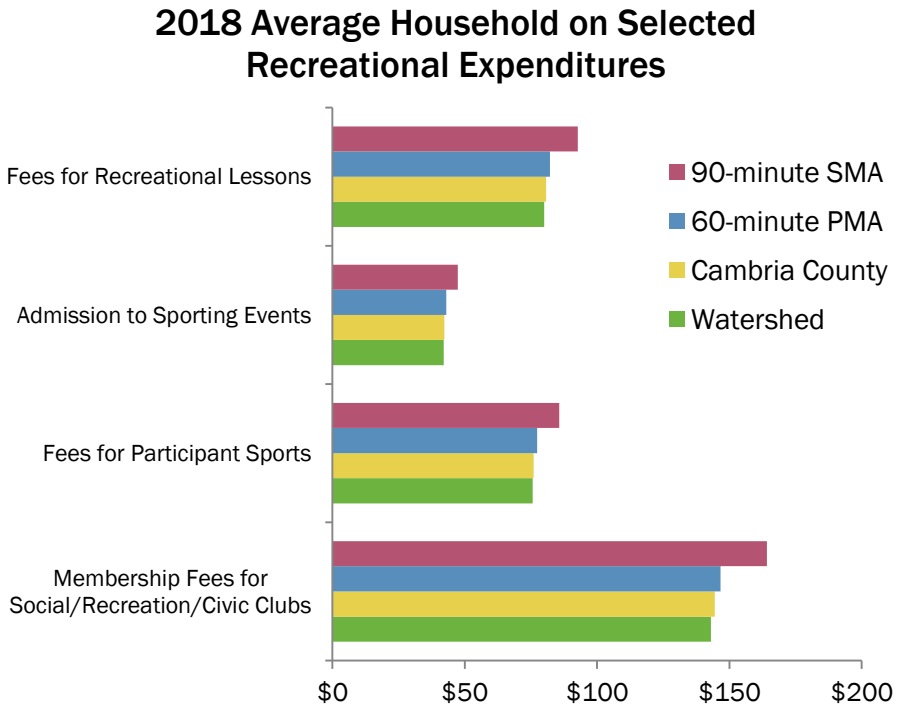


Source: Esri; 4ward Planning Inc., 2018

Household Consumer Expenditures

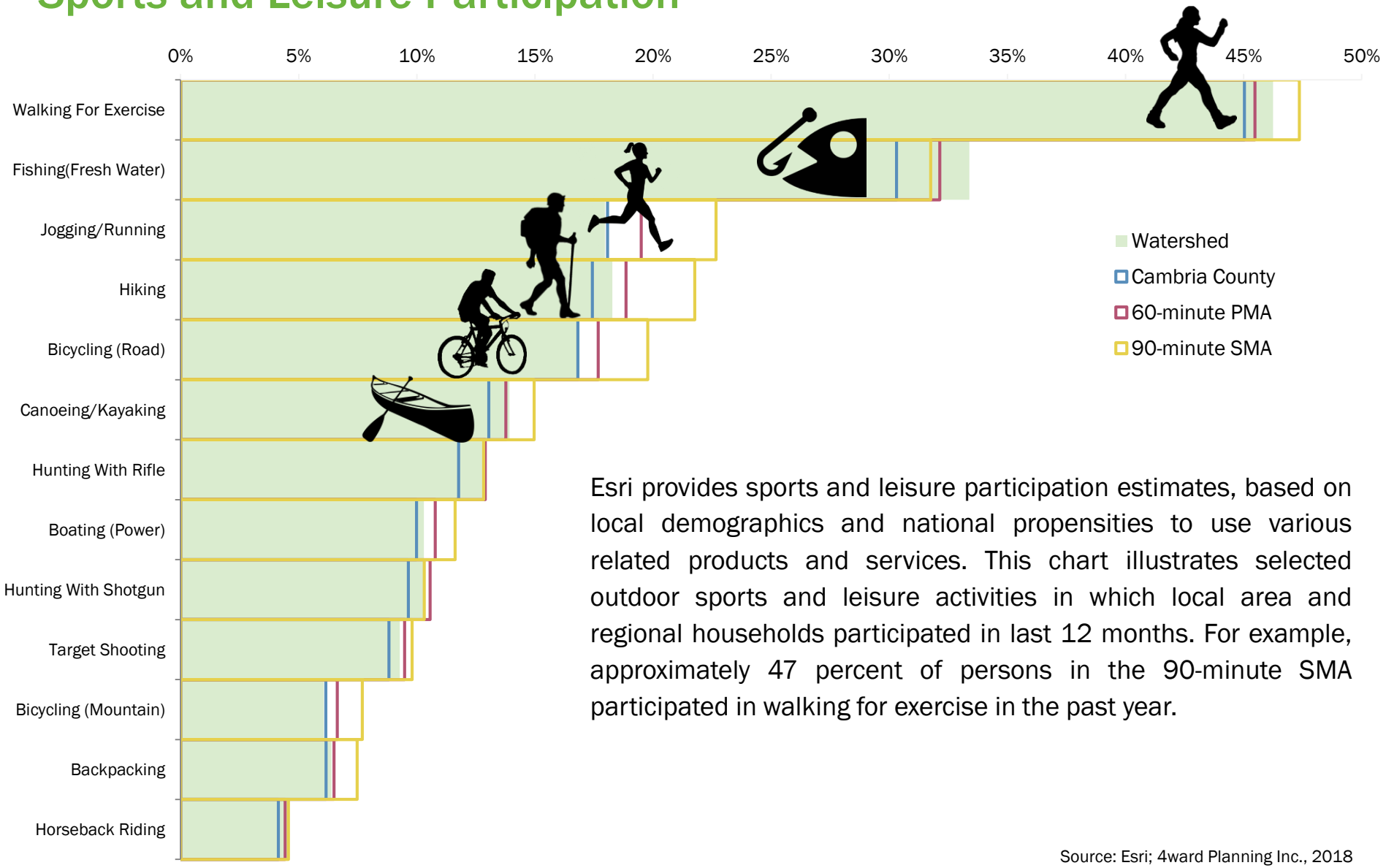
Consistent with relatively high levels of educational attainment and household incomes, 2018 average household expenditures (on a range of goods and services) within the within the 90-minute SMA are consistently higher than those within the watershed area. As illustrated in the graphics below, the average household in the 90-minute SMA (indicated in red) spends more than the average household within watershed area (indicated in green).





Source: Esri; 4ward Planning Inc., 2018

Sports and Leisure Participation



Esri provides sports and leisure participation estimates, based on local demographics and national propensities to use various related products and services. This chart illustrates selected outdoor sports and leisure activities in which local area and regional households participated in last 12 months. For example, approximately 47 percent of persons in the 90-minute SMA participated in walking for exercise in the past year.

Source: Esri; 4ward Planning Inc., 2018

Tapestry Segments: An Overview

Businesses in many industries (inclusive of tourism and recreation) utilize market segmentation to better understand their customers' lifestyle choices, purchasing preferences, and how they spend their free time. It is also how retailers and other site selectors compare consumer trends across trade areas when considering different site locations.

Esri's Tapestry Segmentation process classifies U.S. residential neighborhoods into 65 unique segments based on demographic variables such as age, income, home value, occupation, household type, education, and other consumer behavior, demographic, and socio-economic characteristics.

According to Esri, companies, agencies, and organizations have used segmentation to divide and group consumer markets to more precisely target their best customers and prospects. This targeting method is, purportedly, superior to using "scattershot" methods that might attract preferred groups. Segmentation explains customer diversity, simplifies marketing campaigns, describes lifestyles and life-stages, and incorporates a wide range of data.

Segmentation systems operate on the theory that people with similar tastes, lifestyles, and behaviors seek others with the same tastes - "like seeks like." These behaviors can be measured, predicted, and targeted. Esri's Tapestry Segmentation system combines the "who" of lifestyle demography with the "where" of local neighborhood geography to create a model of various lifestyle classifications or segments of actual neighborhoods with addresses - distinct behavioral market segments.

Source: Esri; 4ward Planning Inc., 2018

Top Tapestry Segments: 90-Minute SMA

The figure below briefly describes household and recreational profiles of the top 10 Tapestry Segment profiles by share of total households within the 90-minute SMA, according to data provided by Esri. Most of these top tapestry segments participate in a variety of outdoor activities like fishing, camping, hiking, and hunting. Many of these households likely support investment being made to clean up the Little Conemaugh watershed as it will increase local outdoor recreation opportunities.

Salt of the Earth (14.5%)
- Older residents in traditional, rural lifestyles who enjoy outdoor sports and camping

Midlife Constants (12.8%)
- Retiring seniors with above-average net worth who enjoy leisure activities like fishing and golf.

Heartland Communities (12.6%)
- Older householders who actively participate in outdoor activities and domestic driving vacation.

Rooted Rural (10.5%)
- Married couples who enjoy spending time outdoors, hunting, or fishing.

Comfortable Empty Nesters (6.3%)
- Married couples who are physically active, they play golf, ski, and ride bicycles.

Small Town Simplicity (6.0%)
- Young families and senior householders who enjoy rural activities like hunting and fishing.

Traditional Living (3.7%)
- Mix of married-couple families and singles who enjoy outdoor activities like camping.

In Style (3.3%)
- Professional couples or single households without children who like to travel.

Green Acres (2.9%)
- Couples who participate in outdoor activities like hunting, fishing, hiking and camping.

Old and Newcomers (2.7%)
- Predominantly single households who are strong supporters of environmental causes

Source: Esri; 4ward Planning Inc., 2018

Top Tapestry Segments

The figure below compares key income, worth, and entertainment and recreation spending characteristics across the top 10 Tapestry Segment profiles by share of total households. Given their strong presence within the watershed, County, and primary and secondary market areas, recreation and tourism business within the watershed should targeted the recreational interests and consumer needs of these top socio-economic groups.

		Share of Households				Spending Metrics		
Tapestry Segment	Household Type	Watersehd	Cambria County	60-minute PMA	90-minute SMA	Median HH Income	Median Net Worth	Entertainment & Rec Spending Index *
Salt of the Earth	Married Couples	19.9%	14.6%	15.9%	14.5%	$56,300	$167,700	96
Midlife Constants	Married Couples w/No Kids	23.7%	21.2%	16.3%	12.8%	$53,200	$138,300	90
Heartland Communities	Married Couples	20.4%	22.1%	17.3%	12.6%	$42,400	$70,900	73
Rooted Rural	Married Couples	6.8%	6.3%	9.6%	10.5%	$42,300	$92,500	76
Comfortable Empty Nesters	Married Couples	1.4%	7.3%	5.5%	6.3%	$75,000	$293,000	123
Small Town Simplicity	Singles	17.6%	11.1%	7.0%	6.0%	$31,500	$15,300	57
Traditional Living	Married Couples	0.0%	2.7%	4.9%	3.7%	$39,300	$33,900	66
In Style	Married Couples w/No Kids	0.0%	2.3%	1.3%	3.3%	$73,000	$165,800	125
Green Acres	Married Couples	0.0%	0.0%	1.4%	2.9%	$76,800	$267,700	128
Old and Newcomers	Singles	4.1%	1.3%	1.8%	2.7%	$44,900	$30,900	76

* The index compares the average amount spent in this market's household budgets to the average amount spent by all US households. An index of 100 is average.

Source: Esri; 4ward Planning Inc., 2018

INVENTORY OF RECREATION AND TOURISM AMENITIES

4WARD PLANNING™

Key Findings: Inventory of Recreation and Tourism Amenities

Higher ratios of historical and recreational amenities

Currently, there is one campground (Adams Croyle), five fishing and boating access points, 10 historical markers, and 21 trailheads within the Little Conemaugh watershed. The ratio of these selected recreational amenities per 100 square miles and per 100,000 population is higher in the watershed than in both the PMA and SMA.

Lower ratios of trails and dedicated open-space amenities

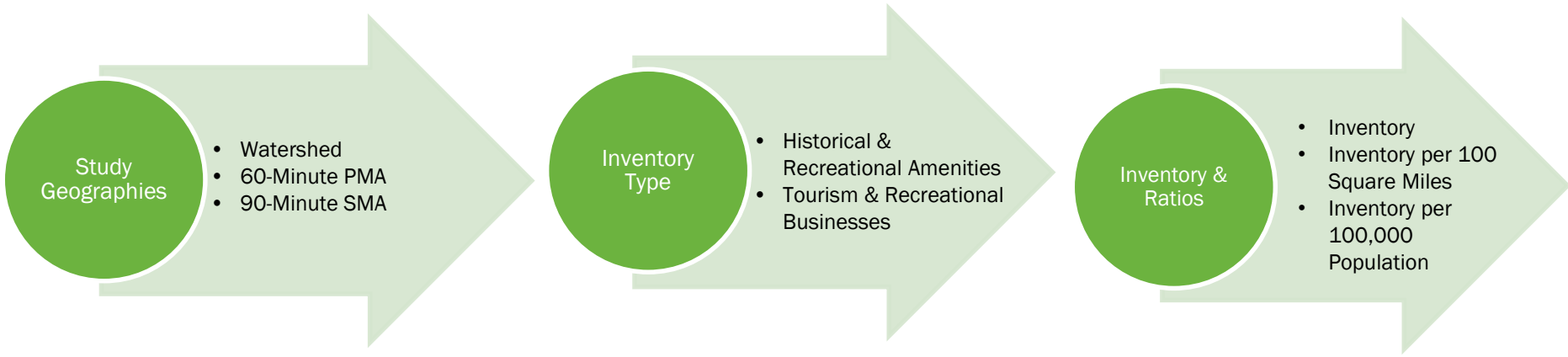
Currently, there are 15 square miles of dedicated open space amenities (includes wild and natural areas, state parks, local parks, state forests, and state gamelands) and 27 miles of trails and greenway trails (includes Staple Bend/Path of the Flood Trail) within the watershed. The ratio of trails and dedicated open space is lower in the watershed than in both the PMA and SMA. However, the miles of trails in the watershed are expected to increase with the expansions of the September 11th National Memorial Trail and the Pennsylvania's Main Line Canal Greenway.

Lower average annual sales among watershed businesses

According to data provided by Esri, there are 10 tourism and recreational businesses and 27 food and beverage stores within the watershed. Consistent with relatively low household income and average household expenditures within the watershed area, the tourism and recreational businesses within the watershed have average annual sales volumes ($319,200) much lower than those within the PMA ($1.0 million) and SMA ($1.4 million). Similarly, food and beverage stores within the watershed have average annual sales volumes ($1.8 million) much lower than those within the PMA ($2.8 million) and SMA ($3.1 million).

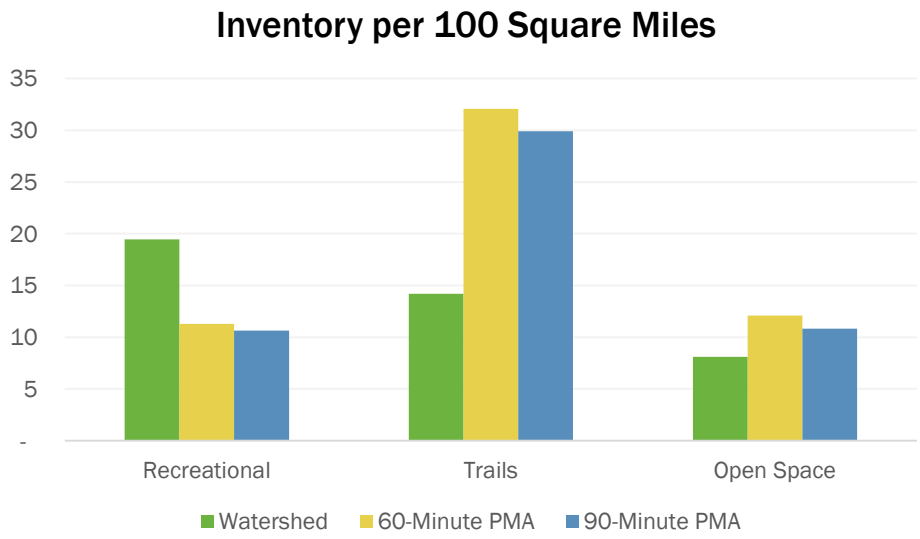
Methodology: Inventory of Recreation and Tourism Amenities

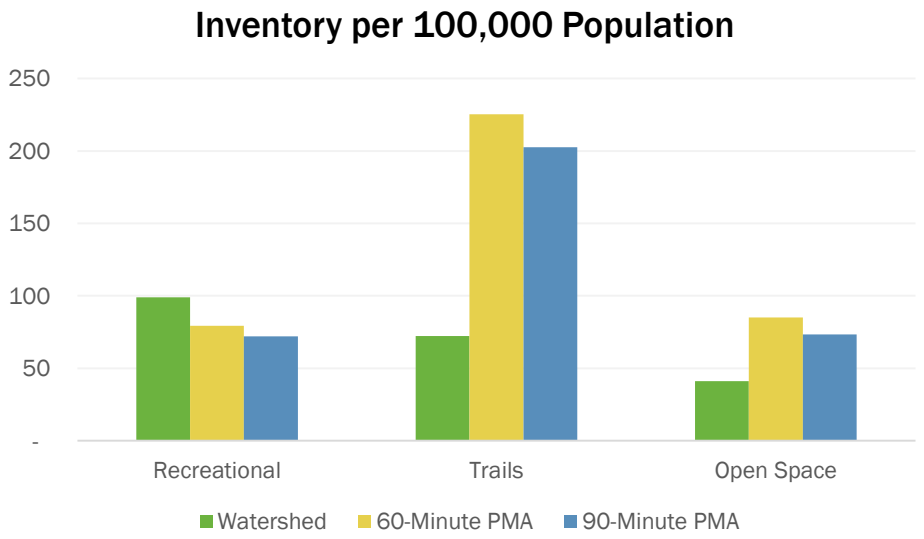
Using business data provided by Esri; historical and natural resource data provided by the Pennsylvania Department of Environmental Protection (DEP), Department of Conservation and Natural Resources (DCNR), Fish and Boat Commission, and Pennsylvania Historical and Museum Commission; and campground data provided by US Campgrounds, 4ward Planning identified the competitive supply of historical, recreational, and tourism amenities and businesses within the watershed and market areas. In order to compare the supply of amenities and businesses across study areas, 4ward Planning calculated the inventory of each amenity or business per 100 square miles and per 100,000 population, based on population and square mileage estimates provided by Esri.



Historical & Recreational Amenities

As provided in more details in the table and maps on the following pages, there is one campground (Adams Croyle), five fishing and boating access points, 10 historical markers, 15 square miles of dedicated open space (includes wild and natural areas, state parks, local parks, state forests, state gamelands), 21 trailheads, and 27 miles of trails within the 190-square-mile Little Conemaugh watershed. As presented in the charts below, the ratio of recreational amenities (including historical markers, campgrounds, fishing and boating access points, and trailheads) per 100 square miles and per 100,000 population is higher in the watershed than in both the PMA and SMA, while the ratios of trails (including trails, greenway trails, and water trails) and open-space amenities (including wild and natural areas, state parks, local parks, state forests, and state gamelands) is lower in the watershed than in both the PMA and SMA.





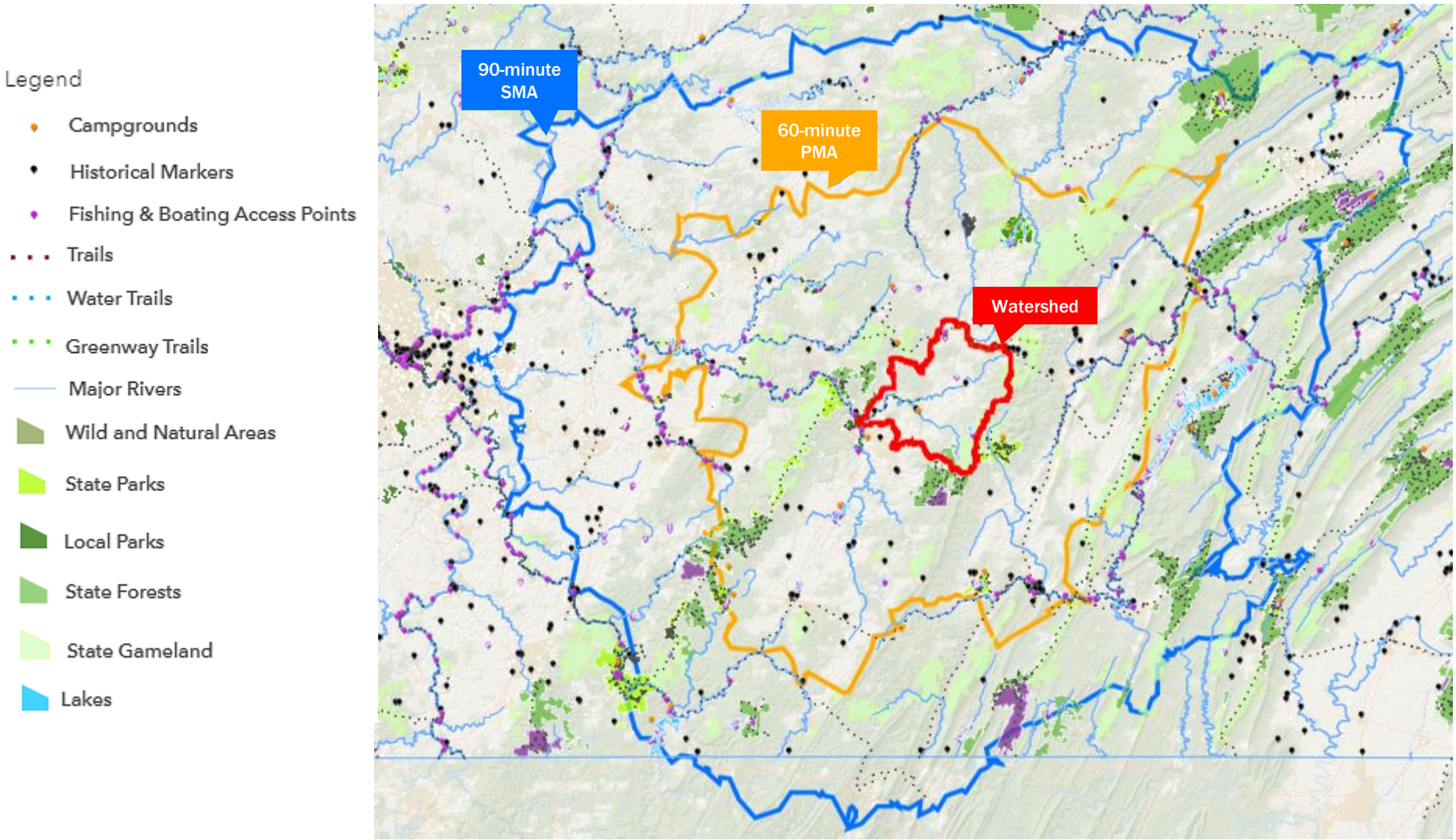
Sources: Pennsylvania State Game Lands for the Management; Pennsylvania Fish and Boat Commission (PFBC); Pennsylvania Spatial Data Access (PASDA); US Campgrounds; Esri; 4ward Planning Inc., 2018

Historical & Recreational Amenities (continued)

	Inventory			Inventory per 100 Square Mile			Inventory per 100,000 Population		
	Watershed	60-Minute PMA	90-Minute SMA	Watershed	60-Minute PMA	90-Minute SMA	Watershed	60-Minute PMA	90-Minute SMA
Recreational									
Historical Markers (Number)	10	62	130	5	2	2	27	14	11
Campgrounds (Number)	1	8	18	1	0	0	3	2	2
Fishing and Boating Access Points (Number)	5	66	155	3	2	2	13	15	13
Trailheads (Number)	21	217	541	11	7	7	56	49	46
Recreational Subtotal	*37*	*353*	*844*	*19*	*11*	*11*	*99*	*79*	*72*
Trails									
Trails (Miles)	16	787	1,964	8	25	25	42	177	168
Greenway Trails (Miles)	11	69	69	6	2	1	31	16	6
Water Trails (Miles)	-	146	339	-	5	4	-	33	29
Trails Subtotal	*27*	*1,002*	*2,373*	*14*	*32*	*30*	*72*	*225*	*203*
Open Space									
Wild and Natural Areas (Sq. Mi.)	-	5	23	-	0	0	-	1	2
State Parks (Sq. Mi.)	-	51	80	-	2	1	-	11	7
Local Parks (Sq. Mi.)	1	2	11	0	0	0	1	1	1
State Forests (Sq. Mi.)	3	63	279	2	2	4	9	14	24
State Gamelands (Sq. Mi.)	12	256	465	6	8	6	31	58	40
Open Space Subtotal	*15*	*378*	*859*	*8*	*12*	*11*	*41*	*85*	*73*
Total Area (Sq. Mi.)	190	3,124	7,932						

Sources: Pennsylvania Spatial Data Access (PASDA); USCampgrounds; Esri; 4ward Planning Inc., 2018

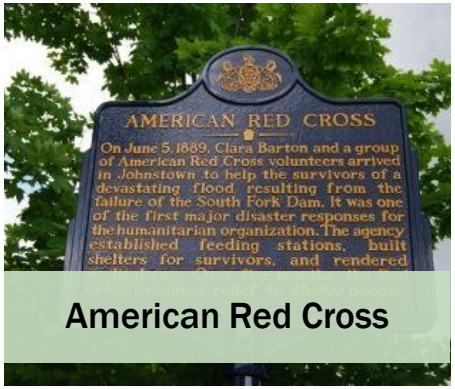
Historical & Recreational Amenities: 90-Minute SMA



Sources: PA Department of Environmental Protection (DEP), PA Department of Conservation and Natural Resources (DCNR); PA Fish and Boat Commission, Pennsylvania Historical and Museum Commission; USCampgrounds; Esri; 4ward Planning Inc., 2018

Historical & Recreational Amenities: Watershed Historical Markers

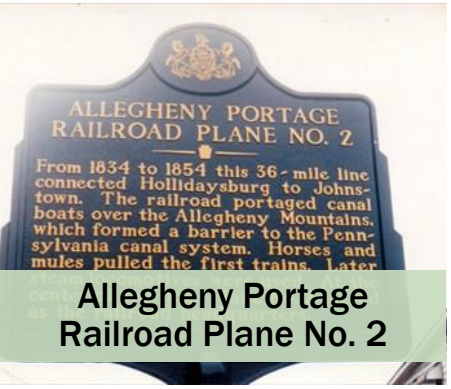
Johnstown Flood (2)



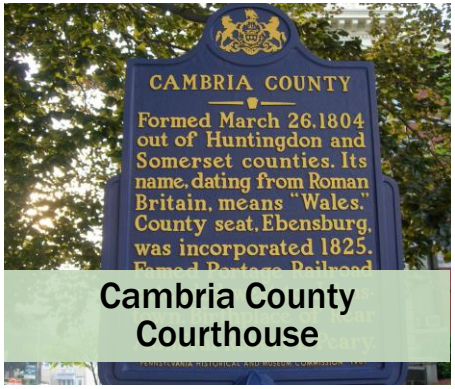
American Red Cross

Sgt. Michael Strank

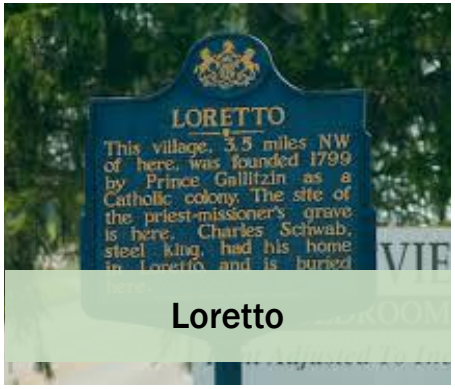
Johnstown Local Flood Protection Project



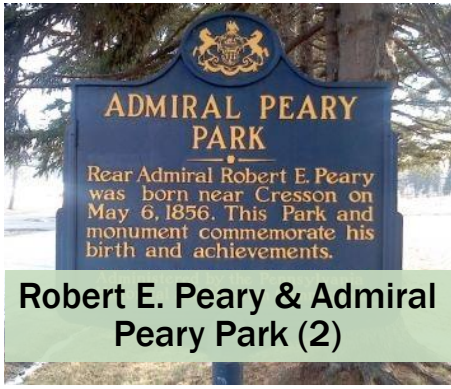
Allegheny Portage Railroad Plane No. 2



Cambria County Courthouse



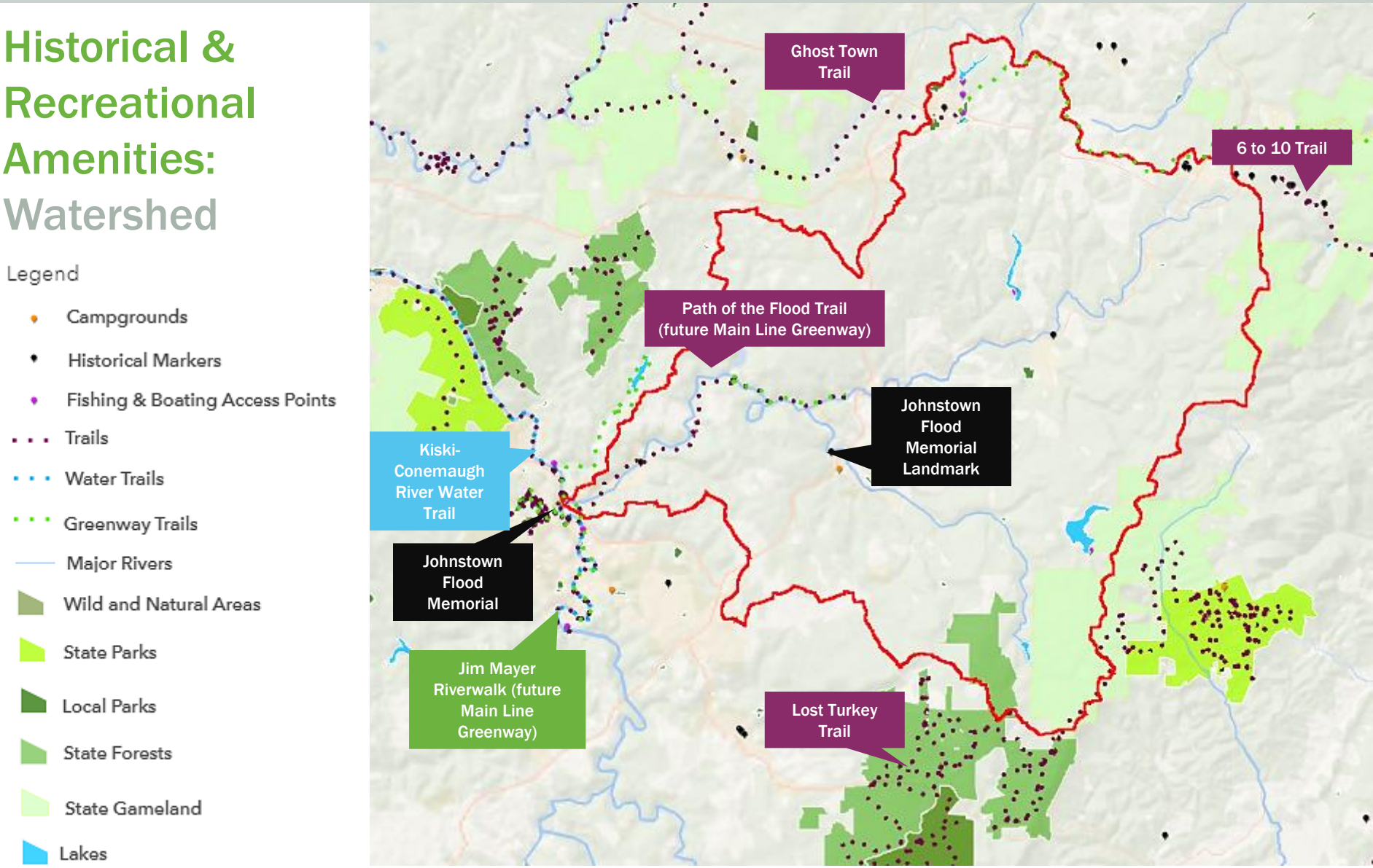
Loretto



Robert E. Peary & Admiral Peary Park (2)

Source: Center for Rural Pennsylvania, Economic Impact of Pennsylvania Heritage Areas, 2014; Esri, Online, 4ward Planning, 2018.

Historical & Recreational Amenities: Watershed



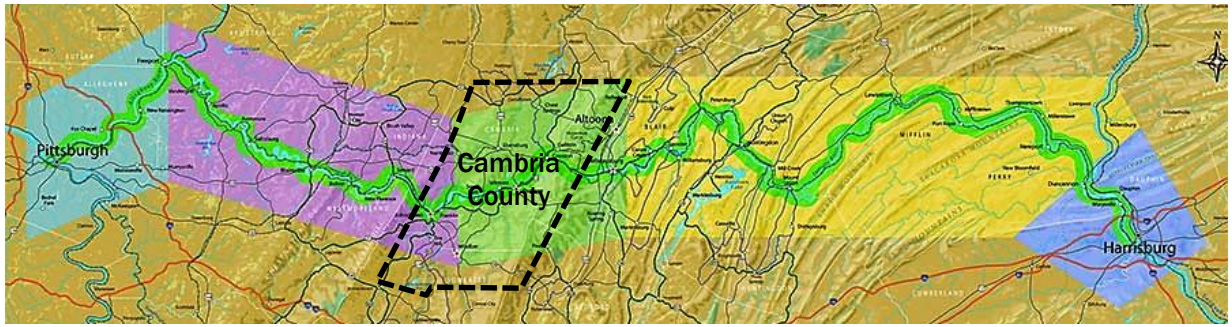
Sources: PA Department of Environmental Protection (DEP), PA Department of Conservation and Natural Resources (DCNR); PA Fish and Boat Commission, Pennsylvania Historical and Museum Commission; USCampgrounds; Esri; 4ward Planning Inc., 2018

Trails In Development

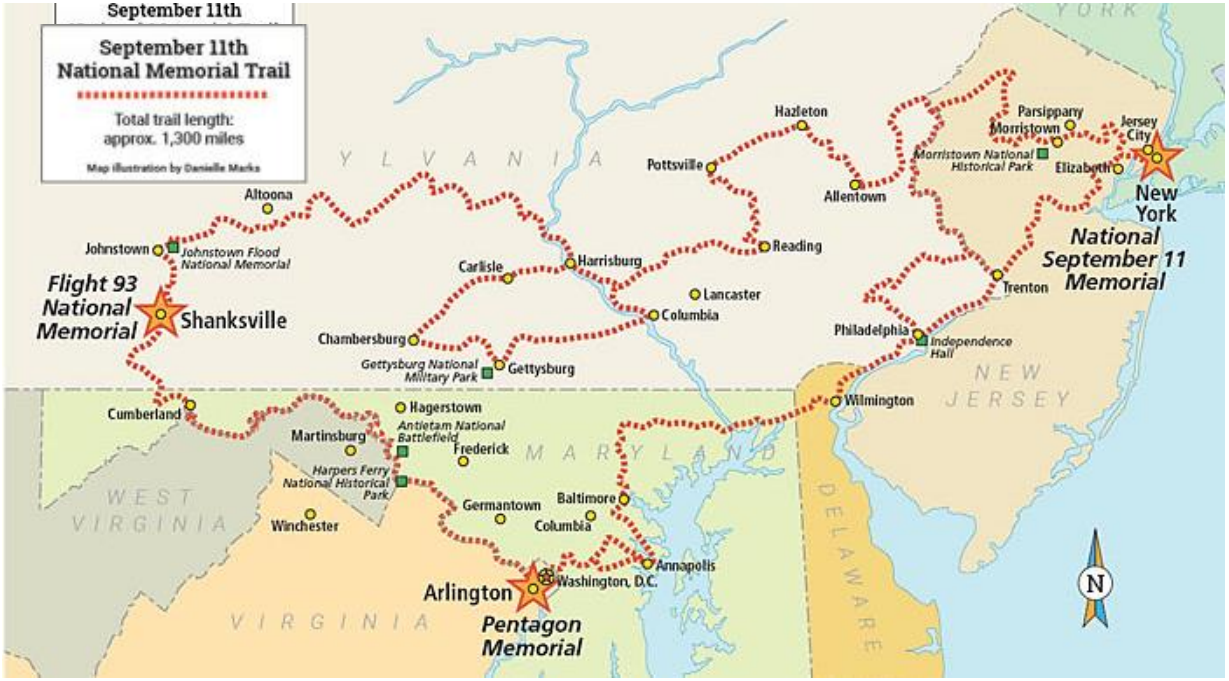
The Little Conemaugh River flows along the Pennsylvania Mainline Canal Greenway, while South Fork to Mineral Point runs along the Path of the Flood rail trail. The Jim Mayer Riverwalk and Path of the Flood trails, located within the watershed, are designated to serve as a link for the September 11th National Memorial Trail and Pennsylvania's Main Line Canal Greenway, currently being planned.

- **Main Line Canal Greenway**, a 320-mile corridor proposed to run from Harrisburg to Pittsburg
- **September 11th National Memorial Trail (NMT),** a 1,300-mile multi-use trail that will run northwest from the Pentagon Memorial, linking to the Flight 93 memorial to Johnstown before extending east to New York City's National September 11 Memorial

September 11th National Memorial Trail



September 11th National Memorial Trail

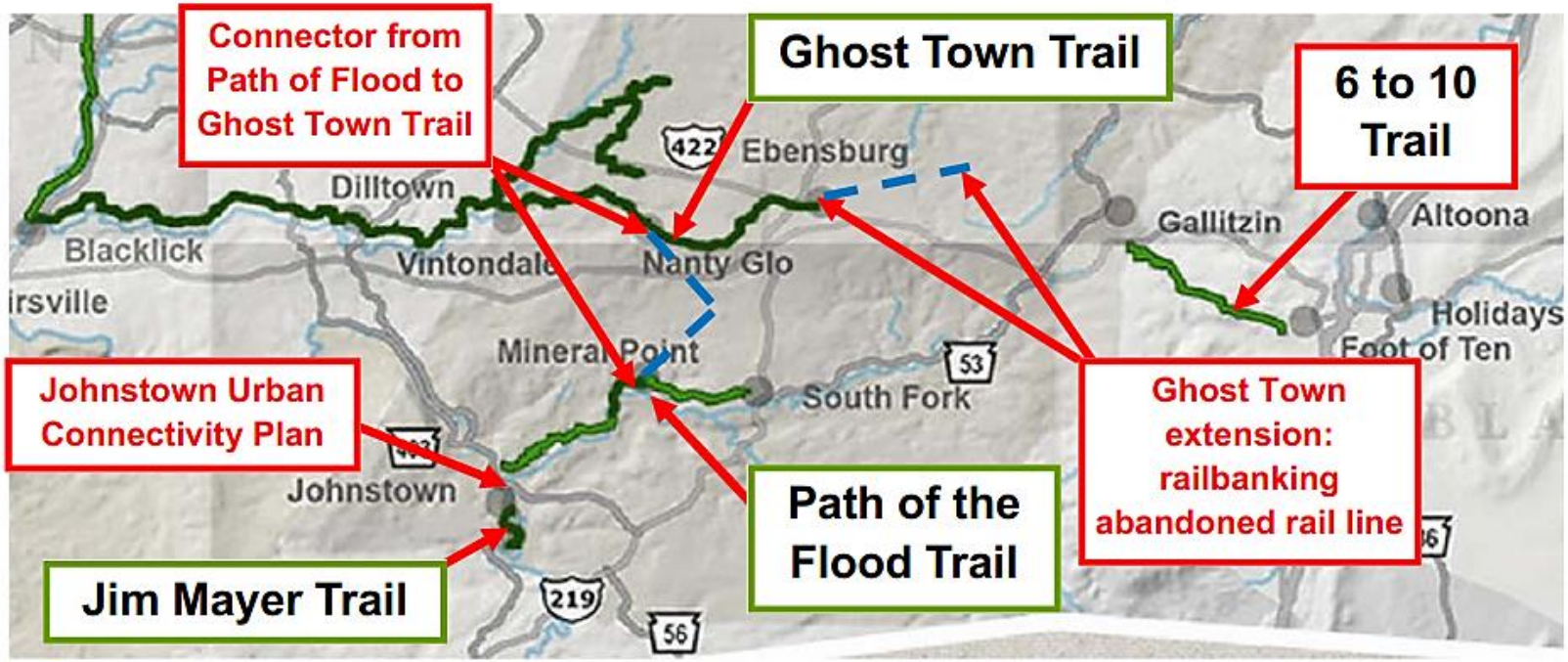


Sources: Esri; 4ward Planning Inc., 2018

Trails In Development (continued)

Several partners are working cooperatively to expand the regional trail network through the Alleghenies to connect three national parks and other historical sites and cultural areas as part of the September 11th National Memorial Trail (9/11 NMT). The map below shows projects currently underway, with existing and open sections of trails in green and extensions in blue. From north to south, they are:

1. Extending the Ghost Town Trail half-way from Ebensburg to Allegheny-Portage Railroad
2. Connecting the Ghost Town and Path of the Flood Trails (part of Johnstown Urban Connectivity Plan)
3. Johnstown Urban Connectivity Plan — in development



Source: Map is taken from the Trans-Allegheny Trail Network

Existing Access: Little Conemaugh River

According to a 2011 study conducted by the Allegheny Ridge Corporation, the Little Conemaugh River is a Class III whitewater run that begins in Lilly and ends in Mineral Point. A paddler could access the Little Conemaugh River from the North Branch and also the South Fork Little Conemaugh River. The Little Conemaugh River is boatable much of the fall through spring season at minimum levels or higher, while heavy rains can make it boatable in the summer as well.

Existing Access:

- Lilly: Put in. Located 0.25 miles upstream on Bear Run (feeder stream) at the PA Rt 53 bridge in Lilly. Lat 40 Deg 25 Min 26 Sec; Lon 78 Deg 37 Min 9 Sec. Possible PennDOT right of way
- Portage: Located at the PA Rt 53 bridge over the Little Conemaugh River on the north edge of Portage. Lat 40 Deg 23 Min 43 Sec; Lon: 78 Deg 40 Min 32 Sec. Possible PennDOT right of way
- Wilmore: Located at the PA Rt 160 Bridge (Main Street) in Wilmore. Lat 40 Deg 23 Min 2 Sec; Lon: 78 Deg 43 Min 11 Sec. Possible PennDOT right of way
- Summerhill: Located at the PA Rt 53 bridge over the Little Conemaugh River on the southwest edge of Summerhill. Lat 40 Deg 22 Min 19 Sec; Lon: 78 Deg 45 Min 59 Sec. Possible PennDOT right of way
- South Fork: Located at the Oak Street Bridge over the Little Conemaugh River between South Fork and Ehrenfeld. Lat 40 Deg 22 Min 3 Sec; Lon: 78 Deg 47 Min 31 Sec. Possible borough right of way
- Mineral Point: Located at the Beech Hill Road Bridge in Mineral Point. Lat 40 Deg 22 Min 45 Sec; Lon: 78 Deg 50 Min 13 Sec. Possible Township Road right of way. Access may also exist at Ehrenfeld Park just upstream from the bridge on River Right.

Source: Allegheny Ridge Corporation, Kiski-Conemaugh Water Trail Mapping Project, Tributary Feasibility Study, September 2011

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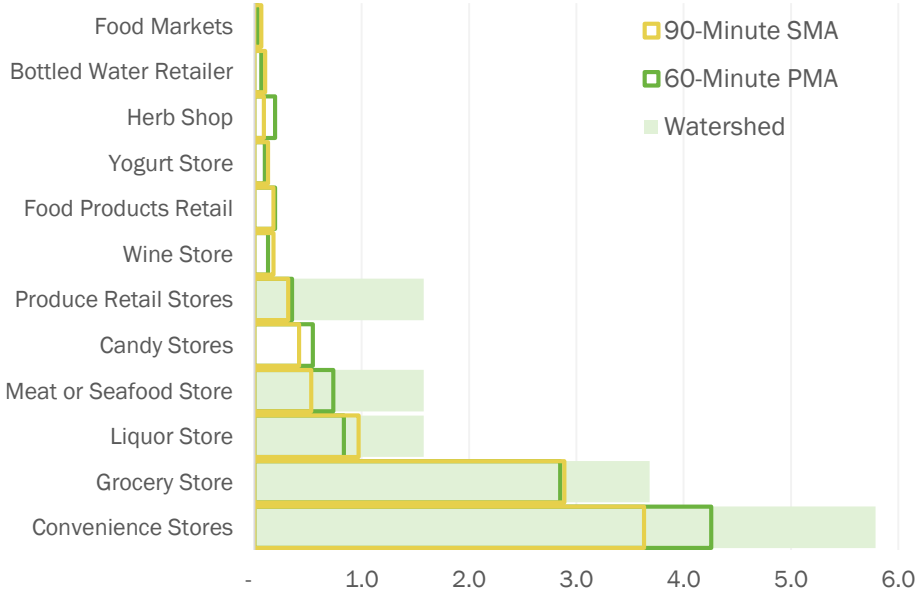
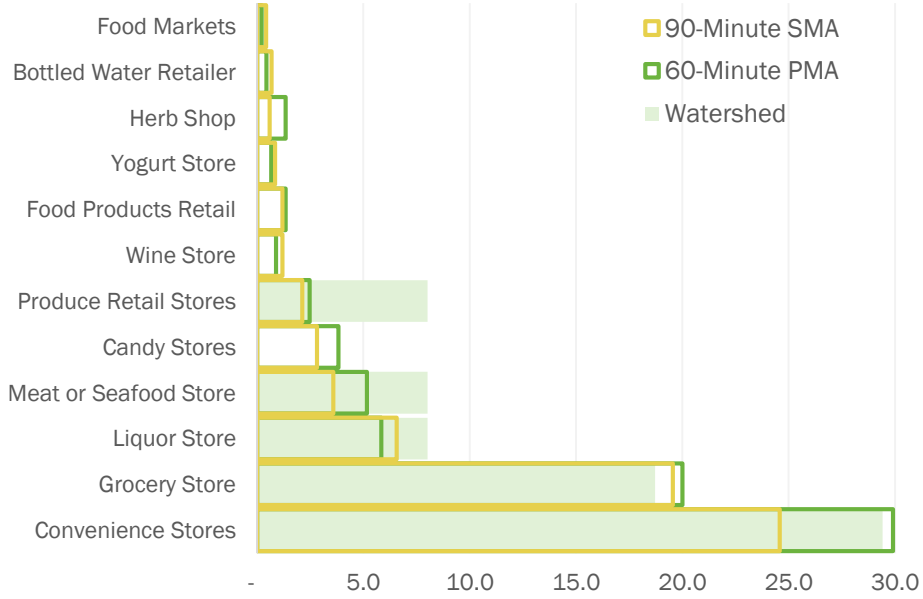
Inventory of Food & Beverage Stores

According to data provided by Esri (illustrated in more detail in the map and table on the following pages), there are just 27 food and beverage stores within the watershed, while there are approximately 330 within the 60-minute PMA and 770 within the 90-minute SMA. As presented in the charts below, while the ratio of convenience stores per 100 square miles is higher in the watershed than in both the PMA and SMA, the ratio of convenience stores per 100,000 population is relatively comparable to that within the PMA. Furthermore, according to data provided by Esri, the food and beverage stores within the watershed have average annual sales volumes ($1.8 million) much lower than those within the PMA ($2.8 million) and SMA ($3.1 million) – suggesting much lower demand than that for the larger region.

Inventory per 100 Square Miles

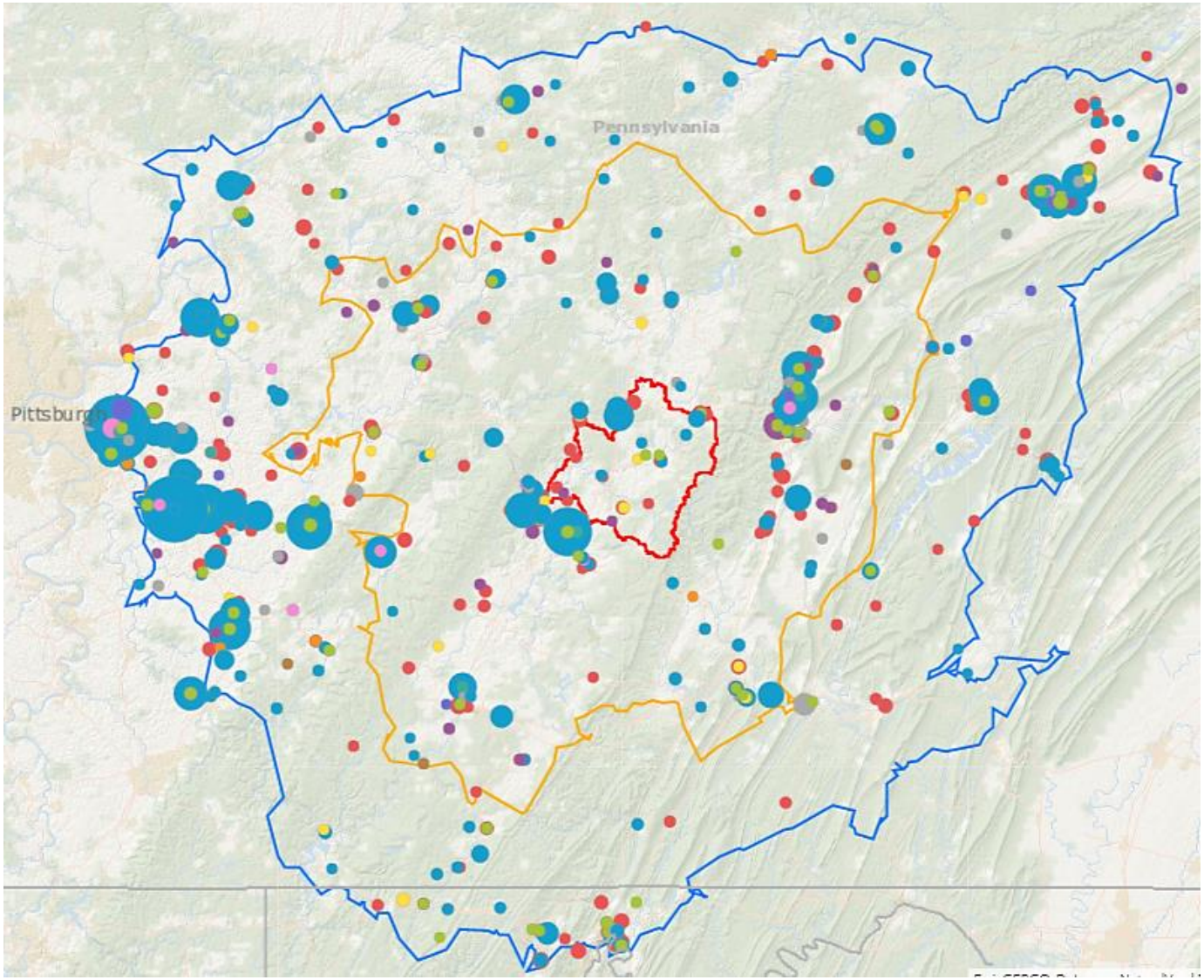


Inventory per 100,000 Population



Sources: Esri; 4ward Planning Inc., 2018

Inventory of Food & Beverage Stores (continued)



Type
- Convenience Stores
- Grocery Store
- Liquor Store
- Meat or Seafood Store
- Candy Stores
- Produce Retail Stores
- Wine Store
- Food Products Retail
- Yogurt Store
- Bottled Water Retailer
- Other

Sales Volume
- > 56,153,000
- 40,000,000
- 30,000,000
- 15,000,000
- < 0

Sources: Esri; 4ward Planning Inc., 2018

Inventory of Food & Beverage Stores (continued)

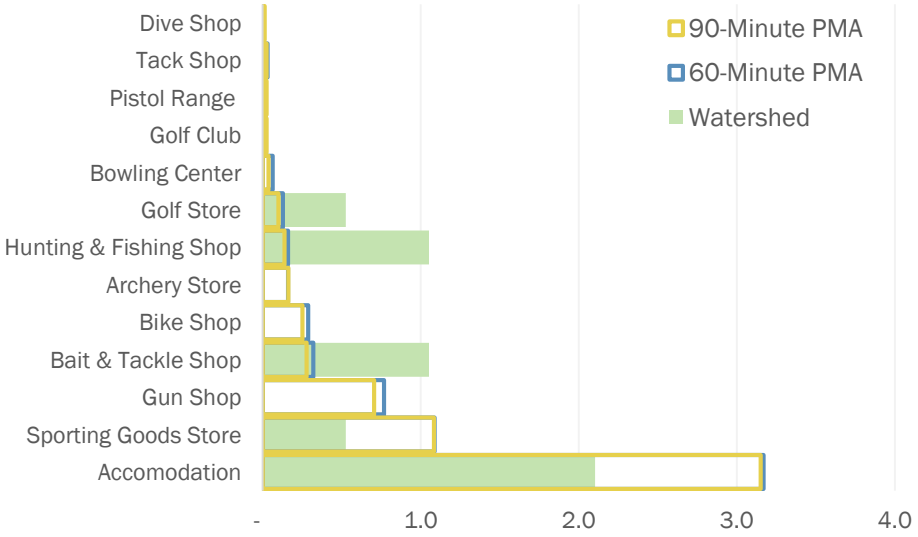
	Inventory			Average Annual Sales			Inventory per 100 Square Mile			Inventory per 100,000 Population		
	Watershed	PMA	SMA	Watershed	PMA	SMA	Watershed	PMA	SMA	Watershed	PMA	SMA
Convenience Stores	11	133	288	$2,297,909	$2,443,833	$2,256,233	5.8	4.3	3.6	29.4	29.9	24.6
Grocery Store	7	89	229	$1,526,571	$5,428,000	$6,593,720	3.7	2.8	2.9	18.7	20.0	19.5
Liquor Store	3	26	77	$501,667	$851,062	$1,186,682	1.6	0.8	1.0	8.0	5.8	6.6
Meat or Seafood Store	3	23	42	$3,210,000	$2,052,117	$1,423,625	1.6	0.7	0.5	8.0	5.2	3.6
Candy Stores	-	17	33	-	$300,769	$323,680	-	0.5	0.4	-	3.8	2.8
Produce Retail Stores	3	11	25	$555,000	$528,625	$466,312	1.6	0.4	0.3	8.0	2.5	2.1
Wine Store	-	4	14	-	$1,850,500	$2,183,000	-	0.1	0.2	-	0.9	1.2
Food Products Retail	-	6	14	-	$1,347,200	$1,093,416	-	0.2	0.2	-	1.3	1.2
Yogurt Store	-	3	10	-	$519,000	$456,000	-	0.1	0.1	-	0.7	0.9
Herb Shop	-	6	7	-	$222,250	$222,250	-	0.2	0.1	-	1.3	0.6
Bottled Water Retailer	-	2	8	-	$631,000	$2,347,285	-	0.1	0.1	-	0.4	0.7
Food Markets	-	1	5	-	$7,093,000	$3,159,000	-	0.0	0.1	-	0.2	0.4
Dairy Product Store	-	2	5	-	$268,000	$199,000	-	0.1	0.1	-	0.4	0.4
Farm Markets	-	3	5	-	$586,500	$536,000	-	0.1	0.1	-	0.7	0.4
Gourmet Shop	-	3	4	-	$235,500	$182,666	-	0.1	0.1	-	0.7	0.3
Snack Products	-	-	4	-	-	$557,333	-	-	0.1	-	-	0.3
Coffee & Tea Store	-	-	2	-	-	$131,000	-	-	0.0	-	-	0.2
Cheese Store	-	-	1	-	-	$53,000	-	-	0.0	-	-	0.1
Wine Tasting Room	-	-	1	-	-	$1,213,000	-	-	0.0	-	-	0.1
Grand Total	27	329	774	$1,618,229	$1,623,824	$1,293,853	14.2	10.5	9.8	72.2	74.0	66.1

Sources: Esri; 4ward Planning Inc., 2018

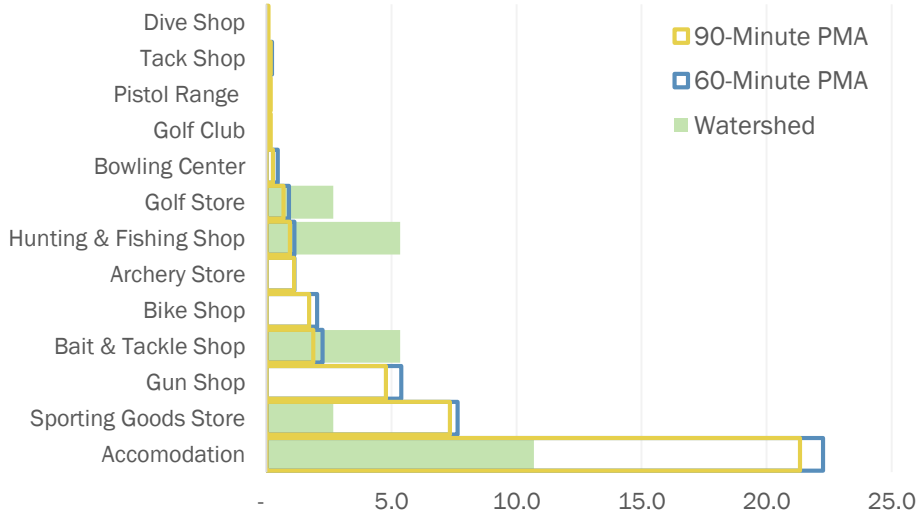
Inventory of Tourism & Recreational Businesses

According to data provided by Esri (illustrated in more detail in the table and map on the following pages), there are just 10 tourism and recreational businesses within the watershed, while there are approximately 190 within the 60-minute PMA and 480 within the 90-minute SMA. As presented in the charts below, the ratio of hunting and fishing shops, bait and tackle shops, and golf store businesses per 100 square miles and per 100,000 population is higher in the watershed than in both the PMA and SMA, while the ratios of other tourism and recreational businesses (accommodation and sporting good stores, in particular) is higher in both the PMA and SMA. Furthermore, according to data provided by Esri, the tourism and recreational businesses within the watershed have average annual sales volumes ($31,920) significantly lower than those within the PMA ($1.0 million) and SMA ($1.4 million). This would stand to reason, as the watershed's population is relatively small and declining.

Inventory per 100 Square Miles

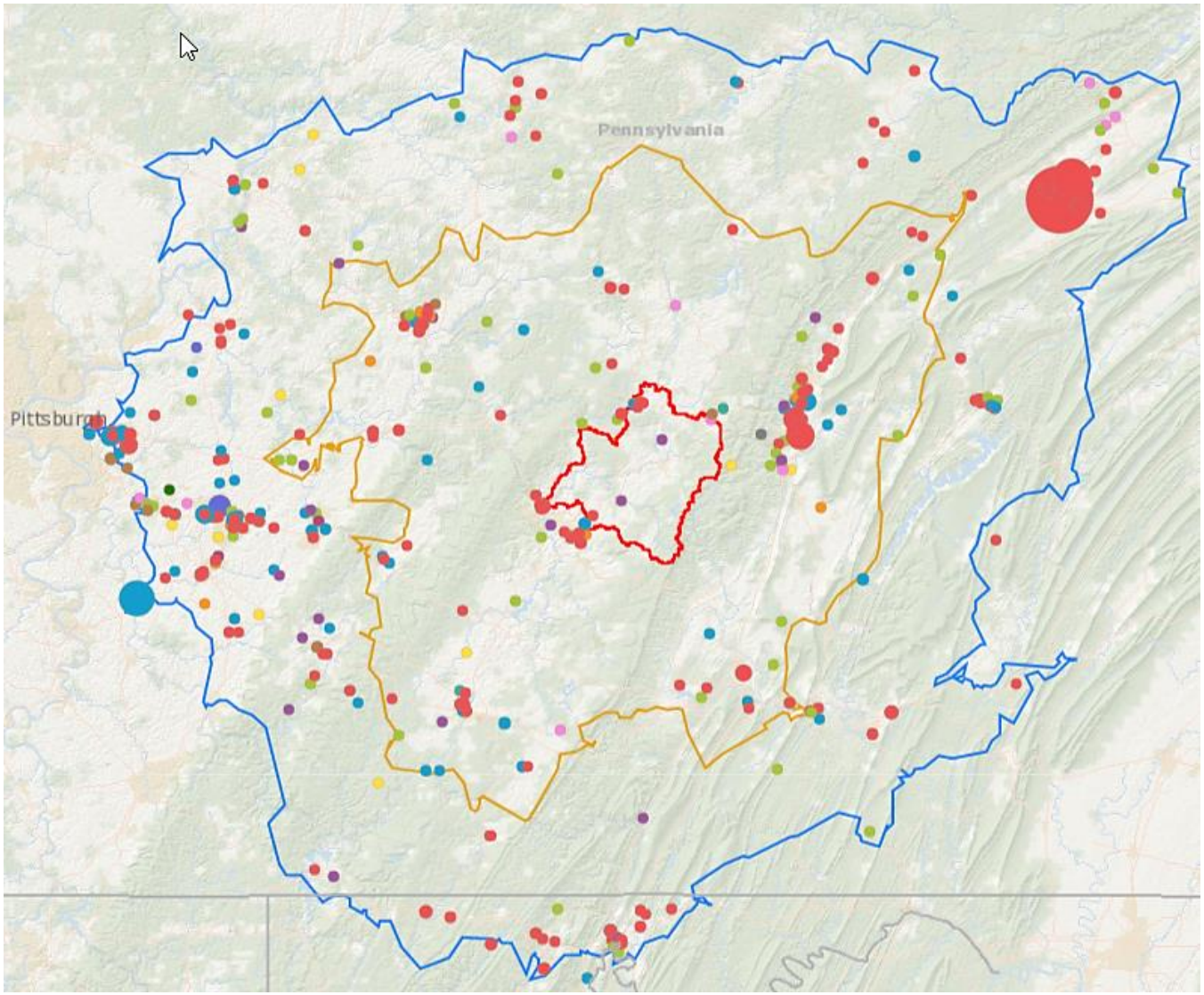


Inventory per 100,000 Population



Sources: Esri; 4ward Planning Inc., 2018

Inventory of Tourism & Recreational Businesses (continued)



Type
- Accomodation
- Sporting Goods Store
- Gun Shop
- Bait & Tackle Shop
- Bike Shop
- Archery Store
- Hunting & Fishing Shop
- Golf Store
- Bowling Center
- Golf Club
- Pistol Range
- Tack Shop
- Dive Shop

Sales Volume
- > 68,046,000
- 50,000,000
- 35,000,000
- 20,000,000
- < 0

Sources: Esri; 4ward Planning Inc., 2018

Inventory of Tourism & Recreational Businesses (continued)

	Inventory			Average Annual Sales			Inventory per 100 Square Mile			Inventory per 100,000 Population		
	Watershed	PMA	SMA	Watershed	PMA	SMA	Watershed	PMA	SMA	Watershed	PMA	SMA
Accomodation	4	99	250	$426,000	$1,485,737	$1,776,276	2.1	3.2	3.2	10.7	22.3	21.3
Sporting Goods Store	1	34	86	$343,000	$974,617	$1,929,058	0.5	1.1	1.1	2.7	7.6	7.3
Gun Shop	-	24	56	-	$309,958	$281,035	-	0.8	0.7	-	5.4	4.8
Bait & Tackle Shop	2	10	22	$172,000	$238,800	$314,500	1.1	0.3	0.3	5.3	2.2	1.9
Bike Shop	-	9	20	-	$250,667	$513,450	-	0.3	0.3	-	2.0	1.7
Archery Store	-	5	13	-	$228,400	$177,615	-	0.2	0.2	-	1.1	1.1
Hunting & Fishing Shop	2	5	11	$286,000	$384,200	$309,545	1.1	0.2	0.1	5.3	1.1	0.9
Golf Store	1	4	8	$229,000	-	$234,125	0.5	0.1	0.1	2.7	0.9	0.7
Bowling Center	-	2	3	-	$176,500	$214,000	-	0.1	0.0	-	0.4	0.3
Golf Club	-	-	2	-	-	$7,344,500	-	-	0.0	-	-	0.2
Pistol Range	-	-	2	-	-	$723,000	-	-	0.0	-	-	0.2
Tack Shop	-	1	2	-	$349,000	$391,500	-	0.0	0.0	-	0.2	0.2
Dive Shop	-	-	1	-	-	$145,000	-	-	0.0	-	-	0.1
Grand Total	10	193	476	$1,456,000	$4,397,879	$14,353,604	5.3	6.2	6.0	26.7	43.4	40.6
Average				$319,200	$1,020,378	$1,403,752						

Sources: Esri; 4ward Planning Inc., 2018

ECONOMIC IMPACTS OF ECOSYSTEM RESTORATION

ECONOMIC AND REAL ESTATE ANALYSIS FOR SUSTAINABLE LAND USE OUTCOMES ™

4WARD PLANNING™

Restoration Project Case Studies

Key Findings: Economic Impacts of Ecosystem Restoration

65 percent of total project expenditures occur locally

On average, 65 percent of total project expenditures among the six case study ecosystem restoration projects occured locally, although this share ranged widely by project. For many projects, contractors and suppliers from both within and outside the local economy were used.

13 full- and part-time jobs per every $1 million spent

For every million dollars spent locally, these projects supported approximately 13 annualized full- and part-time jobs accumulated over the duration of a restoration project.

$776,260 in labor income per every $1 million spent

For every million dollars spent locally, these projects generated $776,260 in labor income, which includes employee wages and salaries and payroll benefits, as well as the incomes of sole proprietors.

$897,150 in value added per every $1 million spent

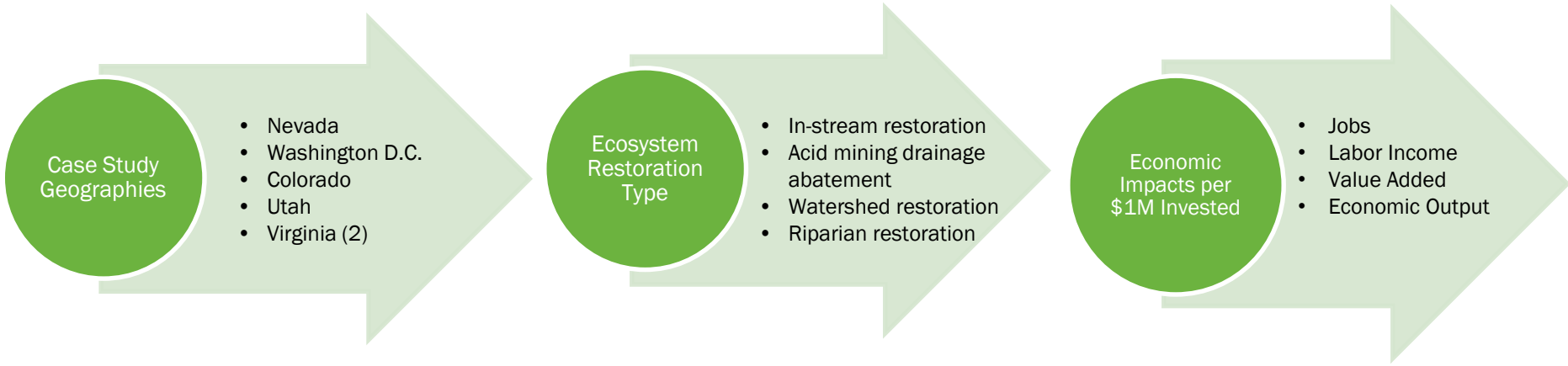
For every million dollars spent locally, these projects generated $897,150 in value added, which is an equivalent measure to Gross Domestic Product (GDP) - the measure used to value the goods and services produced each year.

$1.65 million in economic output per every $1 million spent

For every million dollars spent locally, these projects generated $1.65 million in economic output, which measures the total estimated value of the production of goods and services supported by project expenditures, and is equal to the sum of all intermediate sales (i.e., business-to-business sales) and final demand (i.e., sales to consumers).

Methodology: Restoration Project Case Studies

In order to better understand the range of temporary economic impacts from ecosystem restoration efforts in the Little Conemaugh watershed, 4ward Planning utilized case study data provided by the *Economic Impacts of Ecosystem Restoration* project, to identify six national ecosystem restoration case study projects representing a range of restoration types (in-stream restoration, acid mining drainage abatement, watershed restoration, and riparian restoration). Based on local area project expenditures (2018 dollars) and economic impacts (e.g., jobs, labor income, value added, and economic output), 4ward Planning identified local area economic impacts per million dollars invested.



Restoration Project Case Studies

According to selected case study data provided by the Economic Impacts of Ecosystem Restoration project (presented below and in more detail on the following slides), ecosystem restoration projects can inject significant investment into a local economy. On average, 65 percent of total project expenditures for these projects was spent locally, although this share ranged widely by project. While contractors and suppliers within larger, diverse economies (e.g. Washington, D.C) may be easily hired locally, projects located in smaller, less diverse economies may have to hire specialized service providers from outside the local area. For example, from 2006 to 2010, 64 percent ($13.6 million) of the $21 million Truckee River Restoration Project located in Lake Tahoe, Nevada was spent locally (here defined as within the 60-mile radius area).

Restoration Project Case Study Impacts: 2006-2014

Name	State	Local Area	Project Period	Restoration Type	Total Project Exp.	Local Project Exp.	% Local Project Exp.
Truckee River Restoration Project	Nevada	60-mile radius	2006-2010	In-stream restoration	$21,071,740	$13,587,080	64%
Watts Branch Urban Stream Restoration	Washington, D.C.	20 counties	2010-2011	In-stream restoration	$3,417,440	$3,346,420	98%
California Gulch NRDAR Dinero Tunnel Acid-Mine Drainage Pathway Elimination Restoration	Colorado	3 counties	2006-2014	Acid mine drainage abatement	$1,371,640	$125,080	9%
Color Country Duncan Creek Restoration	Utah	5 counties	2012-2012	Watershed restoration	$1,101,340	$410,220	37%
Lone Mountain NRDAR Acid Mine Drainage Restoration	Virginia	60-mile radius	2010-2011	Acid mine drainage abatement	$492,900	$307,400	62%
Lone Mountain NRDAR Pennington Gap Riparian Restoration and Community Park Development Restoration	Virginia	60-mile radius	2011-2014	Riparian restoration	$98,580	$49,820	51%
Average					**$4,592,273**	**$2,971,003**	**65%**

Sources: U.S. Department of the Interior, U.S. Geological Survey, DOI Inspector General, Economic Impacts of Ecosystem Restoration

Restoration Project Case Study Impacts

On average, for every million dollars spent locally, case study restoration projects supported approximately 13 jobs (the total number of annualized full and part-time jobs accumulated over the duration of a restoration project), and generated $776,260 in labor income, $897,150 in value added (equivalent to Gross Domestic Product) and $1.65 in economic output (value of the production of goods and services supported by project expenditures). While an economic impact analysis of the $24 million Ehrenfeld or the $31 million St. Michael projects have not been conducted to date, both projects have had significant impacts on the local economy (e.g. the Ehrenfeld project employed 40 previously furloughed miners for 18 to 36 months). It is expected that the $21.7 million Little Conemaugh AMD treatment facility will also significantly contribute to the local economy.

Restoration Project Case Study Impacts per $1M: 2006-2014

Project Characteristics			Local Economic Impacts per $1M (2018 dollars)			
Name	Restoration Type	Local Project Expenditures	Jobs	Labor Income	Value Added	Economic Output
Truckee River Restoration Project	In-stream restoration	$13,587,080	13.6	$1,085,115	NA	$1,085,115
Watts Branch Urban Stream Restoration	In-stream restoration	$3,346,420	13.3	$865,695	$1,134,305	$2,012,987
California Gulch NRDAR Dinero Tunnel Acid-Mine Drainage Pathway Elimination Restoration	Acid mine drainage abatement	$125,080	16.0	$991,525	$1,076,271	$1,745,763
Color Country Duncan Creek Restoration	Watershed restoration	$410,220	12.2	$733,850	$948,320	$1,788,114
Lone Mountain NRDAR Acid Mine Drainage Restoration	Acid mine drainage abatement	$307,400	7.5	$406,897	$603,448	$1,472,414
Lone Mountain NRDAR Pennington Gap Riparian Restoration and Community Park Development Restoration	Riparian restoration	$49,820	18.1	$574,468	$723,404	$1,829,787
Average		**$2,971,003**	**13.4**	**$776,258**	**$897,150**	**$1,655,697**

Sources: U.S. Department of the Interior, U.S. Geological Survey, DOI Inspector General, Economic Impacts of Ecosystem Restoration

Restoration Project Case Studies

The graphic below summarizes case study projects.

Color Country Duncan Creek Restoration

- Increasing number of homes are located in the wildland-urban interface.
- Restoration efforts are focused on both habitat improvement and fire/fuels reduction.
- This case study focuses on restoration activities accomplished on 2,080 acres of public and private lands.

Truckee River Restoration Project

- A century of man-made changes have heavily degraded the river system, leaving it inundated with invasive weeds.

  The restoration work involves treating noxious weeds and replanting with native vegetation to help stabilize the river banks and reduce sediment loads.

Watts Branch Urban Stream Restoration

- The Anacostia Watershed is considered by many to be one of the most degraded waterways in the United States.
- The main focus of this project was to restore the eroded stream channel, which was responsible for depositing nearly 1,500 tons of sediment into the Anacostia Watershed each year.

Lone Mountain NRDAR Acid Mine Drainage Restoration

- Flows or seeps from these abandoned coal mines have long degraded the waters of the Powell River watershed.
- To neutralize acid mine drainage at the three project sites, passive limestone treatment systems were built to raise the pH of the acid mine drainage.

California Gulch NRDAR Dinero Tunnel Acid-Mine Drainage Pathway Elimination Restoration

- Acid mine drainage from the Dinero Tunnel has significantly affected downstream waters.
- The Dinero Tunnel Acid Mine Drainage Pathway Elimination Project addressed problematic acid mine drainage through the installation of a concrete bulkhead deep inside the tunnel.

Lone Mountain NRDAR Pennington Gap Riparian Restoration and Community Park Development Restoration

- To restore habitat lost in the Lone Mountain coal slurry spill, the plan calls for habitat restoration to improve existing stream conditions, particularly by stabilizing streambanks in problem areas and planting riparian buffers throughout the watershed.

Sources: U.S. Department of the Interior, U.S. Geological Survey, DOI Inspector General, www.fort.usgs.gov/economic-impacts-restoration

Little Conemaugh AMD Project

Key Findings: Economic Impacts of Little Conemaugh AMD Project

100 percent of total project expenditures occur locally

According to the Pennsylvania Bureau of Mine Reclamation, 100 percent of contractors associated with construction of the $21.7 million treatment facility are expected to come from within a 60-mile radius of the watershed (e.g., between State College and Pittsburgh). According to IMPLAN's local purchase assumptions for Cambria County, approximately 81 percent of the $21.7 million in direct investment ($17.6 million) could be absorbed by existing industries within the County.

12 to 13 full- and part-time jobs per every $1 million spent

For every million dollars spent locally, the Little Conemaugh watershed project is expected to support between 12 and 13 annualized full- and part-time jobs accumulated over the duration of the restoration project (two years).

$526,650 to $563,200 in labor income per every $1 million spent

For every million dollars spent locally, this project is expected to generate between $526,650 and $563,200 in labor income (e.g. employee wages, salaries and payroll benefits, as well as the incomes of sole proprietors).

$771,750 to $838,770 million in value added per every $1 million spent

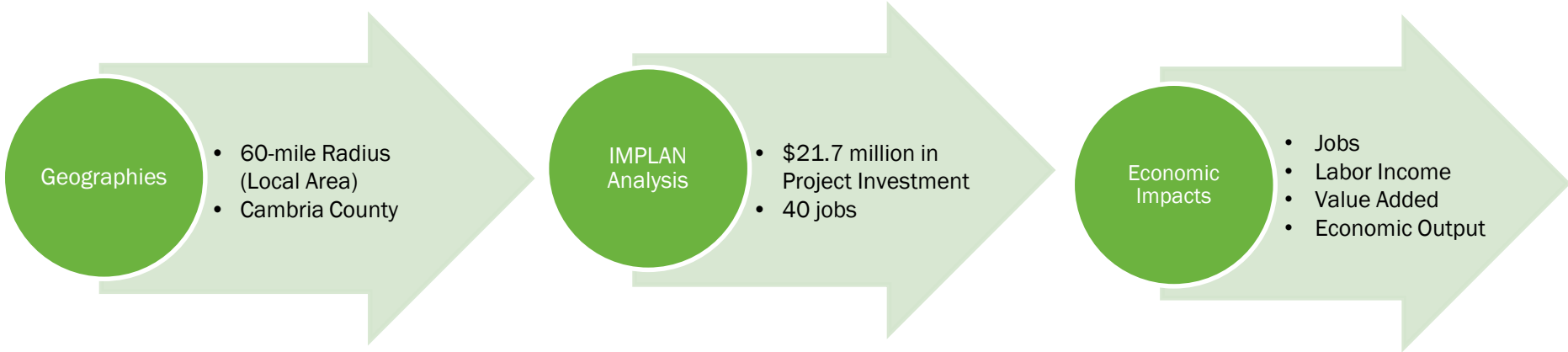
For every million dollars spent locally, this project is expected to generate between $771,750 and $838,770 in value added (e.g. equivalent measure to Gross Domestic Product, used to value the goods and services produced).

$1.5 to $1.6 million in economic output per every $1 million spent

For every million dollars spent locally, this project is expected to generate between $1.5 and $1.6 million in economic output (e.g. the total estimated value of the production of goods and services supported by expenditures).

Methodology: Economic Impacts of Little Conemaugh AMD Project

According to the Bureau of Mine Reclamation, the estimated capital project cost for the Little Conemaugh's AMD treatment facility is $21.7 million, which will take approximately 18 months with construction of the facility projected to begin in 2022. During the construction phase, the project is estimated to support 40 jobs. All contractors associated with construction of the treatment facility are expected to come from within a 60-mile radius of the watershed (e.g. between State College and Pittsburgh). After purchasing the most recent data for the Cambria County (2016), 4ward Planning utilized IMPLAN Professional 3.1, a widely used economic impact assessment software system (presented in more detail in the Appendix), to evaluate the prospective economic impact of construction of the treatment facility (e.g. jobs, labor income, value added, and economic output). Using job estimates provided by the Bureau of Mine Reclamation, 4ward Planning broke out investment across a two year period (2022 to 2023) based on the following IMPLAN's sector categories: Sector 58: Construction of other new nonresidential structures and Sector 395: Wholesale trade. For modeling purposes, 4ward Planning assumed two impact scenarios: 1) one assuming 100 percent of investment is captured within Cambria County and 2) another utilizing IMPLAN's regional purchase coefficients (local purchase percentage) for the county (coefficients are derived from available data and represent typical allocation of expenditures for a commodity in a given area). All dollar values are presented in 2018 dollars.



Restoration: Economic Impacts of Little Conemaugh (100% Capture)

Assuming that 100 percent of the $21.7 million in direct investment during project restoration (from 2022 to 2023) is captured in Cambria County, this investment could support 70 total full and part-time jobs per year, and generate $6.1 million in labor income, $9.1 million in value added, $17.8 million in economic output within the local area. On average, for every million dollar spent locally, the Little Conemaugh AMD project could support approximately 13 jobs (accumulated over the duration of a restoration project), and generated $563,200 in labor income, $838,770 in value added and $1.6 million in economic output. Overall, the project is expected to have relatively comparable impacts per million dollar spent when compared to the average case study restoration project (presented in more detail the previous section).

Little Conemaugh Acid Mine Drainage Restoration Impact per $1M: 2022-2023 (100% Capture)

Year	Total Project Expenditures	Local Project Expenditures	% Share Local Project Expend.	Local Economic Impacts (60-mile Radius)				Local Economic Impact per $1M (60-miles)			
				Jobs	Labor Income	Value Added	Economic Output	Jobs	Labor Income	Value Added	Economic Output
2022	$10,850,000	$10,850,000	100%	70	$3,058,336	$4,556,008	$8,892,987	6	$281,874	$419,909	$819,630
2023	$10,850,000	$10,850,000	100%	70	$3,052,409	$4,544,645	$8,873,423	6	$281,328	$418,861	$817,827
Total	$21,700,000	$21,700,000	100%	140	$6,110,745	$9,100,653	$17,766,410	13	$563,202	$838,770	$1,637,457
Average Case Study	$4,592,273	$2,971,003	65%	40	$3,036,547	$908,208	$3,829,250	13	$776,258	$897,150	$1,655,697

Sources: U.S. Department of the Interior, U.S. Geological Survey, DOI Inspector General, www.fort.usgs.gov/economic-impacts-restoration; IMPLAN, 4wrd Planning, Inc., 2018.

Restoration: Economic Impacts of Little Conemaugh (81% Capture)

Applying IMPLAN's local purchase assumptions for Cambria County, approximately 81 percent of the $21.7 million in direct investment ($17.6 million) would be absorbed within Cambria County. As a result, project restoration could support 66 total full and part-time jobs per year (43 direct, 9 indirect and 14 induced), and generate $5.7 million in labor income, $8.4 million in value added, $16.5 million in economic output within the local area. On average, for every million dollar spent locally, the Little Conemaugh AMD project is expected to support approximately 12 jobs (accumulated over the duration of a restoration project), and generated $526,650 in labor income, $777,750 in value added and $1.5 in economic output. With this reduction in local economic capture, the project would have relatively less impacts per million dollar spent when compared to the average case study restoration project.

Little Conemaugh Acid Mine Drainage Restoration Impact per $1M: 2022-2023 (81% Capture)

Year	Total Project Expenditures	Local Project Expenditures	% Share Local Project Expend.	Local Economic Impacts (60-mile Radius)				Local Economic Impact per $1M (60-miles)			
				Jobs	Labor Income	Value Added	Economic Output	Jobs	Labor Income	Value Added	Economic Output
2022	$10,850,000	$8,799,045	100%	66	$2,859,017	$4,190,501	$8,250,357	6	$263,504	$386,221	$760,402
2023	$10,850,000	$8,799,045	100%	66	$2,855,096	$4,182,982	$8,237,413	6	$263,142	$385,528	$759,209
Total	$21,700,000	$17,598,090	81%	132	$5,714,113	$8,373,483	$16,487,770	12	$526,646	$771,750	$1,519,610
Average Case Study	$4,592,273	$2,971,003	65%	40	$3,036,547	$908,208	$3,829,250	13	$776,258	$897,150	$1,655,697

Sources: U.S. Department of the Interior, U.S. Geological Survey, DOI Inspector General, www.fort.usgs.gov/economic-impacts-restoration; IMPLAN, 4wrd Planning, Inc., 2018.

TOURISM AND VISITOR SPENDING

4WARD PLANNING™

Allegheny Ridge Heritage Area

Key Findings: Allegheny Ridge Tourism and Visitor Spending

Located within the Allegheny Ridge Heritage Area

The Little Conemaugh watershed is located within the Allegheny Ridge Heritage Area and the Main Line Canal Greenway, a 320-mile corridor running from Harrisburg to Pittsburg and including portions of Cambria County. According to 2014 visitor surveys conducted by the Center for Rural Pennsylvania two of the top 30 attractions within the Allegheny Ridge are located within the Little Conemaugh watershed, including the Staple Bend Tunnel and the Johnstown Flood Memorial.

Non-local visitors spend between $122 to $283 per day per travel party

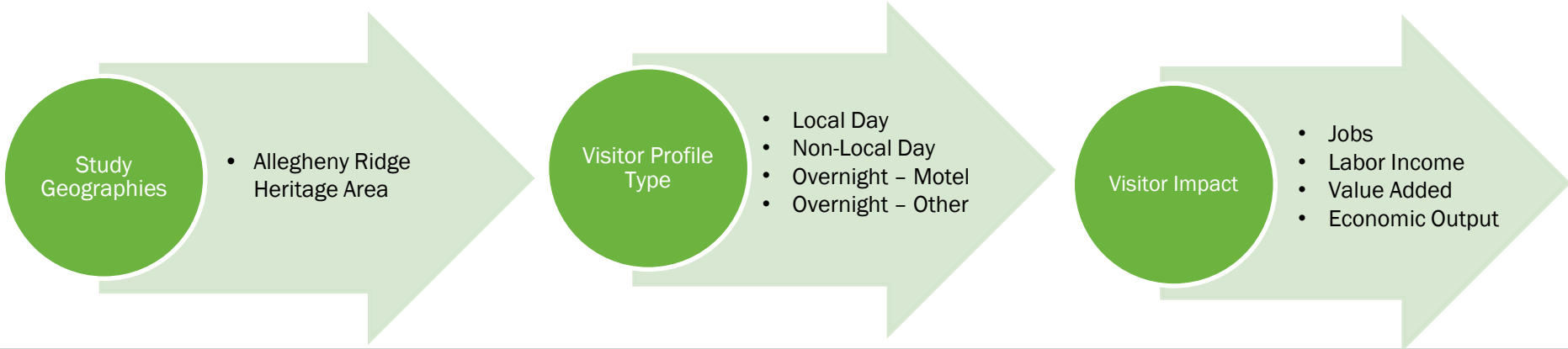
Since visitor spending by local residents as a result of new investment would likely stay within the region or shift to another category, an “economic impact analysis” should focus on non-local visitor spending from those residing outside the local region as their spending constitutes "new dollars" to the region. In 2014, non-local day visitors (those living more than 60 miles away) to Allegheny Ridge spent an average of $122 per day per travel party, while overnight visitors spent between $163 and $283 per travel party, depending on accommodation type.

$52.3 million in total economic output from out-of-town visitors in 2014

In 2014, Allegheny Ridge out-of-town visitors spent an estimated 344,903 travel party days/nights in the Heritage Area and $65.6 million in 2014. This visitor spending resulted in $52.3 million in total economic output, and supported 699 total jobs and $20.9 million in total labor income when including indirect and induced effects. For every four jobs directly supported by heritage visitor spending another indirect job is supported annually (multiplier of 1.24).

Methodology: Tourism and Visitor Spending

The Little Conemaugh watershed is located within the Allegheny Ridge Heritage Area and the Main Line Canal Greenway, a 320-mile corridor running from Harrisburg to Pittsburg and including portions of Cambria County. In order to better understand the potential economic impact from visitor spending within the watershed, 4ward Planning identified visitor profile data within the Allegheny Ridge Heritage Area (HA) according to a 2014 report provided by the Center for Rural Pennsylvania. Allegheny Ridge visitor profile and spending impacts are provided for both local day visitors (those living less than 60 miles away) and non-local day visitors, as well as overnight visitors by accommodation type (e.g. campground, private residence, or with friends and family).

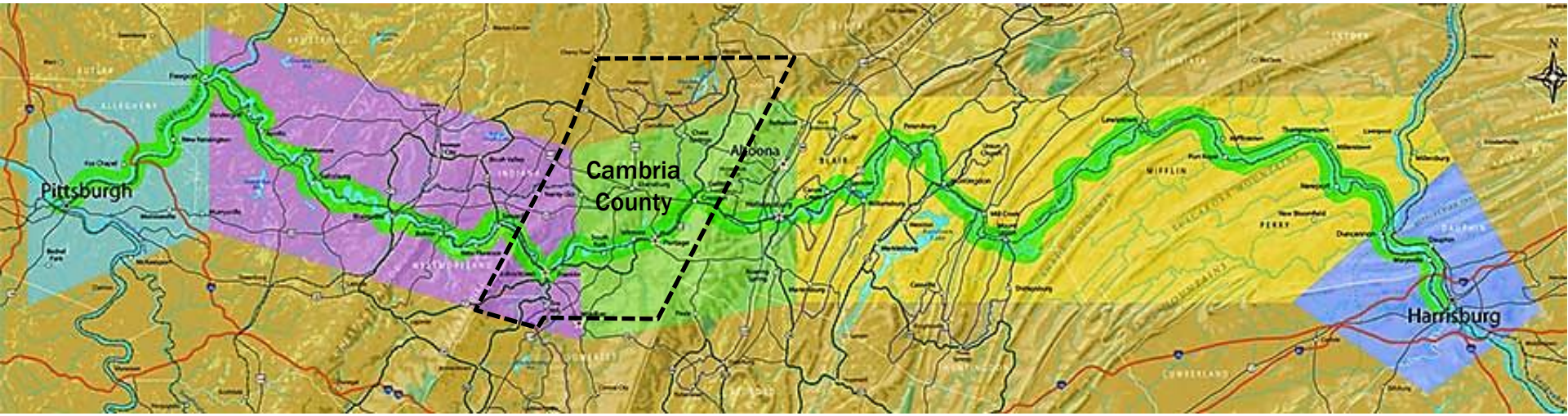


Allegheny Ridge Heritage Area

Pennsylvania Heritage Areas Program is a multi-region asset-based economic development program aimed at strengthen regional economies and Pennsylvania's tourism industry. The Little Conemaugh watershed is located within the Allegheny Ridge Heritage Area and the Main Line Canal Greenway, a corridor running from Harrisburg to Pittsburgh. The Jim Mayer Riverwalk and Path of the Flood trails located within the watershed are designated to serve as a piece of the Sept. 11 National Memorial Trail and the Pennsylvania's Main Line Canal Greenway.

Pennsylvania Heritage Areas

Allegheny Ridge Heritage Area and the Main Line Canal Greenway



Source: PA Department of Conservation and Natural Resources, 4ward Planning Inc., 2018

Allegheny Ridge:
Top Attractions

According to 2014 visitor surveys conducted by the Center for Rural Pennsylvania, three of the top 30 attractions within the Allegheny Ridge are located within the Little Conemaugh watershed, including the Staple Bend Tunnel, the Johnstown Flood Memorial, the Ghost Town Trail, and the Potatofest festival (highlighted in green in the table to the right). Of the 524 visitors surveyed, approximately four percent visited the Staple Bend Tunnel and three percent visited the Johnstown Flood Memorial. Other top attractions (highlighted in yellow in the table to the right) are located just outside the watershed, with many of these within the Town of Johnstown.

Source: Center for Rural Pennsylvania, Economic Impact of Pennsylvania Heritage Areas, 2014; Esri, 4ward Planning, 2018.

Allegheny Ridge Top 30 Attractions Cited by Respondents

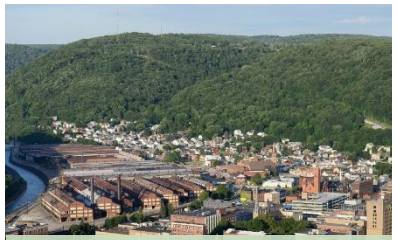
	Attraction	Frequency	Percent	Type	City
1	Horseshoe Curve	121	12.0%	Historic Landmark	Altoona
2	Johnstown Inclined Plane	88	8.7%	Funicular	Johnstown
3	Altoona Railroaders Museum	87	8.6%	Museum	Altoona
4	Xtreme Folk Festival	62	6.1%	Festival	Telford
5	Johnstown Flood Museum	58	5.7%	Museum	Johnstown
6	Staple Bend Tunnel	44	4.3%	Park	Johnstown
7	Prince Gallitzin Apple Cider Fest	42	4.2%	Festival	Patton
8	Johnstown	36	3.6%	Town	Johnstown
9	Allegheny Portage Railroad	33	3.3%	Historic Landmark	Cresson
10	Flood City Music Festival	30	3.0%	Festival	Johnstown
11	Hartslog Day	30	3.0%	Festival	Alexandria
12	Johnstown Flood Memorial	27	2.7%	Historic Landmark	South Fork
13	6 to 10 Trail	25	2.5%	Trail	Duncansville
14	Flight 93 Memorial	18	1.8%	Historic Landmark	Stoystown
15	Johnstown Heritage Discovery Center	18	1.8%	Cultural Center	Johnstown
16	Altoona	16	1.6%	Town	Altoona
17	Gallitzin Tunnels Museum	12	1.2%	Museum	Gallitzin
18	Canoe Creek State Park	9	0.9%	Park	Hollidaysburg
19	Ghost Town Trail	9	0.9%	Trail	Ebensburg
20	Lemmon House	9	0.9%	Historic Landmark	Gallitzin
21	War Memorial Arena	9	0.9%	Sports Arena	Johnstown
22	Altoona Curve Baseball	8	0.8%	Sports Arena	Altoona
23	Potatofest	8	0.8%	Festival	Ebensburg
24	Prince Gallitzin State Park	8	0.8%	Park	Patton
25	DelGrosso's Amusement Park	7	0.7%	Amuesement Park	Tipton
26	Pittsburgh	7	0.7%	Town	Pittsburgh
27	Penn State	6	0.6%	University	State College
28	Boyer's Candy Factory	5	0.5%	Store	Altoona
29	Stonycreek River	5	0.5%	River	Johnstown
30	Asiago's Restaurant	4	0.4%	Restaurant	Johnstown

Allegheny Ridge: Top Attractions in or near the Watershed


Johnstown Inclined Plane


Johnstown Flood Museum


Staple Bend Tunnel


Johnstown Town


Flood City Music Festival

Johnstown Flood Memorial

Johnstown Heritage Discovery Center


Ghost Town Trail


War Memorial Arena


Potatofest

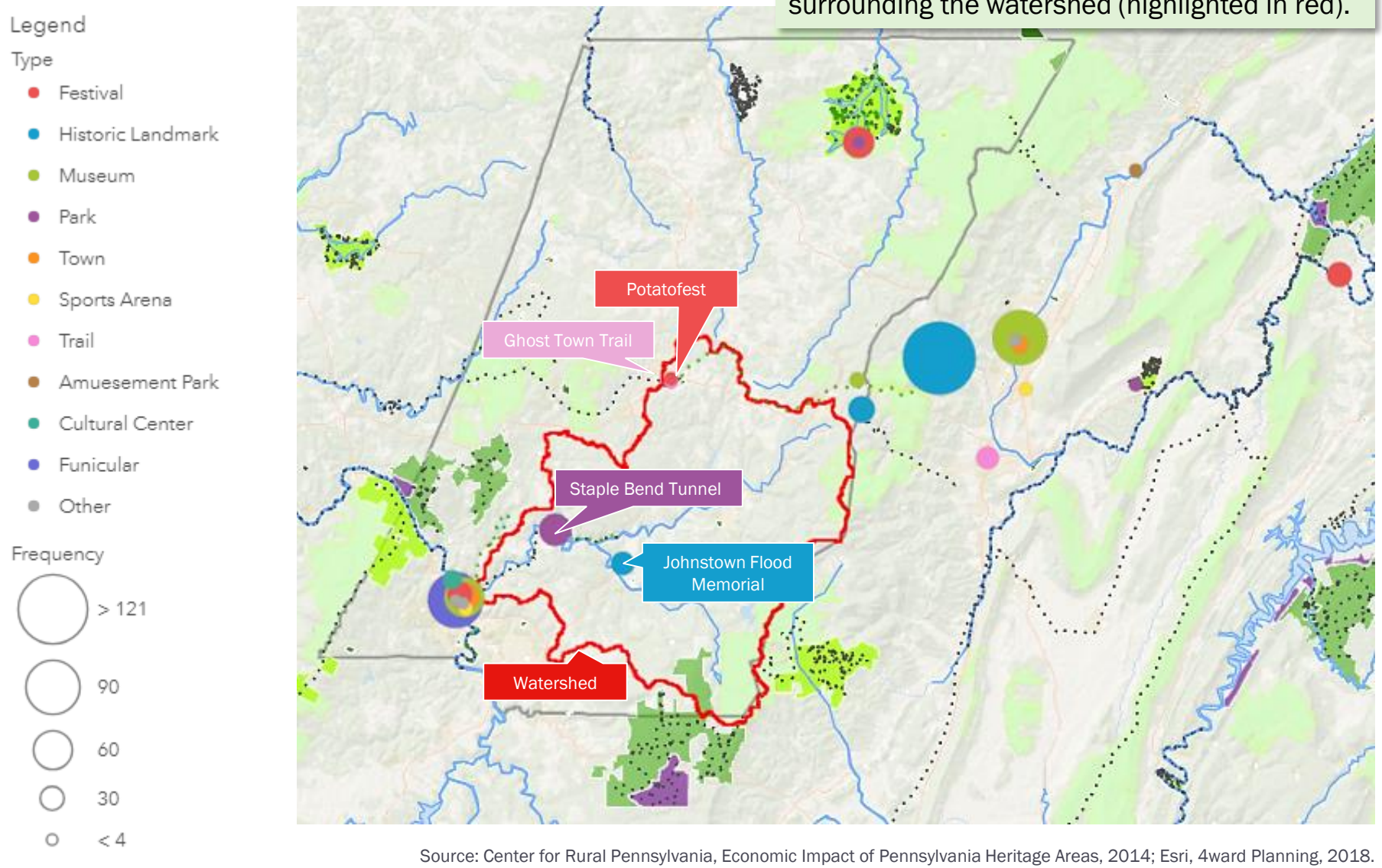

Stonycreek River


Asiago's Restaurant

Source: Center for Rural Pennsylvania, Economic Impact of Pennsylvania Heritage Areas, 2014; Esri, Online, 4ward Planning, 2018.

Allegheny Ridge: Top 30 Attractions

The map below illustrates the top Allegheny Ridge attractions located within and surrounding the watershed (highlighted in red).



Source: Center for Rural Pennsylvania, Economic Impact of Pennsylvania Heritage Areas, 2014; Esri, 4ward Planning, 2018.

Allegheny Ridge: Visitor Estimates

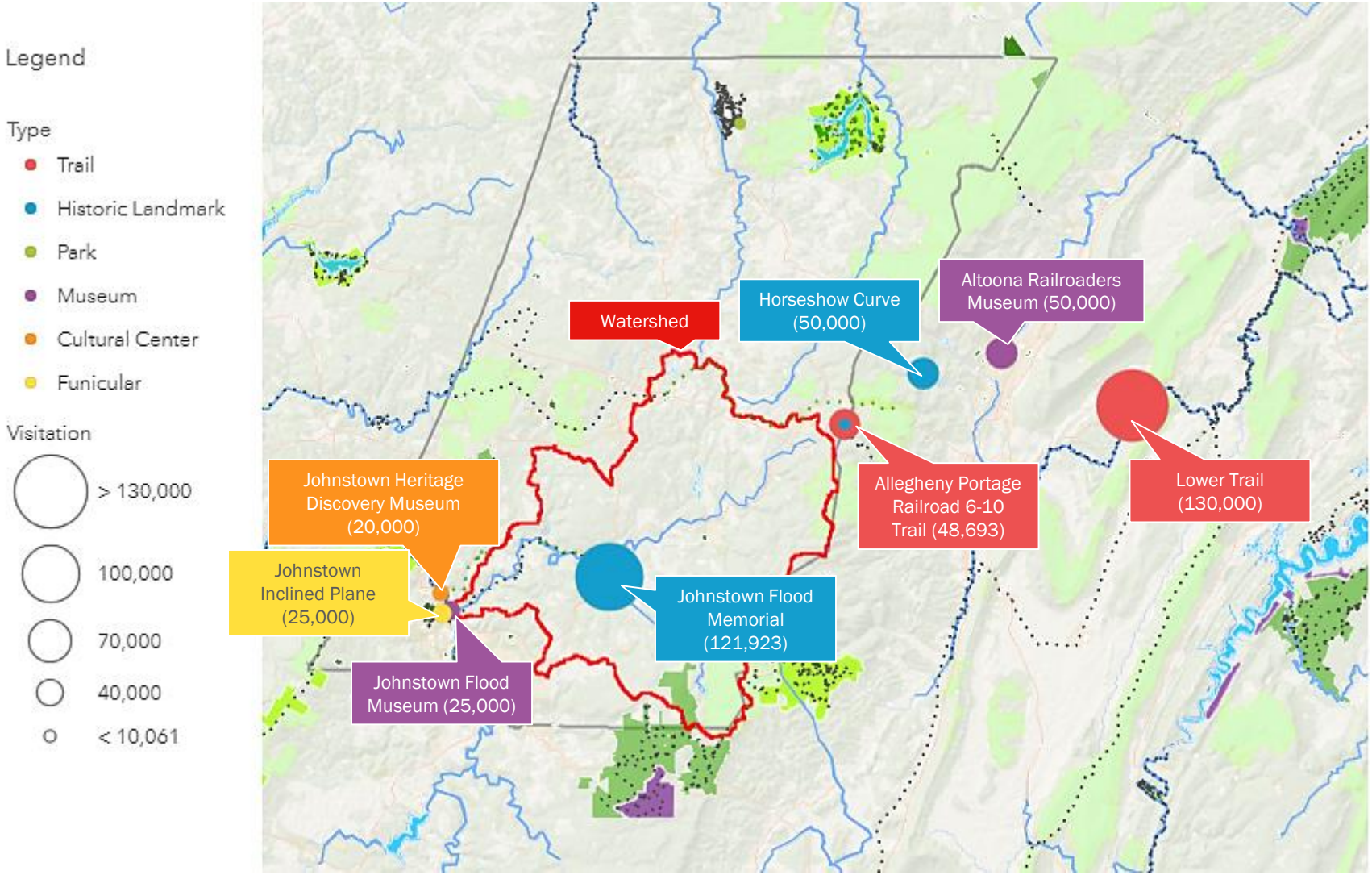
According to 2014 estimates provided by Allegheny Ridge Heritage staff (illustrated in the table below and mapped on the following page), two of Allegheny Ridge's top attractions with visitor estimates are located within the Little Conemaugh watershed, including the Johnstown Flood Memorial (121,923 visitors per year) and the Johnstown Flood Museum (25,000 visitors per year). Located just outside the watershed, the Johnstown Inclined Plane and the Johnstown Heritage Discovery Center both attract approximately 25,000 visitors per year. It is likely that some portion of these visitors would also respond favorably to increased recreational activities within the Little Conemaugh watershed area – and also stimulate new economic investments.

Allegheny Ridge Top Attractions with Visitation Estimated by HA Staff

	Attraction	Visitation	Visitors per Trail Mile	Type	City
1	Lower Trail (16.5 miles)	130,000	7,880	Trail	Hollidaysburg
2	Johnstown Flood Memorial	121,923		Historic Landmark	South Fork
3	Roaring Run Recreation Area	75,000		Park	Apollo
4	West Penn Trail (17 miles)	60,000	3,530	Trail	Blairsville
5	Altoona Railroaders Museum	50,000		Museum	Altoona
6	Horseshoe Curve	50,000		Historic Landmark	Altoona
7	Allegheny Portage Railroad 6-10 Trail (13.7 miles)	48,693	3,550	Trail	Cresson
8	Juniata River Trail (10.4 miles)	30,000	2,880	Trail	Newport
9	Johnstown Flood Museum	25,000		Museum	Johnstown
10	Johnstown Inclined Plane	25,000		Funicular	Johnstown
11	Johnstown Heritage Discovery Center	20,000		Cultural Center	Johnstown
12	Holidaysburg Canal Basin Park	20,000		Park	Hollidaysburg
13	Rock Run Recreation Area	10,500		Park	Patton
14	Allegheny Portage Railroad	10,061		Historic Landmark	Cresson

Note: Survey of visitors to 5 study heritage areas, 2014; 3,524 total respondents
Source: Center for Rural Pennsylvania, Economic Impact of Pennsylvania Heritage Areas, 2014; Esri, 4ward Planning, 2018.

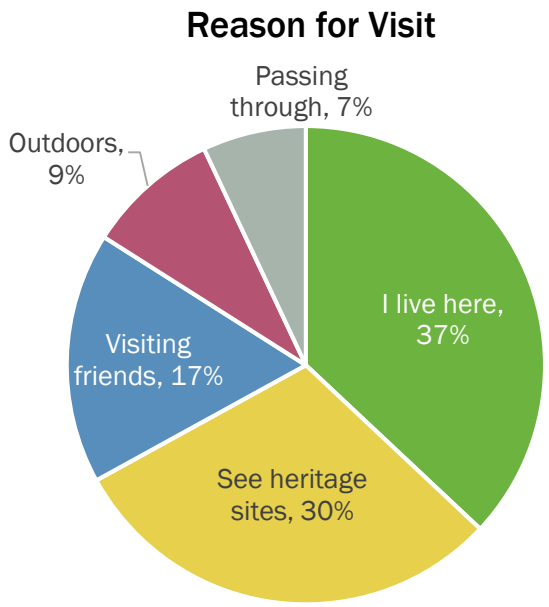
Allegheny Ridge: Visitor Estimates



Source: Center for Rural Pennsylvania, Economic Impact of Pennsylvania Heritage Areas, 2014; Esri, 4ward Planning, 2018.

Allegheny Ridge: Visitor Profile

In order to estimate the economic impact from heritage-related visitation within each Heritage Areas, in 2014, the Center for Rural Pennsylvania administered visitor surveys in order to help identify heritage visitor profiles and spending. The table to the right summarizes visitor profile characteristics. For example, approximately 30 percent are day visitors and 70 are overnight visitors. Eighty-one percent are from Pennsylvania while 19 percent are from out of state.



Visitor Type

	Percent
Local Day Visitor (less than 60 miles)	24%
Non Local Day Visitor (60 miles or more)	6%
Overnight visitor, Motel	21%
Overnight visitor, Other	49%
Total	100%

Pennsylvania or Out-of State Visitors

	Percent
Pennsylvania residents	81%
Out of state visitors	19%
Total	100%

Travel Party Size

	Mean
How many adults are in your travel party?	2.24
How many youths are in your travel party (under 18)?	2.34

Note: Survey of visitors to Allegheny Ridge HA, 2014; 524 total respondents
Source: Center for Rural Pennsylvania, Economic Impact of Pennsylvania Heritage Areas, 2014.

Allegheny Ridge: Visitor Spending

Since visitor spending by local residents as a result of new investment would likely stay within the region or shift to another category, an "economic impact analysis" should focus on non-local visitor spending from those residing outside the local region as their spending constitutes "new dollars" to the region. As presented in the table on the right, top, in 2014, non-local day visitors to Allegheny Ridge (those living more than 60 miles away) spent an average of $122 per day per travel party (an average of 3.13 persons per travel party), while overnight visitors spent between $163 and $283 per travel party (average 3.13 persons), depending on accommodation type (higher among those staying at a motels and less for those staying at a campground, private residence, or with friends and family).

As presented in the table on the right, below, Allegheny Ridge out-of-town visitors spent an estimated 344,903 travel party days/nights in the Heritage Area and $65.6 million in 2014. This visitor spending resulted in $52.3 million in total economic output, and supported 699 total jobs and $20.9 million in total labor income when including indirect and induced effects. For every four jobs directly supported by heritage visitor spending another indirect job is supported annually (multiplier of 1.24).

*Visitors that spend the night at a campground, private residence, or with friends and family
** Party days/nights accounts for all visitors within a group and the time they spend in an area
*** Non-local is defined as those living beyond 60 miles
Source: Center for Rural Pennsylvania, Economic Impact of Pennsylvania Heritage Areas, 2014.

2014 Survey Results: Allegheny Ridge

	Number
Completed Questionnaires	524
Visit to HA was Primary Purpose of Trip	64%
Average Number of Visitors Per Party	3.13
Visitor Segment by Annual Party Days/Nights	
Local Day	33,182
Non-Local Day	8,296
Overnight – Motel	81,877
Overnight – Other*	254,730
Total # of Party Days/Nights	378,085
Average Daily Per Party Spending	
Local Day	$108
Non-Local Day	$122
Overnight – Motel	$283
Overnight – Other*	$163

2014 Spending Impact

Impact	All Visitors	Non-Local *** or Overnight
Visitors (# of Party days/nights)**	378,085	344,903
Heritage Visitor Spending (000's)	$69,203	$65,606
Direct Effect		
Jobs	599	564
Labor Income (000's)	$15,013	$14,164
Value Added (GDP) (000's)	$20,671	$19,534
Output (000's)	$35,332	$33,386
Total Effect		
Jobs	741	699
Labor Income (000's)	$22,155	$20,914
Value Added (GDP) (000's)	$32,952	$31,137
Output (000's)	$55,352	$52,300
Multiplier		
Jobs	1.24	1.24
Labor Income (000's)	1.48	1.48
Value Added (GDP) (000's)	1.59	1.59
Output (000's)	1.57	1.57

Little Conemaugh Watershed

Key Findings: Watershed Tourism and Visitor Spending

The watershed currently attracts a minimum of 121,920 visitors per year

With the Johnstown Flood Memorial alone attracting approximately 121,920 visitors, it is assumed that the Little Conemaugh watershed is attracting a minimum of 121,900 visitors per year. With an average of 3.13 visitors per travel party, this is 38,950 heritage visitor parties per year. Assuming the same share of visitors by type (local, non-local day, overnight) and the average daily spending per travel party (adjusted for inflation), in 2018, heritage visitors in the watershed are estimated to spend nearly $7.3 million per year.

$4.6 million in total economic output from out-of-town visitors in 2018

In 2018, the estimated 92,660 out-of-town visitors spent approximately 29,600 travel party days/nights and nearly $6.2 million in the watershed. This visitor spending results in nearly $4.6 million in total economic output, and supports 69 total jobs and $1.4 million in total labor income when including indirect and induced effects. Similar to the Allegheny Ridge HA, for every four jobs directly supported by visitor spending another indirect job is supported annually (multiplier of 1.21).

$6.2 million in total economic output from out-of-town visitors by 2040

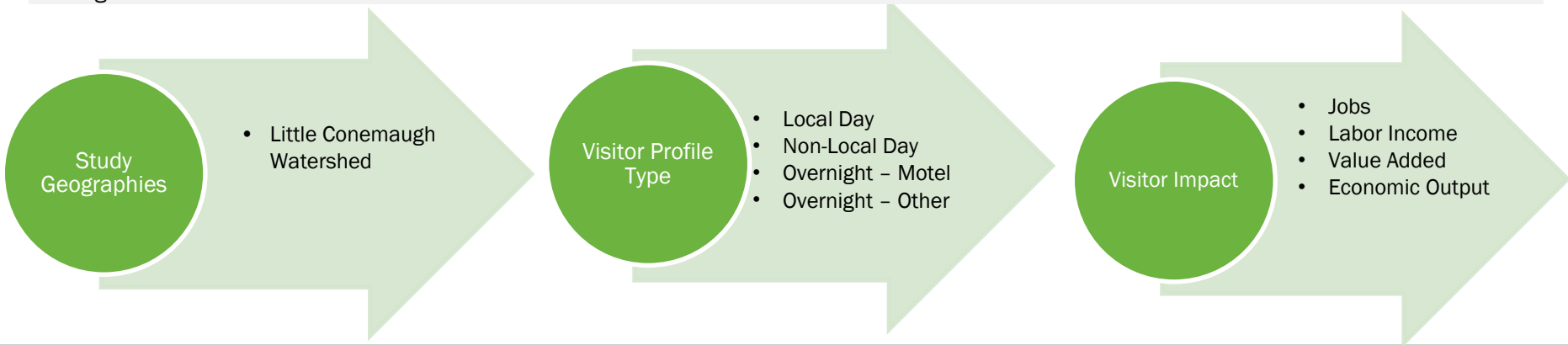
Assuming a one percent annual growth in visitors starting in 2026 (after restoration efforts are completed), out-of-town visitors to the watershed would spend approximately 34,030 travel party days/nights and nearly $11.5 million in the watershed by 2040. Assuming similar spending allocations by category as found within the 2014 Allegheny Ridge survey, this visitor spending would resulted in $7.0 million in total economic output, and supported 96 total jobs and nearly $2.1 million in total labor income when including indirect and induced effects. Furthermore, this spending would result in an estimated $979,850 in annual local, state, and federal taxes.

Methodology: Tourism and Visitor Spending

As presented in more detail in the Appendix, 4ward Planning utilized IMPLAN Professional 3.0, a widely used economic impact assessment software system to evaluate the prospective economic impacts from potential increases in visitor spending due to watershed restoration. 4ward Planning purchased the most recent IMPLAN data files (2016) for Cambria County, New York. For modeling purposes, 4ward Planning utilized IMPLAN's regional purchase coefficients (local purchase percentage) for the county. A conservative increase of one percent per year in the number of visitors is assumed starting in 2026 (after restoration is complete). The analysis assumes similar spending allocations by category as found within the 2014 Allegheny Ridge survey (table below). An annual inflation rate of 2.2 percent per year is assumed for average daily per travel party spending. All dollar figures are presented in current 2018 dollars.

Percent of Average Spending by Categories and Visitor Type – Allegheny Ridge Heritage Area

	Restaurant & Bars	Amusements	Retail Purchases	Gas & Oil	Motel, Hotel, B&B	Groceries	Camping Fees	Local Transport
IMPLAN Sector	*502*	*496*	*404*	*402*	*499*	*400*	*500*	*414*
Local Day	32%	29%	19%	13%	0%	6%	0%	0%
Non-Local Day	30%	30%	20%	13%	0%	5%	0%	1%
Overnight - Motel	22%	16%	16%	8%	34%	3%	0%	1%
Overnight - Other	30%	22%	20%	12%	0%	8%	5%	2%



Little Conemaugh Watershed: Visitor Spending Assumptions

	2018	2026	2040	2026-2040 Change
Visitor Segement by Type				
Local Day (24%)	29,261	29,261	33,635	3,061
Non-Local Day (6%)	7,315	7,315	8,409	765
Overnight - Motel (21%)	25,603	25,603	29,430	2,679
Overnight - Other (49%)	59,741	59,741	68,671	6,250
Total Visitors	121,920	121,920	140,144	12,756
Annualized Growth Rate	0.0%	0.0%	1.0%	NA
Visitor Segment by Party Days/Nights				
Local Day	9,348	9,348	10,746	978
Non-Local Day	2,337	2,337	2,686	245
Overnight - Motel	8,180	8,180	9,403	856
Overnight - Other	19,087	19,087	21,939	1,997
Total Party Days/Nights	38,952	38,952	44,774	4,075
Adj. Average Daily Per Party Spending				
Local Day	$118	$141	$191	$34
Non-Local Day	$133	$158	$215	$38
Overnight - Motel	$309	$368	$499	$89
Overnight - Other	$177	$211	$286	$51
Annual Inflation Assumption	2.2%	2.2%	2.2%	-
Total Daily Per Party Spending				
Local Day	$1,105,642.66	$1,315,897	$2,051,321	$491,047
Non-Local Day	$310,704	$369,789	$576,455	$137,992
Overnight - Motel	$2,527,241	$3,007,834	$4,688,843	$1,122,418
Overnight - Other	$3,384,677	$4,028,324	$6,279,661	$1,503,229
Total	$7,328,265	$8,721,845	$13,596,281	$3,254,686

Source: IMPLAN, 4ward Planning, Inc., 2018

Little Conemaugh Watershed: Visitor Spending & Impacts (2018)

With the Johnstown Flood Memorial alone attracting approximately 121,920 visitors per year, it is assumed that the Little Conemaugh watershed is attracting a minimum of 121,900 visitors per year or 38,950 travel party days/night per year (an average of 3.13 visitors per travel party day/night). Assuming the same share of visitors by type (local, non-local day, motel overnight, and other overnight) and the average daily spending per travel party (adjusted for inflation), in 2018, heritage visitors in the watershed are estimated to spend $7.3 million per year.

In 2018, out-of-town visitors spent approximately 29,600 travel party days/nights and nearly $6.2 million in the watershed. This visitor spending results in $4.5 million in total economic output, and supports 84 total jobs and $1.9 million in total labor income when including indirect and induced effects. Like the Allegheny Ridge HA, for every four jobs directly supported by visitor spending another indirect job is supported annually (multiplier of 1.21). Furthermore, this spending results in an estimated $854,640 in annual local, state, and federal taxes.

Impact	All Visitors	Non-Local or Overnight
Visitors	121,920	92,659
Party days/nights (3.13 per party)	38,952	29,604
Heritage Visitor Spending	$7,328,265	$6,222,623
Direct Effect		
Jobs	80	69
Labor Income	$1,574,894	$1,391,949
Value Added (GDP)	$2,448,485	$2,133,668
Output (000's)	$3,358,486	$2,738,583
Total Effect		
Jobs	97	84
Labor Income	$2,214,106	$1,938,205
Value Added (GDP)	$3,578,958	$3,098,296
Output	$5,505,962	$4,568,029
Multiplier		
Jobs	1.21	1.21
Labor Income	1.41	1.39
Value Added (GDP)	1.46	1.45
Output	1.64	1.67
Taxes		
State and Local	$457,168	$394,834
Federal	$528,545	$459,802
Total Taxes	$985,713	$854,636

Source: IMPLAN, 4ward Planning, Inc., 2018

Little Conemaugh Watershed: Visitor Spending & Impacts (2026)

Assuming zero percent annual growth in the number visitors through 2026, the watershed would continue to attract approximately 121,920 visitors in 2026. With an average of 3.13 visitors per travel party, this is 38,950 days/night per year. Assuming the same share of visitors by type and the average daily spending per travel party (assuming a 2.2 percent annual increase due to inflation), by 2026, heritage visitors in the watershed are estimated to spend $8.7 million per year.

As presented in the table on the right, in 2018, out-of-town visitors spent approximately 29,600 travel party days/nights and nearly $7.4 million in the watershed. Assuming similar spending allocations by category as found within the 2014 Allegheny Ridge survey, this visitor spending would resulted in $5.3 million in total economic output, and supported 78 total jobs and nearly $1.6 million in total labor income when including indirect and induced effects. Furthermore, this spending would result in an estimated $759,500 in annual local, state, and federal taxes.

Impact	All Visitors	Non-Local or Overnight
Visitors	121,920	92,659
Party days/nights	38,952	29,604
Heritage Visitor Spending	$8,721,845	$7,405,947
Direct Effect		
Jobs	75	63
Labor Income	$1,233,911	$1,026,264
Value Added (GDP)	$2,109,552	$1,753,123
Output (000's)	$4,207,641	$3,503,702
Total Effect		
Jobs	93	78
Labor Income	$1,884,365	$1,571,120
Value Added (GDP)	$3,258,464	$2,713,678
Output	$6,408,460	$5,343,380
Multiplier		
Jobs	1.23	1.23
Labor Income	1.53	1.53
Value Added (GDP)	1.54	1.55
Output	1.52	1.53
Taxes		
State and Local	$438,392	$367,799
Federal	$469,669	$391,702
Total Taxes	$908,061	$759,501

Source: IMPLAN, 4ward Planning, Inc., 2018

Little Conemaugh Watershed: Visitor Spending & Impacts (2040)

Assuming one percent annual growth in area visitors, starting in 2026 (after restoration efforts are completed), the watershed could attract approximately 140,140 visitors by 2040. With an average of 3.13 visitors per travel party, this is 44,770 heritage visitor parties per year. Assuming the same share of visitors by type and the average daily spending per travel party (assuming a 2.2 percent annual increase due to inflation), by 2040, heritage visitors in the watershed are estimated to spend $13.6 million per year.

As presented in the table on the right, by 2040, out-of-town visitors to the watershed are estimated to spend approximately 34,030 travel party days/nights and nearly $11.5 million in the watershed. Assuming similar spending allocations by category as found within the 2014 Allegheny Ridge survey, this visitor spending would resulted in $7.0 million in total economic output, and supported 96 total jobs and nearly $2.1 million in total labor income when including indirect and induced effects. By 2040, this spending would result in an estimated $979,850 in annual local, state, and federal taxes (equivalent to a 15 percent increase from 2018 tax estimates).

Source: IMPLAN, 4ward Planning, Inc., 2018

Impact	All Visitors	Non-Local or Overnight
Visitors	140,144	106,509
Party days/nights	44,774	34,029
Heritage Visitor Spending	$13,596,281	$11,544,959
Direct Effect		
Jobs	84	77
Labor Income	$1,508,269	$1,368,803
Value Added (GDP)	$2,522,555	$2,341,566
Output (000's)	$5,058,653	$4,616,914
Total Effect		
Jobs	105	96
Labor Income	$2,308,317	$2,068,533
Value Added (GDP)	$3,927,005	$3,582,337
Output	$7,743,600	$6,991,110
Multiplier		
Jobs	1.25	1.24
Labor Income	1.53	1.51
Value Added (GDP)	1.56	1.53
Output	1.53	1.51
Taxes		
State and Local	$490,522	$460,564
Federal	$566,598	$519,284
Total Taxes	**$1,057,120**	**$979,848**

Appendix

Interview Contacts

Doug Beri
Vice President
Conemaugh Valley Conservancy
(720) 788-6271

Brad Clemenson
PA Economic Council
Pennsylvania Environmental Council
Grant Writer for Bens Creek Canoe Club
(814) 659-3465

Michael Cook
Bens Creek Canoe Club
Inclined Plane Trails Project
Michael.a.cook23@gmail.com

John Dawes
Executive Director
Foundation for PA Watersheds
(814) 669-4244

Branden S. Diehl
Grant and Project Consultant
Foundation for PA Watersheds
(814) 669-4244

John Dryzal
District Manager
Cambria County Conservation District
(814) 472-2120

Chad Gontkovic
Owner, Coal Tubin
(814) 234-3286

Susan Huba
Executive Director
Loyalhanna Watershed Association
(724) 238-7560

Katie Kinka
Senior Planner
Cambria County Planning Commission
(814) 472-2106

Len Lichvar
Chairman
Stonycreek-Conemaugh River Improvement Project
(814) 445-4652

Dave Lietford
Bureau of Abandoned Mine Reclamation
(814) 472-1800

Ligonier Outfitters
Dan & Logan McMaster and Jim Hall
(724) 238-4900

Melissa Radovanic
Director of Sales & Marketing
Crown American Hotels (Holiday Inn)
(814) 248-3036

Lisa Rager
Executive Director
Greater Johnstown-Cambria County Visitors Bureau
(814) 536-7993

Melissa Reckner
Brandywine Conservancy
(former Kiski-Conemaugh Stream Team Director)
(814) 444.2669

Jackie Ritko
Little Conemaugh Watershed Association
(814) 472-2120

Ron Robertson
Director of Community Development
Cambria County
(814) 472-1606

Debra Orner
Johnstown Chamber of Commerce
debra@johnstownchamber.com

Mike Timcik
Engineer, Bureau of Abandoned Mine Reclamation
PA Department of Environmental Protection
(814) 472-1800

Patrick Webb
Mining Engineer Manager
Bureau of Abandoned Mine Reclamation
PA Department of Environmental Protection
(814) 472-1800

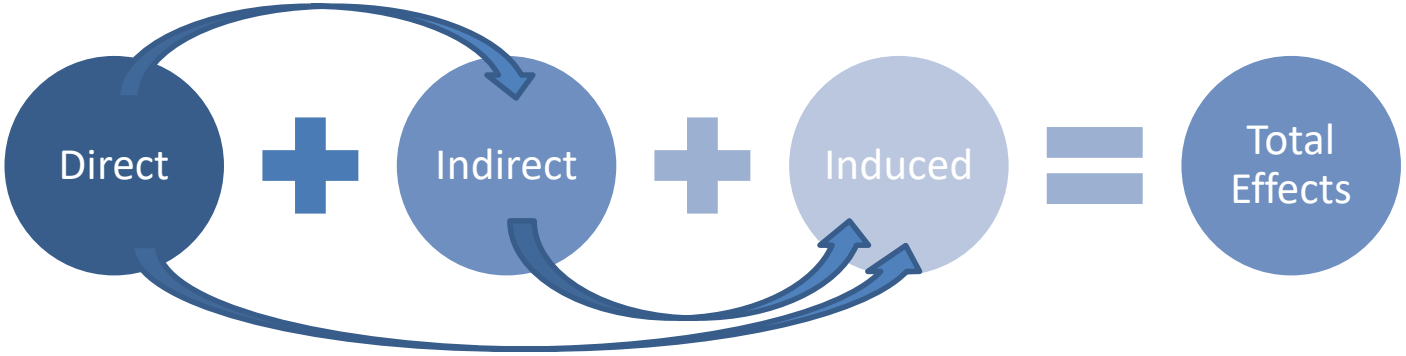
IMPLAN Modeling

Methodology: General Input-Output Impact Modeling

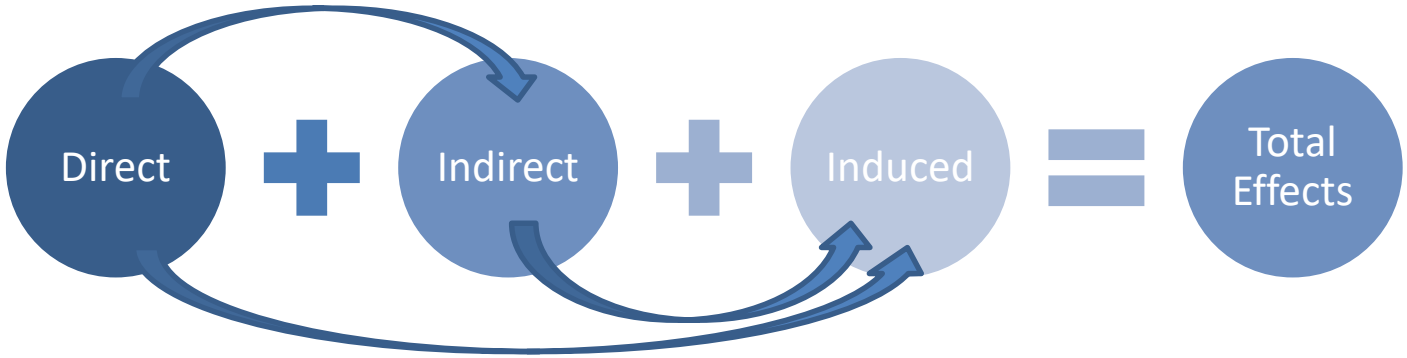
Economic impact analysis involves applying a final demand change to a predictive economic input-output model, and then analyzing the resulting changes in the economy under study.

More concisely, an impact analysis is an assessment of change in overall economic activity as a result of change in one or several specific economic activities.

Economic impacts, whether for employment or output, are typically referenced as ***direct***, ***indirect***, and ***induced***. 4ward Planning has expressed the estimated direct, indirect, and induced impacts in this analysis.



Methodology: General Input-Output Impact Modeling - Example



Direct impacts are the result of a change in final demand.

For example, if $10 million is spent annually by recreation users on gear, accessories, vehicles, and other trip related sales…

Indirect effects result from changes in demand for factors of production.

…the $10 million increase in the recreation spending causes a $4 million increase in purchase orders to related industries.

Induced effects result from changes in household spending.

Recreation related industries pay their workers wages to deliver related products, enabling workers to spend an additional $100,000 within the regional economy.

Total effects are the combination of direct, indirect, and induced effects.

The total effect of a $10 million increase in recreation-related spending, then, is equal to $14.1 million ($10 million + $4 million + $100,000).

Super 7 Discharge Report

Little Conemaugh River Watershed Facts

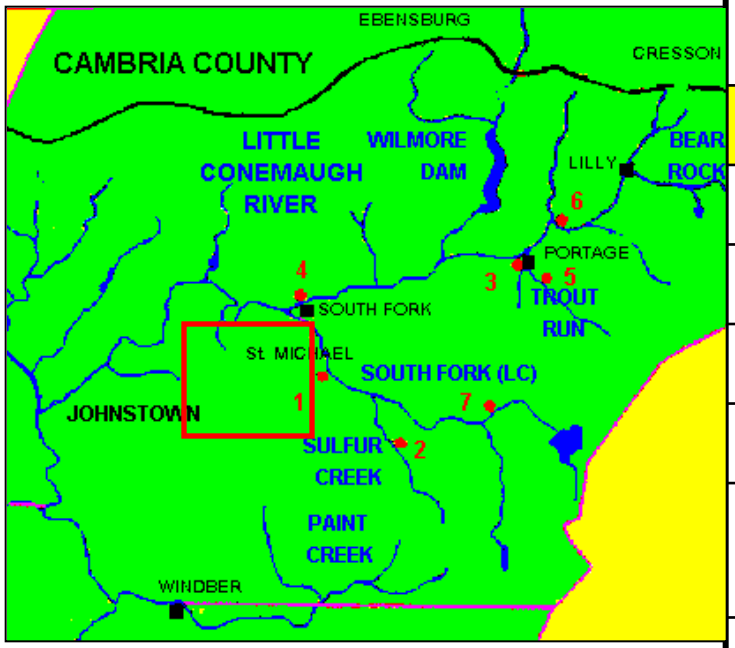
- The watershed covers approximately 190 sq/mi and covers 32 municipalities including Ebensburg, the county seat, the city of Johnstown, and parts of Bedford, Blair, and Somerset Counties,
- The main stem of the Little Conemaugh River is 29.1 miles long and has an average slope of 53 feet per mile, and
- The headwaters begin in the Cresson area and continue on until reaching the Point Stadium area in Johnstown.

Confluence of Stoneycreek and the Little Conemaugh River at the Point in Johnstown, PA.

Super 7 Strategy

- On February 15, 2008, the WPCAMR Board of Directors recognized and endorsed the “Super 7 Strategy” as initiated by the Cambria County Conservation District Board of Directors, and
- The goal of the project is to develop a remediation strategy addressing the seven largest abandoned mine discharges in the Little Conemaugh River Watershed.

Little Conemaugh River – Ranking of Discharges by Load



Rank	Site	Load(#/day)	% of Total
1	St. Michael	31,141	29.2%
2	Sulfur Creek	11,418	10.71%
3	Trout Run	14,301	13.41%
4	Ehrenfeld	12,742	11.94%
5	Sonman	10,370	9.72%
6	Hughes Borehole	8,318	7.79%
7	Beaverdale	6,755	6.33%

St. Michael Water Treatment Plant Site located in St. Michael, PA formerly the Berwind White Coal Company St. Michael Shaft.

The property has been acquired by Conemaugh River Restoration Company (CRRC).

The adjoining properties were previously owned by Inter-Power/Ahlon Partners, and are currently under agreement to (CRRC).

Inter-Power excavated the eastern slope for co-generation fuel and ‘reclaimed’ it.

The western slope refuse material was not economically feasible to excavate and utilize for Inter-Power Co-Generation fuel.

Remnants of the Berwind White Coal Company on the St. Michael Water Treatment Plant site.

Maryland No. 1 Mine St. Michael Shaft. Berwind ceased operations in 1962.

36” Diameter pipe near the top of the abandoned Maryland No. 1 Mine shaft collar discharging Acid Mine Drainage (AMD) since December 1963.

Average flow rate 2,067 gallons per minute to 3,656 gallons per minute of (AMD). In order to overcome discharge rate draw down pump capacity at the St. Michael Water Treatment Plant will be 10,000 gallons/minute.

St. Michaels Water Quality

2001-2004	
Parameter	**Average**
Ph	5.73
Acidity	352
Alkalinity	37
Iron	129
Manganese	4.25
Aluminum	0.46

BAT Water Quality

PA Title 25 Chapter 93.7	
Parameter	**Average**
Ph	6.0-9.0
Acidity	< Alkalinity
Alkalinity	20
Iron	1.5
Manganese	1.0
Aluminum	0.75

St. Michael discharges flows directly into Topper Run. Ranked #1 highest AMD discharge load 31,141 #/day by WPCAMR.

Residual discharges in addition to the main flow at areas along the stream banks of Topper Run.

The iron oxidizes once exposed to oxygen. A chemical reaction occurs turning ferrous iron to ferric iron allowing the iron to settle out. This process is expedited with the enhancement of a water treatment system utilizing hydrated lime.

Additional residual discharges.

An abandoned well discharging AMD caused by the St. Michael Mine Pool near the shaft. Upon lowering St. Michael Mine Pool residual discharges will cease.

Flow from abandoned well to Topper Run.

Confluence of Topper Run and South Fork of the Little Conemaugh River

Johnstown National Flood Memorial North Slope. Approximately ½ mile downstream from St. Michael discharge

Johnstown National Flood Memorial

North Abutment of the dam that breached in 1889
and tragically killed 2,200 persons in Johnstown, PA

South Fork of the Little Conemaugh River flowing directly through the Federal Park. The St. Michael (AMD) discharges contribute 3,700 tons of (AMD) per year to the Little Conemaugh River. This is the largest single source of AMD Pollution on the Little Conemaugh and equates to approximately 30% of the total AMD on the river.

The adverse effect of the AMD on the Little Conemaugh River near the Point in Johnstown, PA. Additionally, Flood Protection Improvement constructed between 1938-1943

Confluence of the Little Conemaugh and Stonycreek River forming the Conemaugh River. An opportunity exists between the Commonwealth of Pennsylvania, PA DEP, CRRC, Rosebud Mining Company, Federal Environmental Protection Agency, and the environmental community to dramatically improve the Little Conemaugh River Watershed by eliminating 30% of the total AMD load.

The long-term environmental impact of eliminating the St. Michael discharge will significantly enhance industrial/economic growth in the region.

General & Limiting Conditions

4ward Planning Inc. has endeavored to ensure that the reported data and information contained in this report are complete, accurate, and relevant. All estimates, assumptions, and extrapolations are based on methodological techniques employed by 4ward Planning Inc. and believed to be reliable. 4ward Planning Inc. assumes responsibility for inaccuracies in reporting by the client, its agents, representatives, or any other third-party data source used in the preparation of this report.

Further, 4ward Planning Inc. makes warranty or representation concerning the manifestation of the estimated or projected values or results contained in this study. This study may t be used for purposes other than that for which it is prepared or for which prior written consent has first been obtained from 4ward Planning Inc. This study is qualified in its entirety by, and should be considered in light of, the above limitations, conditions, and considerations.

For more information, please contact:

Todd Poole
646.383.3611
tpoole@landuseimpacts.com