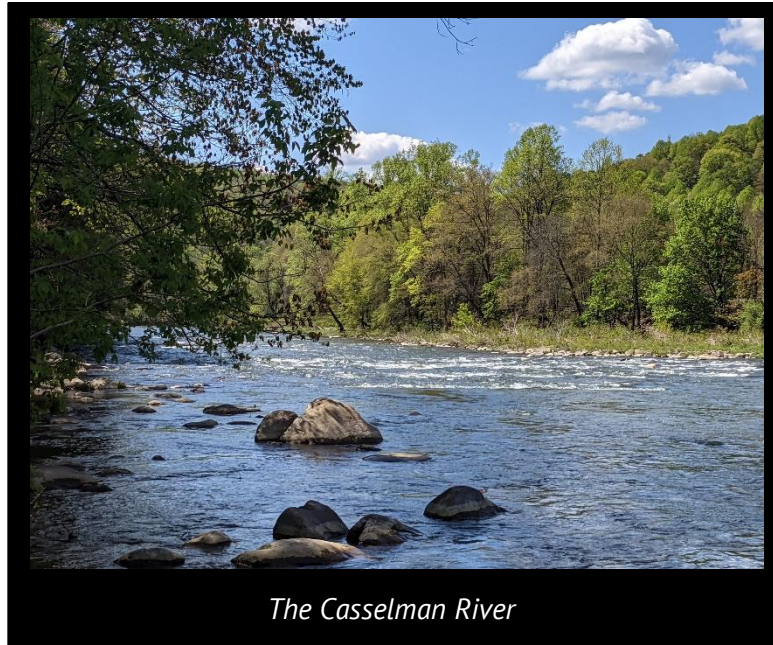


CHAPTER 4. CASSELMAN RIVER WATERSHED

Originating near Eglon, West Virginia, the Youghiogheny (Yok-i-gay-nee) River or Yough (Yok) for short, flows in a northerly direction for approximately 132 miles to where it joins the Monongahela River in McKeesport, Pennsylvania. The name is from a native American word meaning “a stream flowing in a contrary direction.”

The Casselman River is the largest tributary to the Youghiogheny River. Therefore, the Casselman River Management Unit will focus on the area of land that is encompassed by all the streams which flow into Casselman River before it joins the Youghiogheny River in Confluence, Pennsylvania, with the exception of Laurel Hill Creek. While Laurel Hill Creek is technically a tributary of the Casselman River joining just upstream of the confluence with the Youghiogheny River, Laurel Hill Creek is discussed in the next chapter (Chapter 5).



PROJECT AREA CHARACTERISTICS

Location

The majority of the Casselman River Watershed is located within Garrett County, Maryland, and Somerset County, Pennsylvania. The headwaters of some tributaries start in Preston County, West Virginia, but that amount is so minimal that this chapter’s focus will concentrate on the Maryland and Pennsylvania data, especially since it is only available by county.

The Casselman River starts south of Grantsville, Maryland, near Savage River State Forest and flows north. It enters into the Youghiogheny River below the US Army Corps of Engineers’ Lake in Pennsylvania. In Maryland, the Casselman River Watershed is roughly 20 miles in length, includes 170 stream miles, and occupies an area of approximately 42,375 acres.

Stream Classification

In order to compare waterways, geographers, geologists, and hydrologists classify each waterbody into stream orders. The higher the stream order, the larger the waterbody. Waterways with stream orders between one to three are headwater streams – meaning they are the start of a watershed. Often, these streams are intermittent; they may not flow all

the time and are typically unnamed. Moving up the scale, streams in orders three to five are slightly larger because they are a merger of order one and two streams. Lastly, larger streams such as the Youghiogheny, Monongahela, and the Ohio Rivers are considered to be between streams orders six to eight, depending on the number of smaller tributaries that have merged into them (Briney, 2019).

There are 32 named tributaries that flow directly into the Casselman River. Among these tributaries there are another 41 named tributaries, in addition to the unnamed streams, located within the Casselman River Watershed. A listing of all the named tributaries, their size and stream designation, is located in Appendix C.

Since the Casselman River Watershed is located in Maryland and Pennsylvania and the stream designations are determined by the states, the systems used for designation are different. The system used and the stream classifications are discussed below by state.

Maryland

In Maryland, most of the streams in Casselman Watershed are designated as “III”; however, some are also designated as “I” or “IV”. A designation of “III” in Maryland means that the waterways are managed as a nontidal cold-water stream. A “I” designation is managed for water contact recreation and protection of non-tidal warm water aquatic life while the “IV” designation means the waters are regulated as recreational trout waters.



Sunrise at Mt. Davis the highest point in Pennsylvania overlooking the Casselman and Youghiogheny River Watersheds (Photo courtesy of Jakeb Rising)

Pennsylvania

In Pennsylvania, the Casselman River has a diversity of stream designations. While the mainstem and majority of the tributaries are designated as warm water fisheries (WWF), the watershed does have a good number of tributaries that are designated as cold-water fisheries (CWF). One tributary, Iser's Run, has Pennsylvania's highest designation as an Exceptional Value (EV) waterway. The Whites Creek subwatershed is designated as a high-quality cold-water fishery (HQ-CWF) while Middle Creek and Parsons Run are designated as trout stocked fisheries (TSF).

Topography

The Casselman River has a mixture of topographic features. The physical change has created an elevation ranging from 3,213 feet above sea level on Mount Davis, the highest elevation in Pennsylvania. The topography ranges from relatively moderate to rugged near the Casselman River valley. The west slopes are made up of Laurel Hill, Negro Mountain, and working towards the east slopes are Allegheny Mountain and Big Savage. Generally,

these slopes are steep and forested with thin, rocky soil, while the region's valleys are distributed between forests and fields (Casselman River Conservation Plan).

Climate & Climate Change

Climate change is a "hot" topic but what actually is climate change? It is important to recognize that climate is not the same as weather. Weather is a short-term measurement of the state of the atmosphere in a single location. It involves air temperature, how much humidity is in the air, both rain and snowfall precipitation, and wind speed. Climate tracks averages and patterns of weather over long periods of time over an entire region. Basically, climate change is the study of changes in the averages and patterns of weather over time.

The Earth's climate has been changing for many centuries. However, these changes are not equivalent to the changes currently referred to as climate change. Although data supports that the Earth's rotation and orbit change the amount of solar energy received, and, thus, alters climate over long time intervals, recent studies support that climate has been drastically fluctuating at an unnatural rate (Carbon Brief, 2011).

Carbon dioxide (CO₂) is a small portion of the makeup of Earth's atmosphere but the fluctuations in CO₂ play a huge role in climate change. CO₂ is a common, naturally occurring gas. We inhale oxygen and exhale carbon dioxide. It is the most natural cycle on Earth, plants take in carbon dioxide and release oxygen.

However, human activities have exacerbated this natural cycle and have offset the amount of carbon dioxide our atmosphere can handle. It is widely accepted that the warming of global temperatures is a direct result of man-made emissions of greenhouse gasses (Carbon Brief, 2011). Burning fossil fuels and stripping the land of trees and plants has increased the amount of CO₂ while decreasing the natural world's ability to offset the emissions. Humans have increased atmospheric CO₂ concentration by 48% since the Industrial Revolution began, a greater leap than what had happened naturally over a 20,000-year period up to 1850. Since 1950, our fossil fuel consumption has increased by 550% while carbon dioxide emissions have increased by 500% (National Aeronautics and Space Administration (NASA)).

Scientists agree the level of CO₂ in the atmosphere needs to stay below 350 parts per million (ppm) to address the catastrophic impacts of climate change. In 2019, CO₂ concentrations surpassed 415ppm in the atmosphere, the first time this has occurred in at least 2.5 million years (NASA). The last measurement recorded on NASA's website during the writing of this conservation plan was 421ppm in April 2023.

The current range of uncertainty lies between 350 ppm and 450 ppm, a threshold that is rapidly approaching. Exceeding 450 ppm will land the Earth in the high-risk zone, a point where there will be irreversible tipping points. There are already irreversible impacts at current CO₂ levels from intense heat waves, heavy rainfall events, increased drought durations, melting ice caps and warming sea levels. There are many ways in which climate

change will impact, and is already impacting, the Youghiogheny River Watershed (NASA and Staeffen, et. al, 2015).

Since the early 1900s, Pennsylvania has recorded an average temperature increase of 1.8° F. Winter temperatures have become warmer at a rate of 1.3 per decade from 1970 to 2000 in the northeast United States. Even more alarming, projections show it could be as much as 5.4°F warmer by 2050 than it was in the 1990s. Since the late 1800s, global temperatures have increased by about 2° F. According to the NASA website on Global Climate Change, 19 of the warmest years have occurred since 2000, with the exception of 1998. The years 2016 and 2020 are tied for the warmest year on record since we started keeping track in 1880 when record keeping began.

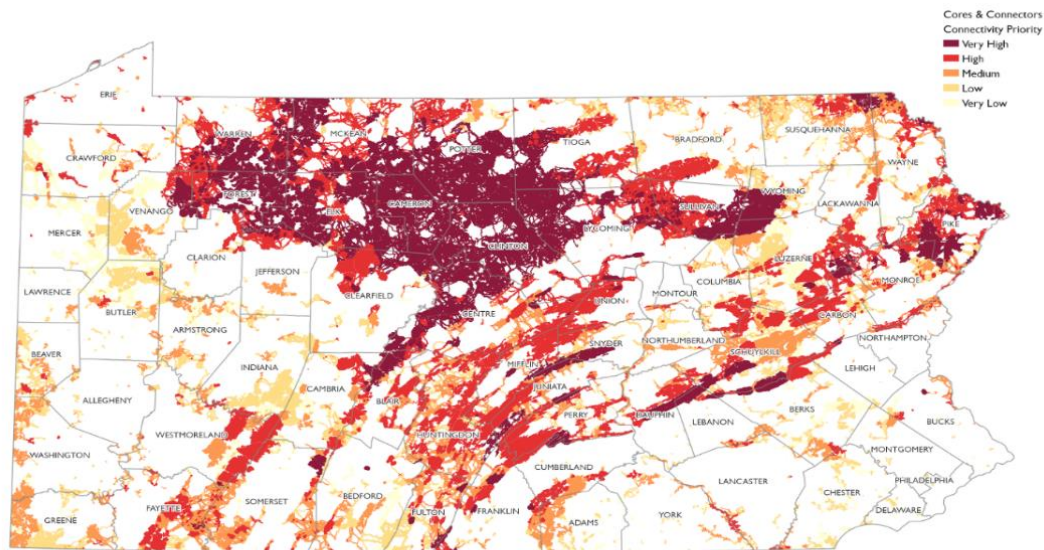
In addition to the higher temperatures, Pennsylvania has also seen an increase in annual precipitation which is expected to increase by 8%, with a winter increase of 14%. Increased precipitation goes hand-in-hand with a higher frequency of large storm events, changes in peak stream flows and decreased snow cover.

The temperature of water in streams is an important factor in maintaining a healthy aquatic ecosystem. However, increased temperatures can lead to warmer streams. This does not sit well with coldwater fish species like Brook Trout. Projections show Pennsylvania could be unsuitable for cold-water fish species by the year 2100 if greenhouse gas emissions are not curbed.

As precipitation changes and temperatures increase, a longer growing season and changes in stream flows are expected to occur. The peak stream flows are expected to occur 10-14 days earlier and summer low-flows are expected to last about a month longer. This could also impact our forest ecosystems that rely on the early spring flows of ephemeral streams.

As the climate changes and plant hardiness zones shift northward at an estimated 13.6 miles per decade, species are inhibited by habitat fragmentation when they would instinctively move north with suitable climate for their habitat needs. Maintaining and restoring habitat connectivity is crucial in a holistic approach to conservation efforts. As mapped out by the Pennsylvania Natural Heritage Program, areas within the Youghiogheny River Watershed range from medium to very high in connectivity priority.

Recommendations set forth in this River Conservation Plan are steps forward in addressing climate change impacts to our regional ecosystems. Efforts to mitigate impacts of severe weather events by repairing riparian buffers, reducing loss of tree cover, and protecting land from habitat degradation are identified. Informed citizens urging others to participate in water and habitat conservation will help mitigate climate change impacts locally.



Climate Change Connectivity Priority Scores

Socioeconomic Profile

Demographics & Population Patterns

The Upper Youghiogheny Watershed occupies approximately 299,811 acres or 468 square miles. Within that area there are 35 municipal units, 7 in Maryland and 28 in Pennsylvania. It is estimated that 55,480 people live in the Casselman River Management Unit. The population by the municipal unit is available in Appendix D.

Land Use Planning & Zoning

Zoning is an important tool available to communities. Although it can be viewed in a negative light as an infringement of landowner rights, when used properly, zoning can help safeguard a community's character. Zoning ordinance gives reasonable consideration to the character of districts and their suitability for particular uses. For example, they encourage orderly development and the most appropriate use of lands.

Ordinances can conserve the value of land and buildings while promoting the conservation of natural resources and can prevent environmental pollution. In addition, they promote health and general welfare, avoid undue concentration of population, and provide for adequate light and air. Ordinances have also been written to secure safety from fire, panic and other dangers; lessen congestion on roads; facilitate the adequate provision of transportation, parking, water, sewage, parks and other public facilities.

The Casselman River Watershed has no county wide zoning. The majority of the Watershed is located within Garrett County, Maryland, and Somerset County, Pennsylvania.

- **Maryland Zoning and Subdivision**

In Maryland, Garrett is the only county that does not have county-wide zoning. The town of Grantsville has its own zoning ordinance that was enacted in 1997 to prevent overcrowding of land, encourage the most appropriate land uses, conserve the value of land and buildings, lessen congestion on the roads and streets, avoid undue congestion of population, provide for adequate light and air, secure safety, and facilitate adequate provision of transportation, water, sewage and other public facilities.

Garrett County has a few subdivision ordinances which are discussed in more detail below.

- **Sensitive Areas Ordinance**

The Sensitive Area Regulation establishes regulations for the following sensitive areas:

Steep Slopes: controls and limits growth on slopes of 30% or more;

Stream Buffers: establishes a 25-foot setback in growth areas and a 50-foot setback in rural areas

Rare, Threatened and Endangered Species: Permits not issued by the county without approval by state or federal agencies where rare, threatened & endangered species or their habitat is impacted

Enforcement of the Floodplain Management Ordinances: to ensure compliance with Maryland's Non-Tidal Wetlands Act

Source Water Protection: establish minimum requirements to protect these resources from contamination

- **Water & Sewer Master Plan**

The Sustainable Growth and Agricultural Preservation Act of 2012 (aka Septic Bill) created four land use categories to identify where major residential subdivisions may be located and what type of sewage system will serve them:

Tier I: currently serviced by public sewage systems

Tier II: planned to be served by public sewage for major subdivisions

Tier III: not planned to be serviced by public sewage. Growth on septic system can occur

Tier IV: planned for preservation and conservation or dominated by agriculture or forest. Major residential subdivisions (more than 7 lots) are prohibited.

- **Accounting for Growth Regulations**
Requires new homeowners to pay an offset fee for nutrients added to the watershed (nitrogen, sediment and phosphorus) from their septic system, or enter into a trading market, or pay a fee
- **Transient Vacation Rental Unit Licensing Ordinance (TVRUs)**
The purpose is to license and regulate the use of residential property rented on a transient or short-term basis.
- **Pennsylvania Zoning and Subdivision**
Somerset County does not have county-wide zoning; however, it does have regionalized zoning around the airport, interchanges, and the Route 31 corridor.

In January of 2022, the Somerset County Commissioners updated the Subdivision and Land Development ordinances that were in place for the county. The new ordinances were put in place to protect and provide for the public health, safety and general welfare of Somerset County residents. The ordinances also guide future growth and development within the county while protecting and preserving the value of land, the natural beauty, topography, and environment of the county while assuring adequate and efficient transportation, sewage, water, facilities, and other requirements.

Some ordinances of importance to the Casselman River Watershed include those for developing campgrounds and/or recreational vehicle parks and wind energy towers.

Income

Appendix E displays the average and median household incomes for each of the municipal units in the region. The median household income is the point where half the people make more and the other half make less; fundamentally it is the middle point. It is used over the mean or average income for statistical analysis because individuals with extremely high salaries may skew the results and bring the average up. Per capita income is another common figure utilized when comparing incomes. Essentially, the per capita income is the average income earned per person (age 15 and older) in a given area and within a specific year (U.S. Census Bureau, 2023).

Poverty

The federal poverty level is a measure used to determine the level of income at which an individual or family qualifies for federal benefits and programs. This level is a set minimum amount that a family needs to provide clothing, shelter, transportation, and other necessities.

As of 2021, 13.5% of the people in the United States are living below the poverty level. Within the Casselman River Watershed, the lowest category of data available

for Maryland and West Virginia is by state. In Maryland, 10.3% of the population are living below poverty levels while in West Virginia its 16.8%. In Pennsylvania, poverty levels are calculated at the county level, so within Somerset County, Pennsylvania the poverty level is 12.1% (U.S. Census Bureau, 2023).

Environmental Justice

Environmental justice is defined as “the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. This goal will be achieved when everyone enjoys the same degree of protection from environmental and health hazards, and equal access to the decision-making process to have a healthy environment in which to live, learn, and work” (U.S. EPA).

- **Maryland**

In Maryland, each census tract is given an Environmental Justice Socioeconomic score that takes into account the community’s minority population, poverty level, and community’s English-speaking proficiency. Communities with 50% or more minorities, poverty rates exceeding 25%, or having 15% limited English proficiency are given higher scores. A score over 75 makes the community eligible for Environmental Justice status. Within the Maryland portion of the Casselman River none of the census tract areas qualify as Environmental Justice Communities.

- **Pennsylvania**

In Pennsylvania, prior to March of 2023, for a community to qualify as an Environmental Justice Area, either 20% or more of the people living in a census tract are living in poverty or 30% or more of the population in the census tract is considered a minority. Somerset Borough, located in the East Branch Coxes Creek subwatershed of the Casselman, makes up Census Tract 211 in Somerset County. This area has been identified as an Environmental Justice Area because 38% of the population are living in poverty.

In March 2023, Pennsylvania rolled out a new program to designate Environmental Justice Areas, adding environmental hazards and risk into the equation. As part of this program, census block groups are re-evaluated every two years to determine their Environmental Justice Area status.

Employment

Within the Casselman River Watershed, approximately 23,316 individuals are in the workforce. Of those individuals 78% work in the state and county in which they reside. Of the remaining individuals, 11% work within the state of their residence but outside the county and 11% work outside the state of their residence.

The majority of the workforce, 71%, has a commute under 30 minutes with 35% percent spending less than 15 minutes. Almost 78% of the workforce drive themselves to work while 7% work from home. This data is based on data submitted in 2020 at the start of the Coronavirus pandemic. This was a changing time in the workforce, with many companies modifying schedules and employees' abilities to work from home.

The top five employment industries within the Casselman River Management Unit include:

1. Manufacturing – 14%
2. Health Care/Social Assistance – 13.5%
3. Retail Trade– 10%
4. Construction – 9 %
5. Accomodations/Food Service – 8.8%

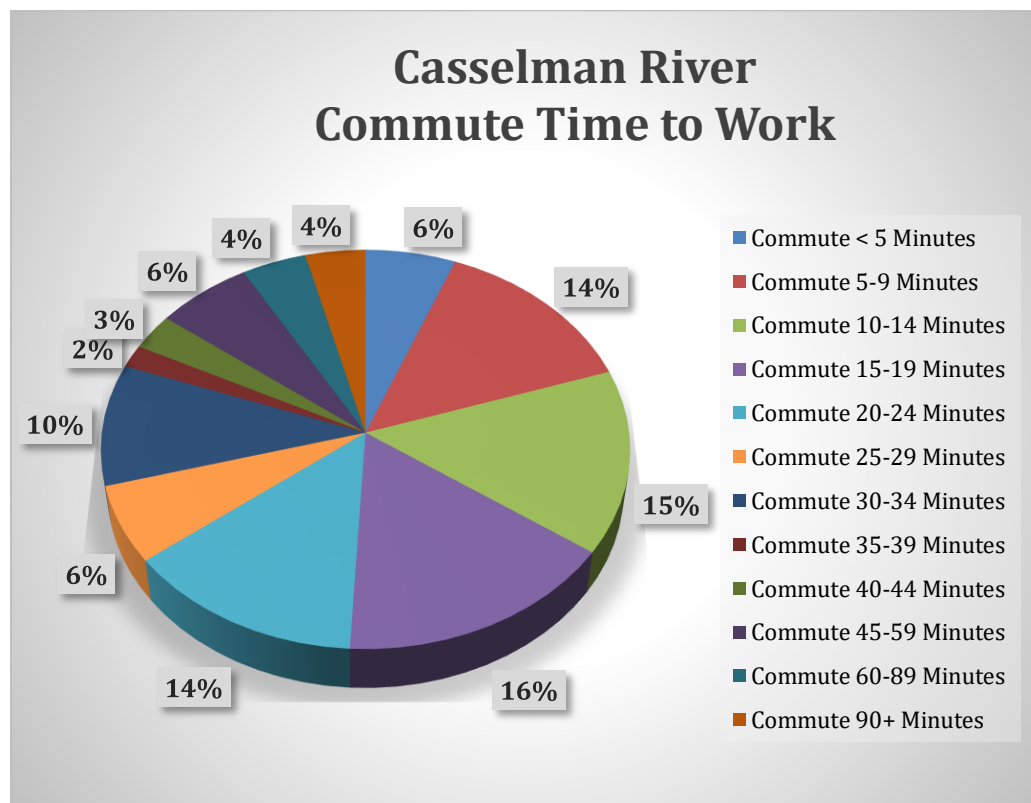


Figure 4-1. Displays the commute times that residents within the Casselman River Management Unit typically spend on a daily basis.

Utilities and Infrastructure

Public utilities vary in their availability, coverage, and reliability within the entire Youghiogheny Watershed. Broadband internet, cell phone service, sewage and drinking water systems that serve the public and their residential and commercial needs, electricity, and natural gas are all examples of utilities that exist in some portion of the Youghiogheny

Watershed. Areas with elevated population density and areas that have increased tourism use are often better equipped than nearby rural areas.

Public Sewage

Public sewer systems are situated throughout the watershed and some systems may transfer water that originates in one watershed to another. Public Sewage is available in Somerset, Confluence, Friendsville, Rockwood, Garrett, Meyersdale, and Berlin. Many other multiple source sewage systems exist including campgrounds.

Public Drinking Water

There are many drinking water systems throughout the watershed. Similar to sewage system infrastructure, the service areas often extend outside of the Youghiogheny River Watershed. Larger utilities include Municipal Authority of Westmoreland County, National Pike Water Authority, PA American Water, North Fayette Municipal Authority, and Indian Creek Valley Water Authority in Pennsylvania. There are 13 drinking water systems operated by the Garrett County, MD Public Works Department.

Internet Services

Internet service is available through DSL or Fiber optic in many parts of the watershed. There are still areas that do not have reliable access. Many internet utilities in the area were expanding their systems during the pandemic due to the increase in demand from business and homeowners.

Natural Gas

Natural gas is available through direct service lines and storage tanks at individual points of use. Service through direct service lines is non-existent in the rural areas. There are many different companies who offer delivery to businesses or homes. Additionally, many offer tank rentals and service contracts.

Education

Maryland operates on county-wide school districts while Pennsylvania area school districts are more community oriented with the potential of having more than one school district per county. The Casselman River Management Unit has nine school districts: Garrett County in Maryland, and in Somerset County Pennsylvania Berlin Brothersvalley, Meyersdale, Rockwood, Salisbury-Elk Lick, Shanksville-Stoneycreek, Somerset and Turkeyfoot Valley.

LAND RESOURCES

Geology

The Casselman River Watershed is located in the Allegheny Mountain Section of the Appalachian Plateau Physiographic Province. It has a series of parallel, rounded ridges-oriented northeast and highly elevated, stream-dissected valleys. During the Permian Period, there was intense folding of the beds in the southeastern part and less intense

folding in the northwestern part. The two major geologic structures are the Negro Mountain anticline and the Deer Park anticline.

The bedrock of the ridges varies from Mauch Chunk, Loyalhanna Formations, and the Pocono Group. The Mauch Chunk Formation is sandstone, shale, and some limestone. The Loyalhanna Formation is made up of sandy limestone, and the Pocono Group is made up of sandstone that has interbeds of shale and siltstone. These bedrock strata formed between the Devonian, Mississippian, and Pennsylvanian periods ranging from 280 to 400 million years ago (Smith, 1998; Wagner and Coxe, 2000).

Soil Characteristics

Soil is a record of the geological climatic history of the region (Blumberg, et. al, 1982). The physical landscape depicts how the land is used; the soil type and conditions influence the determination of these land uses. For example, mining only occurs in areas where coal and limestone deposits exist. In Pennsylvania, the soil is influenced by weathering, vegetation, climate, and time. Sedimentary rocks, such as shale, sandstone, and limestone, are prevalent in the Youghiogheny Watershed and subsequently along the Casselman River.

The development of soil relies on several factors: climate, plant and animal organisms, parent material, time, and differences in elevation. Soils with similar characteristics, such as horizons (soil layers), thickness, and arrangement, are identified as soil series. The influence of each factor of the soil varies, creating the diversity of soil series, both locally and regionally. These series are commonly named after towns or geological features where they were first discovered and mapped. They can differ in texture of the surface soil, slope, and stoniness, among other characteristics. These differences divide the soil series into phases, and the phases are a feature that can be used to determine management practices. It is important to note that there can be several phases within a soil series that can exist.

Individual soils have different characteristics that affect their behavior and may limit some uses. For example, soils with seasonally high-water tables are not ideal for farming as they frequently experience flooding. Therefore, the type of soil determines the use of the land.

Soil Associations

Soil associations consist of two or three major soil types, and a few minor soil types, grouped together. They are landscapes with distinct, proportional patterns of soils. Individual soils can occur in more than one soil association, just in different proportions or patterns. Somerset County has five different soil associations. Of these, only four are found along the Casselman River. Garrett County, Maryland, has six soil associations. Of these, only two are found along the Casselman River. These associations are important, especially to the public, to provide basic information about soils and to provide a general guide for watershed management.

- **Rayne-Gilpin-Wharton-Cavode**

Description- Nearly level to very steep, deep and moderately deep, well-drained to somewhat poorly drained soils; on hills and ridges.

Location- Generally located at nearly level to very steep tops and side slopes of hills and ridges. Predominantly on broad uplands on hills and ridges that are dissected by streams.

Land Use- Mostly used for crops, hay, and pasture. A few areas are used for urban and industrial developments and for surface mining of coal.

Limitations- The moderate depth to bedrock, the slope, and the seasonal high-water table.

- **Hazelton-Cookport**

Description- Nearly level to very steep, deep, well-drained and moderately well drained soils; on foot slopes of hills and on mountains.

Location- Nearly level to the very steep tops and side slopes of hills and mountains. The areas are predominantly on broad mountains and hilly valleys between the mountains.

Land Use- Mostly wooded, except the areas that are cleared for crops, hay, and pasture. A few areas are used for homesites and recreation.

Limitations- Stony soils; the slope; and a seasonally high water table.

- **Berks-Weikert**

Description- Gently sloping to very steep, shallow, and moderately deep, well-drained soils; on hills and ridges.

Location- Gently sloping to very steep tops and side slopes of hills and ridges. The areas are predominantly on broad uplands that are highly dissected by streams and drainage ways.

Land Use- Mostly used for cultivated crops and pastures. A few areas are used for surface mining of coal and for homesites and recreation.

Limitations- The slope and the shallow, moderate depth to bedrock.

- **Leck Kill-Albrights**

Description- Gently sloping to very steep, deep, well-drained to somewhat poorly drained soils; on hills and ridges.

Location- Occupies the gently sloping to very steep tops and side slopes of hills and ridges. The areas are predominantly on broad uplands that are dissected by streams and drainage ways.

Land Use- Mostly cleared for cropland, hay, and pasture. Small areas are used for homesites and recreation. The soils are mostly suited to farming.

Limitations- The slope and a seasonal high-water table.

- **Gilpin-Cookport-Dekalb**

Description- Gently sloping to steep, moderately deep, well-drained, and moderately well-drained soils; formed over acid, gray to yellowish sandstone, and shale.

Location- Extends from the vicinity of Cunningham Lake, north-northeastward through Bittinger and Grantsville to the Pennsylvania line. It

also includes most of the Swallow Falls State Forest and extends southward and slightly westward to the West Virginia line.

Land Use- Large areas are better suited to forage crops and pastures.

Limitation- Difficult onsite sewage disposal by septic tanks because of subsoil wetness, slow movement of soil moisture through the subsoil, and limited depth over bedrock, or slope.

- **Dekalb-Gilpin-Cookport**

Description- Gently sloping to steep, moderately deep, well-drained and moderately well-drained, very stony soils; formed over acid, gray to yellowish sandstone, and shale.

Location- Primarily on the eastern slopes of Backbone Mountain and Big Savage Mountain along the entire eastern part of the county. The other area is irregular and extends over many parts of the county west of Hoop Pole Ridge and Meadow Mountain.

Land Use- Small areas used for forage crops and pasture, but generally used for woodland, wildlife habitat, watershed protection, and outdoor recreation.

Limitation- Not suitable for cultivated crops.

Prime Agricultural Soils

Prime farmland is defined by the U.S. Department of Agriculture as land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops. Additionally, this land has to be available for these uses. It can be cultivated land, pastureland, or forestland, but cannot be urbanized land or water areas. Prime farmland has a dependable supply of moisture, a favorable growing season, acceptable acidity or alkalinity, an acceptable salt and sodium content, few or no rocks, and is not excessively erodible or saturated with water for long periods. The slope is mainly between 0 to 6%. Overall, prime farmland is of major importance in meeting the nation's short and long-range needs for food and fiber and should be used wisely.

There are 20 different prime agricultural soils within Somerset County and Garrett County, Maryland (Natural Resources Conservation Service).



Agriculture is a major land use and identity within the Casselman River Watershed. Hay and pasture combine account for nearly 52% of the land use.

Land Use

The Casselman River Watershed has a heavy agricultural presence; 58% of the watershed land is cultivated for crops and hay/pasture. It also has a significant amount of development as it contains the portions of several boroughs, including Somerset Borough, the county seat. This subwatershed also maintains a decent portion of forest that is typical within the Youghiogheny River Watershed.

TABLE 4-1. LAND USE IN THE CASSELMAN RIVER WATERSHED

Total Acres	Percent	Land Cover Class
1711	1.25%	Barren Land
8496	6.22%	Cultivated Crops
10207	7.47%	Deciduous Forest
499	0.37%	Developed, High Intensity
3542	2.59%	Developed, Low Intensity
1904	1.39%	Developed, Medium Intensity
12701	9.30%	Developed, Open Space
1114	0.82%	Emergent Herbaceous Wetlands
5823	4.26%	Evergreen Forest
70826	51.86%	Hay/Pasture
6338	4.64%	Herbaceous
27960	20.47%	Mixed Forest
1661	1.22%	Open Water
1795	1.31%	Shrub/Scrub
2397	1.76%	Woody Wetlands

Ownership

For this plan, properties are categorized as private property, public lands or state lands.

Private property refers to the ownership of property by private parties, essentially anyone or anything other than the government. Public lands are any lands and interests in lands owned by the United States (U.S.) (Cornell Law School). State lands are properties owned by a U.S. state which provide opportunities for enjoying healthful outdoor recreation and serve as outdoor classrooms for environmental education (DCNR).

The Casselman River Watershed does not have any properties listed as public (*Public Lands*). The watershed does have seven properties designated as State Lands (PAD_StateLands). The northernmost property is an unnamed property totaling

96.4 acres. There are three State Game Lands (SGL), numbers 82, 271 and 231. SGL 82 has 6,731.4 acres in total with about 309.1 acres in the Casselman Watershed. SGL 271 has 1,774.36 and SGL 231 has 461.3 acres in the Casselman Watershed. There is also Forbes State Forest which contains 43,204.55, but it is partially located in a neighboring watershed with about 5,523.37 acres in the Casselman. Mt. Davis Natural Area contains 461.3 acres. Finally, there is the Savage River State Park which has 53,370.4 acres, but most of the property is located outside of the Youghiogheny River Watershed. Given the property’s shape, it is difficult to calculate an accurate acreage estimate for the Casselman River Watershed. Excluding Savage River State Forest, there are about 8,763.73 acres of State Lands in the Casselman River Watershed. (PAD_StateLands).

The remainder of the watershed is privately owned (public lands).

Land Protection

Agricultural Preservation

The Protected Agricultural Lands Database lists 17 properties located in the Casselman River Watershed, totaling approximately 2,026.13 acres. The Casselman River Watershed spans both the states of Maryland and Pennsylvania. There are four Pennsylvania properties, totaling 475.0 acres, in the watershed. The remaining 13 properties are in Maryland, totaling approximately 1,551.13 acres.

Conservation Lands

The Casselman River Watershed has two recorded conservation easements according to the PAD-US Geodatabase. One property is located in Pennsylvania in Somerset County with 33 acres. The Pennsylvania conservation easement was established in 1997 and has a Gap Analysis Project (GAP) Status Code of 2, stating that it is managed for biodiversity (disturbance events suppressed). The Maryland easement is a property split in between Casselman River Watershed and Deep Creek Watershed, totaling 593 acres. The Maryland conservation easement has a number 4 GAP status code meaning there is no known mandate for biodiversity protection.

Critical Areas

Erosion & Sedimentation

Erosion is a natural process where rocks and soil are removed from one location and deposited in another. This process is often aided by human influences, such as vegetation removal along streambanks. With a lack of vegetation along streambanks and steep slopes, loose soil particles become dislodged and can be washed into streams during periods of precipitation. They are carried by the water and will eventually deposit somewhere downstream. The process of sedimentation will potentially change the stream channel's path. This is apparent throughout the Indian Creek Watershed where soil particles have formed islands or point bars. Over time these particles play havoc to the stream habitat needed for many biological species, such as macroinvertebrates. Sediment not only changes the suitable habitat; it impacts the food source for these species along with the physical and chemical properties of the stream. Sediment in the water can even change the water temperature, heating up a cold-water stream. More information about erosion and sedimentation is located in the section on Water Resources.

Fish & Wildlife Habitat

- **Riparian Corridors** are the vegetative areas adjacent to streams, are important to the health of the watershed, providing important habitat that impacts both aquatic life and terrestrial wildlife. By providing shade to the streams, riparian corridors allow streams to maintain cool temperatures that support trout populations and more importantly the macroinvertebrates that serve as the food source for the trout. The plants and shrubs that naturally grow along streambanks also provide adequate shelter for some terrestrial

wildlife. More information about the benefits of riparian corridors is located in the Water Resources section.

- **Floodplains** are natural areas of low-lying ground next to some stream segments that increase the stream's capacity to move water during periods of high flows. These areas tend to have vegetation that is water tolerant and good for absorbing and filtering the stream's excess flow. Floodplains exist for a purpose to provide land for excess water, to decelerate the speed at which it flows, and to alleviate potential flooding downstream. More information about Floodplains is located in the section on Water Resources.
- **Wetlands** are areas of land that for at least part of the year are covered with water, maintain a dominance of water loving plants, and have soils that are hydric or wet in nature. Wetlands are essential as they are sites of groundwater recharge; they are also excellent filtering agents and are essential in flood prevention. More information about Wetlands is located in the Water Resources section.

Hazardous Areas

Coal Mining

Coal mining has occurred for many years throughout Pennsylvania, Western Maryland and Northern West Virginia. Many of the mines were referred to as farmer, wildcat, or punch mines. Both surface and underground mining have occurred and, in some areas, are still present today.

There are 1627 permitted surface mines. Many of these are inactive and some were never approved or in operation. Remediation of many of these sites is completed or ongoing. There are 78 inactive underground mines, and currently 5 active underground mines.

Non-Coal Mining

Mineral mines or quarries are industrial mines where operators are removing rocks like limestone and shale that are later crushed down into various sizes for construction activities.

Often the impacts of quarries are similar to those of coal mining: water quality degradation, increased truck traffic, and air pollution. Damage to homes during blasting can occur. Because rocks, and soil are removed, the topography of the site changes which could lead to a change in natural drainage patterns. The aesthetics of the remaining product scars the landscape and takes years before new trees begin to grow and heal the landscape.

There are 30 industrial mining sites or quarries in the Casselman River Watershed.

Oil and Gas

Natural gas has been extracted from the Youghiogheny Watershed for nearly 150 years. The first documented oil well in Pennsylvania was established in 1859 (Dilmore et al., 2015). Overtime, extracting these resources has been done via conventional or unconventional drilling. Conventional drilling is the most common method. Small conventional well sites are common throughout Appalachia.

Unconventional or hydraulic fracturing is currently banned in Maryland. West Virginia and Pennsylvania have an extensive fracking history and it is currently allowed in both states.

There were 87 oil and gas sites in the Casselman River Watershed. There are 32 active well sites, 50 plugged wells, 4 abandoned, 15 that were permitted and never drilled and 1 that has a “regulatory inactive” status.

Landfills and Illegal Dumpsites

Trash pickup within the watershed is not mandatory, and there are costs associated with having weekly trash pickup. There is one permitted landfill which has a discharge point that flows into the Casselman River. However, some people, in lieu of trash pickup, opt for burning or burying their trash, and others just dispose of it along back roads in illegal dump sites.

Illegal dumpsites along the roadside are not only unsightly but can have environmental, health and safety, and economic impacts that are hazardous to the area. Environmentally, these dumpsites can pollute the soil, air, and water.

Chemicals may leach out into soil, into the water table, and into the streams. If burned, the chemicals in plastics and other items can be released into the air and are toxic to breathe for any one downwind. Illegal dumpsites also pose health and



safety issues, especially to children who may play near the dumpsites. Economically, property values can decrease and property owners held liable, the cost of cleanup can be expensive. Items disposed of at these orphan dumps vary from site to site but typically can contain furniture, household trash, tires, electronics, vehicle parts, paint and other chemicals. There are 58 illegal dump sites documented within the

Casselman River Watershed, although there are frequently new dumpsites reported or sites that lie on private property.

Waste Sites

Waste sites are categorized by two programs: The Resource Conservation Recovery Act (RCRA) and Comprehensive Environmental Response Compensation and Liability Act (CERCLA). The major difference between these two programs is that RCRA regulations are for waste facilities that are currently active in operation where CERCLA manages the remediation of abandoned and inactive facilities.

- RCRA is federal legislation that was passed in 1976 that oversees solid waste from “cradle to grave” or origination to disposal (U.S. Environmental Protection Agency). Regulations are in place to manage generation, transportation, treatment, storage, and disposal. The waste can be in either solid, liquid or a gaseous state. Under the legislation the waste is divided into two categories: Subtitle C – Hazardous waste and Subtitle D - Non-Hazardous waste. Although underground storage tanks are managed as a non-hazardous waste, they have been separated here to give them the attention they need.
 - Hazardous Waste is managed by the United States Environmental Protection Agency (U.S. EPA) although they may authorize state agencies to implement key provisions of the hazardous waste requirements. A hazardous waste is any waste that is ignitable, corrosive, reactive, or toxic. There are 39 sites regulated under RCRA in the Casselman River Watershed. Of these, 36 are Hazardous Waste Generators and three are inactive Hazardous Waste Treatment Facilities. More information about the specific sites is located in Appendix E.
 - Non-Hazardous Waste is managed by states however the Environmental Protection Agency sets minimum standards for how facilities should be designated and operated. This includes the issuance of permits that ensure compliance and federal criteria for municipal and industrial waste landfills. The practice of open dumping is banned. Individual states may implement more stringent requirements.
 - Underground storage tanks are also regulated as a Non-Hazardous Waste. In order to be classified as an underground storage tank, the tank, combination of tanks and piping must have at least 10% of its combined volume underground. Underground means below the surface and surrounded by soil. A fuel tank in a person’s basement is not considered an underground storage tank. In Pennsylvania, storage tanks must

be registered annually, and a valid operating permit is required before operations can start. Within the Casselman River Watershed there are currently 62 active underground storage tanks and 109 inactive USTs in Pennsylvania. There are several more in Maryland. A listing of all the tanks active, closed and removed is located in Appendix F.

- The Comprehensive Environmental Response Compensation Liability Act (CERCLA), more familiarly known as Superfund, investigates and cleans up sites contaminated with hazardous substances. The United States Environmental Protection (US EPA) agency was granted responsibility for overseeing cleanup activities at uncontrolled or abandoned waste sites as well as accidents, spills, or other emergency releases of pollutants and contaminants. When responsible parties can be identified, their participation can be assured through orders, consent decrees or small party settlements. Costs are also recovered from financially viable individuals or companies upon completion of the cleanup action. When a responsible party cannot be identified, the US EPA ultimately cleans up the site.

Across the country more than 40,000 Superfund sites exist. The worst of these sites requiring long-term remediation are put onto a list known as the National Priorities List. No National Priority List or active Superfund sites exist in Casselman River Watershed.

Brownfields

Brownfields are defined as any previously developed property that has been contaminated by hazardous waste and identified by the United States Environmental Protection Agency as a candidate for cleanup. These sites possess a risk to human health and/or the environment. Expansion, redevelopment or reuse of the land may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant.

There are 15 land restoration projects that have been identified in the Casselman River Watershed.

Landslides

“Landslides are a natural geological process involving the movement of earth materials down a slope” (Delano & Wilshusen, 2001). Because of the damage that can occur to buildings, roadways, etc. they are deemed a significant geological hazard. The extent of damage from landslides does vary depending on location, the amount of earth that is moved, the speed at which it moves, and any influences by humans.

A landslide occurs naturally when land, including rocks, soils, earth, and soil slip or move. This typically occurs due to certain geological features and gravity. It is also aided by heavy periods of precipitation that saturate the soil and by human influences. Human influences, such as construction activities, modify the slope leaving some areas susceptible to landslides.

The Youghiogheny Watershed is highly susceptible to landslides. In June 2021, the hillsides above Yough Lake along Route 40 had a massive movement and closed the main transportation route for several weeks.

Sinkholes/Mine Subsidence

“Sinkholes are a subsidence feature that can form rapidly and are characterized by a distinct break in the land surface and downward movement of surface materials into the resulting hole or cavity” (Kochanov, 2015). Although sinkholes can occur naturally, it is more prevalent in central and eastern portions of Pennsylvania where carbonate bedrock exists.

That does not mean the Youghiogheny Watershed is immune. Human influences such as underground mining, installation of utilities underground, or excessive pumping of groundwater can also cause subsidence leading to the development of sinkholes. Technically when subsidence is caused by mine drainage, it is termed mine subsidence rather than a sinkhole.

WATER RESOURCES

The Casselman River, a tributary to the Youghiogheny River, originates from Savage River State Forest in Garrett County, Maryland. Flowing north into Pennsylvania, it drains a majority of southern Somerset County and empties into the Youghiogheny River at Confluence below the US Army Corps of Engineers' flood control dam.

The total area of the watershed consists of approximately 248,481 acres, 388.2 square miles or 56 miles. It is situated in the upland plateau of the Appalachian Physiographic Providence and flows from an elevation of 2050 feet above sea level in Maryland. The more prominent ridges are Laurel Hill to the West and the Allegheny Mountain to the east.



Casselman River in Grantsville, Maryland

A Pennsylvania Department of Conservation and Natural Resources (PA DCNR) River Conservation Plan was developed in 2001 for the Casselman River corridor. This new Plan will update the

information and form the foundation to develop new studies and restoration projects within the watershed.

Water Quality

In 1993, a large amount of acid mine drainage entered the Casselman River in Pennsylvania and caused a fish kill. It was caused by a combination of illegal pipes by a mining company, discharging directly to several tributaries but also by a rapid snow melt that flooded older mine workings. In all, roughly 60,000 fish were killed in this incident. Other large AMD discharges currently enter the river from the Shaw Mines Complex, a 1900s era 5,000-acre underground mining complex. Wilson Creek also drains a large underground mining complex in the Blackfield/Wilson Creek area around Rockwood. Past studies of the Casselman listed over 300 abandoned mine drainage (AMD) seeps/discharges in the watershed.

Although the Casselman River Watershed has historically been a river polluted by industrial and mining activities, it has made a substantial comeback and provides whitewater boating and fishing opportunities. However, the watershed in both states still faces pollution today from untreated sewage discharges, sediment runoff from development and agriculture and abandoned mine drainage.

Current Conditions

Water Quality Standards are the foundation of the water quality-based control program mandated by the Clean Water Act. These Standards form the legal basis for controls on the amount of pollution entering waters from sources such as industrial facilities, wastewater treatment plants and storm sewers. Standards are also the technical basis for reducing runoff from rural and urban areas. A Standard can consist of either numeric or narrative limits for a specific physical or chemical parameter. When a stream or lake that is not meeting adopted water quality standards, the assessment may lead to a determination of impairment, initiating further action such as a Total Maximum Daily Load limit (TMDL) or other regulatory procedure. These rules spelled out the “designated uses” for the waterways. The designated uses are Aquatic Life and Human Health with various subcategories such as Contact Recreation. If these designated uses were not being attained in a particular waterway, then the stream was deemed to be impaired.

The Maryland Department of the Environment classifies all surface waters into four categories or “uses.” All waters receive at least a Use I designation which means they are suitable for contact recreation, fishing and protection of aquatic life and wildlife. Use II water is suitable for shellfish harvest. Uses III and IV are designated as Non-Tidal Cold Water and Non-tidal Cold Water Recreational Trout Waters. The Youghiogheny River and most of its tributaries are protected as Use III-P (“P” adds the protection for use as a public water supply). Most of the tributaries of the Casselman River are classified as Use III. However, sections of Piney Run and the main stem of the Casselman below and including Crab Run and Slaubaugh Run to

the Maryland-Pennsylvania border are designated as Class IV (Recreational Trout Waters).

An added designation to the protection of streams is a Tier Class I, II, III designation. There are no Tier I or Tier III designations in Maryland's Casselman. However, there are several Tier II (High Quality) designations. Puzzley Run, sections of the South Branch and the main stem of the Casselman are listed as Tier II waters.

Pennsylvania lists their streams as Exceptional Value (EV), High Quality Coldwater Fisheries (HQ-CWF), Coldwater Fisheries (CWF), Trout Stocked Fisheries (TSF), and Warm Water Fisheries (WWF). In addition, the Pennsylvania Fish and Boat Commission added further designations to streams such as: Wild Trout Fisheries and Class "A" Wild Trout Fisheries. The majority of the streams in the Pennsylvania portion of the Casselman are designated CWF or WWF. Two major tributaries, Laurel Hill Creek and Whites Creek are listed as HQ-CWF. Isers Run and Laurel Hill Creek tributaries of Jones Mill Run and Blue Hole Creek are listed as EV streams.

Many of the streams within the Casselman Watershed in both states are attaining their Designated Uses for Recreation, Water Supply and Aquatic Life. The two largest impairments in both the Maryland and Pennsylvania Casselman River are: 1) low pH and metals from abandoned mine drainage; 2) siltation and sediment runoff from mining sites, agriculture, and lack of riparian buffers. Chlorides are a newer type of impairment that the states are starting to address. Maryland has a Water Quality Assessment completed for chlorides.

According to the 2022 Integrated Report from both Maryland and Pennsylvania, the streams listed as impaired from the 2000 Report continue to show the same impairments for Aquatic Life but attain their Designated Use for Drinking Water and Recreation. Appendix G, lists the streams identified as impaired for the Casselman River Watershed.

Point Source

For discharges from a point source (basically a pipe), a National Pollutant Discharge Elimination System (NPDES) permit is required. Both Pennsylvania and Maryland issue the majority of NPDES permits for sewage, industrial waste, stormwater, concentrated animal feeding operations and biosolids.



Point source discharge are known discharges typically coming from a pipe

NPDES permits issued in the Casselman River Watershed are identified in Appendix H.

Nonpoint Source

In both Pennsylvania and Maryland, nonpoint source pollution originates from many sources: abandoned mine drainage, agriculture, silviculture, urban/rural/industrial run-off, failing septic systems, and atmospheric deposition. Several tools are available to the states in order to help assess and restore impaired streams.

Watershed Implementation Plans (WIP) are developed and funding from the Federal Clean Water Act Section 319 Program is used to implement restoration projects. Another tool used to reduce nonpoint pollution is to develop a TMDL (Total Maximum Daily Loads) for a particular watershed. A TMDL is the amount of pollutant loading that a waterbody can assimilate and meet water quality standards. If a TMDL or a WIP is not needed, then a Water Quality Assessment is a final tool that a state could use to address the impaired stream and restore it. All of the planning tools/assessments must be approved by the US Environmental Protection Agency.

TMDLs for the watershed have been written in both Pennsylvania and Maryland. Maryland's TMDLs are for low pH (April, 2008), Big Piney Reservoir for Mercury (February, 2004), Biological Stressor Identification Report which looked at TSS (Total Dissolved Solids, specifically Nitrogen and Phosphorus) (June, 2010) and Nutrients (December, 2000). Water Quality Assessments were completed for Chlorides in 2022 and Eutrophication in 2001. Pennsylvania's TMDLs were for Mine Drainage Affected Streams that targeted metals and low pH (May, 2009).

Source Water Protection

The Safe Drinking Water Act allows the states to initiate a program to assess the vulnerability to contamination of all public drinking water sources. The effort encompasses both large and small water systems. Water can be pulled from many different groundwater aquifers, springs or even surface flow from a river or stream. Table 4-2 below lists the Source Water Assessment Plans for the Casselman River Watershed.

TABLE 4-2. SOURCE WATER PROTECTION PLANS FOR THE CASSELMAN RIVER WATERSHED

Maryland

Number	Name	Type	Source
1110003	Clayburn New Savage Plant Water System	2 Wells	South Branch Casselman River
110205	Goodwill Mennonite Home Water System	4 Wells	Staubaugh Run
110005	Town of Grantsville Water System	4 Wells, 4 Springs	Little Shade, Spiker, Puzzley Run
1110013	Yoder Meat Packing	3 Wells	Big Shade Run
001-0011	Piney Reservoir	Surface	Reservoir

TABLE 4-2. SOURCE WATER PROTECTION PLANS FOR THE CASSELMAN RIVER WATERSHED

Pennsylvania

Number	Name	Type	Source
4560042	Borough of Somerset Municipal Authority	4 wells	Coxes Creek
4560020	Rockwood Boro Municipal Authority	2 wells	Near Casselman River
4560012	Meyersdale Municipal Authority	Surface	Stamm Run
5260041	Salisbury Comm of Water Works	Spring	Findley Spring

Source: Maryland and Pennsylvania Source Water Programs

Lakes and Reservoirs

- **Piney Reservoir**

Piney Reservoir (also known as the Frostburg Reservoir) is the largest lake in Maryland's Casselman River. This serves as the drinking water supply for Frostburg. The reservoir's surface area is 120 acres with a maximum depth of 35 feet. The upper shallow end of the lake has growth of aquatic vegetation during the summer, providing habitat for many fish species. In the lower half of the lake an area of standing timber creates excellent largemouth bass habitat. This lake is not used for boating type recreation or swimming. Fishing is allowed from shore only.

From a water quality standpoint, it is good. However, the reservoir is impaired with mercury, but the water quality shows that the mercury is below detection limits. Therefore, the water is safe for drinking water purposes. There are fish consumption limits posted at this lake.

- **High Point Lake**

High Point Lake - located near Mount Davis, the highest point in Pennsylvania. It was created by damming Glade Run to create a 338 acre, 37-foot-deep lake. It is owned by the Commonwealth of Pennsylvania and managed by the Fish and Boat Commission for public fishing and boating.

Water quality is attaining the designation used for Recreation and Aquatic Life.

- **Deer Valley Lake**

Deer Valley Lake, also near Mount Davis, was created by impounding Cove Run to create a 172-acre lake. The YMCA of Pittsburgh owns the lake and surrounding lands for family camping adventures. Water quality is good and is attaining its Uses for Recreation and Aquatic Life.

- **Lake Somerset**

Lake Somerset is a 253-acre impoundment on the East Branch of Coxes Creek. It is owned by the Commonwealth of Pennsylvania and managed by the Pennsylvania Fish and Boat Commission for public boating and fishing. The lake is managed under the “Big Bass Program” regulations. It was drained a few years ago to allow the dam to be replaced. It has been repaired and water is now returning to the lake. Currently, there are no water quality issues. It is attaining its Designated Use for Recreation and Aquatic Life.

Water Quantity and Climate Change

In Pennsylvania, the climate has undergone a long-term warming of more than 1.8°F over the past 110 years. The climate has also become wetter, with an average of a 10% increase in the amount of precipitation in certain areas of the state. Pennsylvanians can expect to see an additional 8% increase in precipitation by 2050. Current annual precipitation is between 40-46 inches.

The headwaters of the Casselman River in Maryland’s elevation and location combine to produce a mean annual precipitation of 47.3 inches, an average annual snowfall of 97.0 inches and the lowest mean annual temperature (47 degrees F) among Maryland’s 23 counties. The widely varying topography is also an important factor contributing to marked differences in climate within the county. On the southern facing valleys and slopes, temperatures are generally warmer and precipitation is less than the northern facing areas. These microclimates can produce substantially varying weather patterns.

The National Oceanic and Atmospheric Administration (NOAA) has suggested that Maryland’s temperatures will continue to increase. The temperatures have already increased 2.5°F over the last century. Historically unprecedented warming is projected during this century.

For both states, heat waves are projected to be more intense, while cold waves are projected to be less intense. Precipitation is projected to increase, particularly in the winter and spring but with less precipitation in the form of snow for the winter months. The frequency and intensity of extreme precipitation events are also projected to increase, which could increase the risk of flooding. Maryland and Pennsylvania have a west-to-east

pattern in temperature. Larger seasonal variations occur in the highlands west in the Appalachian Mountains.

Important Components of Watershed Health

Wetlands

Wetlands are areas of land that, for at least part of the year, are covered with water. They also maintain a dominance of water-loving plants and have soils that are hydric or wet in nature. Wetlands are essential because they are sites of groundwater recharge; they are excellent filtering agents and are essential in flood prevention. In the Casselman River area of the Youghiogheny Watershed, there are 6,806 acres of wetlands.

Wetlands are broken down and classified into systems. Within the Casselman River area, wetlands are Palustrine, Riverine, or Lacustrine. Palustrine wetlands are in non-tidal areas that are dominated by trees, shrubs, persistent emergent, and emergent mosses or lichens (National Wetlands Inventory, 2019). According to the National Wetland Inventory, the Casselman River area has 4,304 acres of Palustrine wetlands. Most of these wetlands are forested (1,617 acres), scrub-shrub (1,410 acres), and emergent (760 acres). Forested wetlands are characterized by woody vegetation that is 20 ft tall or taller. Scrub-shrub wetlands include areas that are dominated by woody vegetation less than 20 ft tall. Finally, emergent wetlands consist of perennial plants, excluding mosses and lichens, that are the tallest lifeform with at least 30% areal coverage. The remaining area of the Palustrine wetlands is unconsolidated bottom and unconsolidated shore. Unconsolidated bottom wetlands are considered deepwater habitats with at least 25% cover of particles smaller than stones and a vegetative cover less than 30%. Unconsolidated shore consists of landforms such as beaches, bars, and flats (National Wetlands Inventory, 2019).

The Casselman River area also contains 1,591 acres of Riverine wetlands. Riverine wetlands contain deep water habitats that are contained within a channel (National Wetlands Inventory, 2019). These channels are open conduits that are created naturally or artificially, and they periodically or continuously contain flowing water. Additionally, these conduits provide a link between two bodies of water (National Wetlands Inventory, 2019).

Other than Palustrine and Riverine wetlands, Lacustrine wetlands make up for 911 acres of the Casselman River area. Lacustrine systems include wetlands and deepwater habitats within a topographic depression or a dammed river channel, lacking trees, shrubs, persistent emergents, and emergent mosses or lichens with 30 percent or greater coverage, and total an area of at least 20 acres (National Wetlands Inventory, 2019).

Floodplains

Floodplains are another important component to watershed health. These are areas of low-lying ground next to stream segments that increase the stream's capacity to move water during periods of high flow. Flood areas were calculated from the National Flood Hazard Layer provided by FEMA (FEMA, 2021), and land cover data (MRLC, 2019) was used to determine if the area was developed, natural, or farmland. The Casselman area has a total of 10,984 acres of floodplains. Of that 10,984 acres, 995 acres are developed, and 1,986 acres are farmland. The remaining 8,003 acres are natural. It is critical that these areas remain undeveloped. Development in floodplains annihilates the safety net they provide and can result in flooding downstream. Cutting down trees, mowing riparian buffers, and development in floodplains is done at their peril. Communities that have participated in these activities often wonder why they are now experiencing flooding and bank erosion.

Riparian Corridors

The 8,003 acres of natural floodplain areas in the Casselman River area are considered riparian corridors. Riparian corridors are vegetated areas of land adjacent to streams. They, too, play an important role in stream health. They are the interface between terrestrial and aquatic ecosystems (Oates, 2000). The wider the buffer, the more effective it functions. Riparian vegetation typically includes trees, shrubs, and grasses that depend on wet environments to survive. Buffers provide many benefits to area streams including: reduction of water temperature; pollution, sediment, and nutrient trapping; channel stability; flood control; providing habitat; economic value; and recreational and aesthetic values. It is critical that these areas remain undeveloped.

Water Quality Monitoring

Socioeconomic activities, urbanization, industrial operations, and agricultural production influence the environment and have increased dramatically during the past few decades, affecting freshwater environments (UNEP and WHO, 1996). These human induced impacts have created a pressing need for comprehensive and accurate assessments of trends in water quality, a need to address the consequences of present and future threats of contamination, and a need to provide a basis for action at all levels. Reliable monitoring data is the essential basis for such assessments. Monitoring is important as it provides information that permits rational decisions to be made on describing water



Survey crews comprised of staff from Mountain Watershed Association, Western Pennsylvania Conservancy and Jacobs Creek Watershed Association searched for the Eastern Hellbender salamander in the Casselman River in 2023

resources and identifying actual and emerging problems of water pollution; formulating plans and setting priorities for water quality management; developing and implementing water quality management programs; and evaluating the effectiveness of management actions.

Chemical Water Monitoring

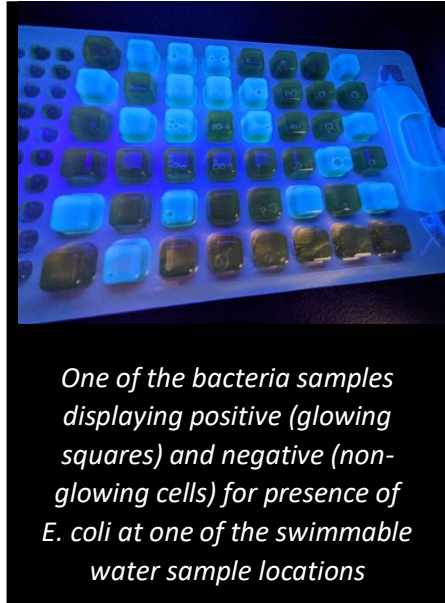
Chemical water monitoring is the sampling and analysis of water constituents and conditions (EPA, 2009) . These may include introduced pollutants, such as pesticides, metals, and oil; constituents found naturally in water that can, nevertheless, be affected by human sources, such as dissolved oxygen, and nutrients. Minimal chemical sampling has been completed in the Casselman Watershed. From 2009 to 2020, the Southern Alleghenies Conservancy completed chemical sampling at a passive treatment system in the Upper Casselman River Watershed. The Municipal Authority of Westmoreland County has been on the mainstem of the Casselman River for short periods from 2010 to 2012, and then again from 2020-2023.

Biological Sampling

Biological sampling is an evaluation of the condition of a waterbody by sampling species that spend all or part of their lives in that waterbody. Sampling is conducted to gather a representative sample of the biological community located in the waterbody (USEPA, 2011) . For each site sampled, specific attributes, known as biological indicators, are compared to the conditions expected for that indicator based on reference sites. Biological indicators may include fish, benthic macroinvertebrates, algae, amphibians, aquatic plants and birds. Data collected at reference sites provide a benchmark for assessing the biological condition of surveyed sites. Metrics are quantitative measures of biological indicators and can provide information on both the present and past effects of anthropogenic stress on aquatic systems. Physical and chemical changes in freshwaters can produce diverse biological effects ranging from severe, such as a total fish kill, to subtle, such as changes in enzyme levels or subcellular components of organisms. These sorts of changes can indicate that the ecosystem is under stress and that it has become unbalanced. As a result, there could be possible implications for the intended uses of the water and even risks to human health. Biological sampling is important as it provides a baseline to help ensure that the quality of waters and their associated aquatic life uses are protected and maintained. Abundant biological sampling has occurred in the Maryland portion of the Casselman River Watershed through the Maryland Biological Stream Survey (MDDNR, 2009). Streams are selected randomly throughout the year across the state. Sampling within the watershed appears to have begun in 1995. Information can be found on their interactive map. (<https://maryland.maps.arcgis.com/apps/webappviewer/index.html?id=30ee9336f8d54e4ebf971c3a1a7576ed>).

Bacteria Sampling

Bacteria present in water is one of the most important water quality issues world-wide, specifically to sources of drinking water and water used for water contact recreation. Testing can be conducted to monitor compliance of NPDES permit discharges for fecal coliform. This is necessary as there are known facilities that consistently exceed their permitted discharges in the watershed. Any summer swimmable waters that are popular in the watershed need to be tested for E. coli for the protection of the community.



One of the bacteria samples displaying positive (glowing squares) and negative (non-glowing cells) for presence of E. coli at one of the swimmable water sample locations

Bacteria sampling is also occurring within the Casselman River Watershed through the Swimmable Waters Project. During the swim season in Pennsylvania, May 1-September 30, popular swimming holes in the Youghiogheny River Watershed are being monitored weekly by MWA. A few of those locations are within the Casselman River Watershed. Samples are collected and brought to the Mountain Watershed Association office in Melcroft, Pennsylvania, where they are processed and analyzed at an in-house laboratory within 24 hours.

BIOLOGICAL RESOURCES

Natural Setting

The Youghiogheny River Watershed has a rich history. It has experienced industrial impacts, such as mining, for both coal and minerals, hydroelectric dams, and wind turbines. It also has a vast amount of agriculture, as well as natural space with numerous state and federal lands available for recreation by tourists and local residents.

The Upper Youghiogheny River Management Unit is located within the Appalachian Plateau in Maryland and within the Allegheny Mountain Section of the Appalachian Plateau Province in Pennsylvania. It is known for having the highest elevations that parallel mountain ridges separated by deep gorges creating whitewater conditions.

Through the years of colonization, invasive invaders and natural events, the landscape in the watershed has evolved. Impacts of past colonization such as mining, logging, and agriculture have left their scars, but foreign invaders like invasive species have also had dramatic impacts, especially on the hemlocks, ash, and chestnut trees. This does not even take into account the amount of sprawl that the watershed has experienced with vacation homes and rentals, four season resorts, along with infrastructure to support these tourists.

Most of our landscape is composed of second and third growth stands of timber containing maples, oaks, Black Cherry, and Tulip Poplar trees. Rhododendron, Mountain Laurel along with blackberries, blueberries and huckleberries are common. Fortunately, the area has maintained some of the oldest, old growth forests remaining in both Pennsylvania and Maryland along the Youghiogheny River due to the numerous amounts of state park and forest lands in the states.

Of the eight classes of forest growth in Maryland, the western portion of the state is located within the Northern Hardwood, White/Red/Jack Pine, Elm/Ash/Cottonwood, and Exotic Softwoods according to the United States Department of Agriculture Forest Service. The Northern Hardwood Forest contains a variety of beech, birch and maple trees that are common within the Appalachian Plateau where the elevation is higher and the climate is cooler, providing favorable growing conditions for the northern tree species.

In the Pennsylvania portion Appalachian Hemlock Northern Hardwood forests are typically found containing cool, moist slopes containing eastern hemlocks, maple, beech, poplar and birch species. There is also a North Central Interior Floodplain Forest especially along rivers and bottomlands. River scour communities or communities where the force of the flow has caused the removal of sediment from the streambed or streambanks of a waterbody, such as along the Youghiogheny River, provide habitat for many rare plant species. This watershed boasts of diversity for natural communities, including but not limited to streams, ponds, lakes, wetlands, grasslands, open marshes, bogs, swamps, floodplains, forests, marshes and vernal pools.

Biodiversity

Clean air, clean water, and fertile soils are required for a healthy ecosystem that benefits everyone and everything. Having a diversified population of plants and wildlife is essential, and the more diversified community of organisms increases that ecosystem's resilience. A resilient ecosystem is important especially with all the stresses and challenges organisms face to survive between predators and invasive species.

Over the next few sections, the biodiversity that this watershed contains will be discussed in much further detail through natural heritage areas, species of concern, species of greatest conservation needs, important bird and mammal areas.

Species of Concern/Species of Greatest Conservation Need

Several species classified as rare, endangered, or threatened reside in the Youghiogheny Headwaters Management Unit. These include several species of plants, fish, amphibians, reptiles, birds, and mammals.

Species of Special Concern

Species of special concern (rare, threatened, or endangered species) are tracked by the state and federal natural resource agencies. It is a matter of policy for the resource agencies not to provide specific site location information in order to provide a level of protection to these organisms and their critical habitats. The state

natural resource agencies are to be contacted if any land disturbance activities are planned to determine if those activities could potentially impact any species of special concern or their habitat.

Species of concern in Garrett County, Maryland, consist of 16 species of mammals, 23 bird species, 4 reptiles, 5 amphibians, 4 fish, 26 insects, 12 butterflies/moths, and 2 flatworms. In West Virginia, there are 21 federally endangered species, 7 federally threatened species, 3 species proposed for listing and 1 candidate species.

In Pennsylvania, the Casselman River Watershed is home to 13 species of concern. Eight of those species are protected by the Pennsylvania Game Commission and five by Pennsylvania Fish and Boat Commission.

Species of Greatest Conservation Need

Species of Greatest Conservation Need (SGCN) include plants and animal species in which the species themselves or their habitat are declining to a level of concern. This listing is a broader group than the species of concern, but the species of concern are also identified as SGCN. The purpose of identifying these species is so that conservation activities and protections can be made in an effort to keep them from being identified as a rare, threatened or endangered species.

In Maryland, currently this data was only available to by state. Many of the species in this listing may not reside in the Youghiogheny Headwaters portion of the watershed, for example the bottlenose dolphin. Within Maryland there are 41 mammals, 143 birds, 26 reptiles, 19 amphibians, 31 fish, 272 insects—36 bees/wasps, 101 butterflies/moths, 93 dragonflies/damselflies, 14 mayflies/stoneflies/caddisflies—and 78 other invertebrates that include 14 snails, 14 freshwater mussels, and 10 flatworms.

In Pennsylvania, there are 83 individual species residing within the Casselman River Watershed identified as SGCN. Of those listed there are five bird, one mammal, one invertebrate and a sensitive species not identified that are listed as being globally or regionally important. A full listing of species is available in Appendix I.

Invasive Species

Numerous invasive species are found in the watershed. An invasive species is defined by the United States Department of Agriculture (USDA) Forest Service as “a species that is non-native to the ecosystem under consideration; and, whose introduction causes or is likely to cause economic or environmental harm, or harm to human health” (Executive Order 13112). There are both plant and animal invasive species within the watershed boundary.

Invasive species can be damaging to native species, infrastructure, agriculture, and ecological processes vital for native and foundation species. The ecological impacts of invasive species vary depending on the species and its means of taking over an area.

Many invasive species are nearly impossible to control once they have taken over an area. In all cases, prevention and early treatment is of utmost importance. The USDA Forest Service recommends the following management practices to prevent the introduction of invasive species:

1. Inspect any plants or trees for egg masts or plant seeds before bringing them into the watershed or transporting them between watersheds.
2. Inspect and clean any forest machinery for egg masts or plant seeds before transporting the equipment between watersheds.
3. Inspect and clean all fishing, kayaking, or boating equipment using hot water and letting dry completely before entering a different body of water.
4. Limit transport of firewood from far away areas into the watershed; find locally sourced firewood.

Plants

Invasive plants have a tendency to displace natives and dominate landscapes, especially areas that have recently been disturbed. Some invasive plants, such as the ground vine mile-a-minute, smother natives. The invasive tree-of-heaven produces a chemical in its roots that prevents the establishment of other plants (Jackson and Grover). Others outcompete native plants for sunlight and nutrients. Once an invasive plant is introduced to an area, especially after a land disturbance has occurred, it often takes over the area and spreads rapidly. This causes issues for wildlife, including lack of necessary food resources from native plants and inability to traverse through thick stands of some invasive plants.

- **English Ivy**, originally brought to the United States as an ornamental plant, quickly escapes when not maintained. It is able to climb vertical structures and produces berries that are carried from one place to another by birds. Once established in natural areas, the ivy quickly covers the ground surface eliminating habitat for native plants. The ivy can smother tree canopies, adding weight and increasing the tree's susceptibility to windthrow. In addition, tree trunks covered in the ivy hold in moisture providing protection of borers and other insects. (Maryland Department of Natural Resources, 2016).
- **Japanese Stiltgrass** occurs in uplands and wetland habitats. It is believed to have been introduced in the United States in the early 1900s from eastern Asia coming in packaging materials. It establishes a lush green carpet where the grass crowds out native plants, especially in shady conditions. It can remain dormant in soil for many years, making management and eradication efforts challenging. (Maryland Department of Natural Resources, 2016).
- **Japanese Knotweed** was introduced from East Asia in the late 1800s as an ornamental plant to help stabilize streambanks. It spread profusely, dominating native plants in wetlands, stream corridors, forest edges,

drainage ditches, etc. It can grow up to 11 feet and due to its extensive network of underground rhizomes, it is very difficult to eradicate and control.

Japanese knotweed has multiple impacts to land and streams. The dense thickets of knotweed outcompete native species due to its deep root system, making it difficult for other species to grow. It compacts the soil, limiting its ability to absorb water and nutrients which results in a decrease of food and habitat available for birds and other wildlife. These deep roots can cause streambanks to erode, increasing flooding. The plants release toxic chemicals to wildlife that eat them as well as to area streams. These chemicals then degrade the water quality and harm aquatic life such as fish and macroinvertebrates.

- **Garlic Mustard** was introduced in the United States in the 1880s brought in by early settlers to New York for medicinal purposes. This flowering herb spreads rapidly through upland forest habitats where it outcompetes native plants. It is especially concerning because certain rare butterflies lay their eggs on it instead of on native species. When the eggs are laid on garlic mustard, they fail to develop. Like stiltgrass garlic mustard is hard to eradicate because it can remain dormant for five years (Maryland Department of Natural Resources, 2016).
- **Purple loosestrife** was introduced to Maryland in the 19th century. It arrived in ships' ballast water and attached to other materials. It was imported as a medicinal and decorative plant. While the plant is attractive it reproduces quickly and outcompetes native plants, disrupting food chains and habitats in wet areas and marshes (Maryland Department of Natural Resources, 2016).
- **Wavyleaf Basketgrass** is a recent invader to the Maryland ecosystems, being first detected in 1996 before expanding to various parks and natural areas in the 2000s. Like most invasives it spreads quickly by creating dense mats of shade-tolerant grass that cover the forest floor. They easily adhere to passing animals, people and equipment only to fall off later, traversing large distances from the initial plant. It is a worthy target for eradication because its presence is limited to Maryland and Virginia. (Maryland Department of Natural Resources, 2016).
- **Phragmites** dominate native wetlands plants including native varieties of phragmites. They first arrived in Maryland in the 18th century.
- **Kudzu** was introduced to the United States from Asia during the 1876 World's Fair in Philadelphia, Pennsylvania. During the Great Depression, it was touted as a way to reduce farmland erosion. It is a deciduous, climbing,

semi-woody perennial vine that can grow 35-100 feet long. It spreads via runners, rhizomes and from nearly every node that touches the ground. In its third year it produces flowers from June to September. It spreads rapidly in open areas including disturbed areas such as abandoned fields, roadsides, and forest edges. (Kling, 2022).

- **Hydrilla** or **Waterhyme** is a fast-growing submersed, rooted aquatic invasive plant that can grow in water up to 20 feet deep and can survive at depths of 40 feet, if the water is non-turbid. It forms dense mats at the surface of water, which can restrict native vegetation, irrigation practices, recreation, hydroelectric production and water flow. It can invade slow to still water systems. It is believed to be native to Asia or Africa and was first introduced into North America as an aquarium plant in the 1950s (Hydrilla, 2018).
- **Japanese Barberry** is an ornamental shrub first transported to the United States in 1875, historically used as a living fence for livestock and for herbal medicines. It is now used as an ornamental hedge plant and can be a nuisance as it harbors ticks that can cause Lyme's disease. Although invasive, it is still sold in nurseries and garden centers.
- **Poison Hemlock** is a tall poisonous invasive plant commonly mistaken for Queen Anne's Lace. It is an erect, bi-annual (meaning it takes two years to complete its life cycle and flower) that can grow six to ten feet high. It is toxic and can be fatal to humans and livestock if ingested, affecting the respiratory, central nervous, and reproductive systems. It can also cause skin rashes just by contact. Poison Hemlock is native to northern Europe, western Asia, and North Africa. It was introduced in North America in the 1800s as an ornamental and has spread throughout American, Canada, and Mexico. (Behnke, 2022).
- **Carolina Fanwort** is an herbaceous perennial aquatic plant that is an early identification species, just beginning to be a problem in Pennsylvania. It contains long branched stems with fibrous roots that fan like underwater leaves and can be submerged or floating. Native to South America, it was introduced as an aquarium plant. Once established, the dense growth of this plant can impede water flow and clog drainage canals and freshwater streams thus impacting recreation, agricultural and aesthetic uses. It can form dense stands, crowding out native species.
- **Japanese Angelica Tree** is another early identification species, just beginning to be a problem in Pennsylvania. This upright, deciduous shrub or tree can reach a height of 20-40 feet with a 15-30 ft in width. The stems are covered in spines, and in the fall the leaves turn yellow to reddish purple. It suckers from its base to spread and also spreads from the dispersal of its berries that are eaten and distributed by wildlife.

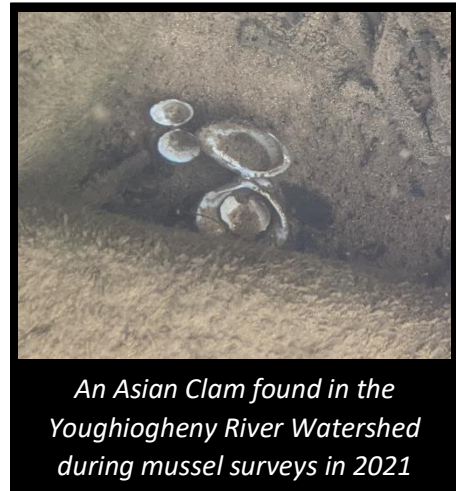
- **Sawtooth Oak** is an early identification species, just beginning to be a problem in Pennsylvania. It has been spotted in recent years to escape plantings and establish in nearby forests displacing native vegetation. It is native to Asia and has been widely planted in the United States as an ornamental and as food for wildlife. While it is no longer recommended for planting in the United States, it is still sold and many places debate listing it as an invasive species.
- **Wisteria** is an early identification species, just beginning to be a problem in Pennsylvania. Similar to Sawtooth Oak, many people do not see Wisteria as an invasive species, and it is still commonly sold at nurseries, garden centers, and online. Native to Asia, these plants were imported for landscaping uses. While some wisteria is native to the region, the non-native species have become more desirable for their colors.

Animals

Invasive invertebrates and vertebrates commonly disrupt food chains, outcompete native species, and interrupt other ecological processes. Invasive insects, with no effective natural predators, can decimate native vegetation. Many invasive insects have no effective defense against them. It is paramount to prevent the spread of invasive insects. Below is a list of common invasive species identified or speculated to be located within the Youghiogheny Headwaters.

- **Emerald Ash Borers** have already destroyed a significant population of ash trees and are expected to cause close to 100% mortality of ash trees in the United States. Because of the rapid spread and thriving population, the emerald ash borers have almost no effective controls.
- The **Hemlock Woolly Adelgid** is slowly killing the Eastern Hemlock, an important species for headwater health. The Hemlock-Northern Hardwood Forests are a key wildlife habitat. Maryland has over 42,000 acres of vulnerable hemlock forest at risk of infection by the hemlock woolly adelgid. The Maryland Department of Agriculture is working on a treatment and suppression plan.
- **Gypsy Moths** devour the leaves of oaks and other hardwood species, impacting several key wildlife habitats.
- **Spotted Lanternfly** has wreaked havoc in Pennsylvania and the majority of Maryland; however, it has not been identified in Garrett County as of March 2023. Somerset County was added to Pennsylvania's list of quarantine counties in March of 2023.

- **Virile Crayfish** are a great threat to native crayfish diversity in the Youghiogheny River. These crayfish have the capacity to displace native crayfish and alter aquatic food webs and habitats. In addition, these invasive crayfish are also found in West Virginia.
- **Rusty Crayfish**, like the virile crayfish, are a great threat to native crayfish diversity in the Youghiogheny River. These crayfish have the capacity to displace native crayfish and aquatic food webs. While they are found in Pennsylvania and West Virginia, they have not been identified in the Maryland portion of the Youghiogheny River, although they are found in other portions of Maryland.
- **Chestnut Blight** is a fungus that was accidentally introduced on nursery stocks imported from Asia. It was first discovered in 1904 and attacked the American Chestnut tree with detrimental impacts. It caused a fungal disease that virtually eliminated mature American Chestnut trees.
- **Asian Clam (*Corbicula fluminea*)**, has definitely been identified in the Youghiogheny River Watershed in Pennsylvania when Western Pennsylvania Conservancy and Mountain Watershed Association completed a mussel survey in 2021. This clam can alter the ecology of aquatic systems, making it less hospitable to native assemblage of freshwater mussels, fish, invertebrates and plants.



Conservation

Conservation Threats

- **Land Conversion/Habitat Loss and Fragmentation**
Habitats can change, and have over the years. One of the greatest historical changes occurred following the glaciers. While they never quite advanced to Maryland, they did impact lower portions of the Youghiogheny River Watershed in Pennsylvania. Habitats can change via natural circumstances such as storms, floods, and fires, or they can be a result of human activities, such as clearing lands for development or agriculture.

Since colonization nearly 400 years ago, the Northeast region of the United States continues to be one of the most densely populated regions in the country (Moore et. al, 1997). Housing and urban development have been identified as a top threat in every state in the northeastern United States.

Commercial and industrial developments contribute to the sprawl, especially in the Appalachian region with the expansion of wind turbines and communication towers that fragment forests habitats important to our native species. Even roads, railways contribute to the fragmentation of habitats, dividing once larger tracts of land into smaller parcels resulting in more edge habitats as opposed to interior habitats required for some species.

In the United States, the number one threat to biodiversity is habitat loss (Stein et al., 2000). Residential development expanding from cities to rural areas encroaches on the potential habitat for many species of plants and animals. The impacts are not limited to only terrestrial animals, plants, and habitats. Aquatic communities and organisms are also impacted by development leading to changes in water quality and even quantity. Water is a vital resource for life, along with development comes an increase of water consumption or use and then disposal post use can lead to contamination in the area's streams, lakes and rivers.

In order for optimal survival of all plant and animal species, terrestrial or aquatic efforts are needed to preserve continuous habitats when applicable. When continuous habitats cannot be preserved, establishing a corridor is essential so that plants and animals do not become isolated to small parcels. More research including assessments and surveys are needed so it can be documented and then properly incorporated and used in future planning efforts.

- **Agriculture and Aquaculture**

Large spans of open, cleared lands for agricultural production have an impact on the habitat and connectivity of some SGCN species that require large contiguous forest and grasslands. Aquaculture, including the rearing of trout and other fish species for stocking, may have an impact on native species and their habitats.

- **Energy Production and Mining**

Maryland produces over half of the energy it uses in-state from coal deposits and gas reserves in western Maryland, as well as hydroelectric potential in some rivers, solar energy and wind in the western mountain ridges, like those in the Casselman River Management Unit. In addition to the threats that these activities pose, their supporting infrastructure such as pipelines, access roads, etc. are also of concern. Some of these greatest concerns are the increases in fragmentation of forest lands and other habitats. Other concerns are the placement of large facilities for wind and solar being located in movement corridors for birds and bats, the displacement of feeding areas, and the degradation of the overall health of the habitat.

- **Transportation, Service Corridors, Culverts and Dams**

Transportation corridors provide a multitude of threats from fragmentation: increased predator access, physical barriers isolating populations, increased wildlife mortality via roadkill, easy pathways for the spread of invasive species, and noise disturbances leading to an overall decrease for quality of life.

Many invasive species have been introduced accidentally via packaging materials on shipments from other countries. Once these species are introduced, they are often hard to eradicate. See the section on invasive species for more information.

One impact of transportation, even at the local level that is often overlooked is road stream crossings. Depending on the type and placement of road culverts, if improperly placed, they can block upstream movement for aquatic organisms that rely on that for reproduction, such as trout. These conduits can also disrupt ecosystem processes such as hydrology, sediment and debris transportation.

Like culverts, dams also alter the flow patterns, transportation of sedimentation and limit the movement of aquatic organisms. Aquatic organisms, especially fish and mussels become isolated and cannot return upstream in order to reproduce. Unnecessary dams should be removed, and necessary dams should have some type of aquatic organism passage.

- **Impervious Surfaces and Riparian Buffers**

Impervious surfaces are surfaces that do not allow for the percolation of water into the subsurface. These include things such as paved roadways and parking lots. These surfaces can accelerate runoff; transport pollutants leading to an increase in peak flows that can lead to flooding; and channel erosion and water temperature changes, all of which can impact the quality and quantity of aquatic communities.

Transitional zones between terrestrial and aquatic habitats that provide a buffer, commonly known as riparian buffers provide many beneficial functions. Not only do these areas host a variety of rare and common species and communities, they help with nutrient exchange, modify hydrology, stabilization banks, and can even help with water temperatures in the case of forested buffers (Palone & Todd, 1997).

- **Harvesting Impacts**

- *Bycatch and accidental mortality*: These are plants and animals that were not the original target, but were accidentally collected and are

- often injured or killed during the collection process. This includes being trampled which is frequent for plants.
- Persecution against species: Many nuisance or pest species are also being eradicated from certain areas because they are unwanted by people whether they are captured and released in a different habitat or they are killed on site. In some instances, species are misidentified for something else; for example, many people think that water snakes are copperhead snakes, so they are killed. Just like wildlife, plant species are also in jeopardy for being falsely persecuted via misidentification.
 - Excessive harvesting: The overharvesting of a particular species includes fishing, hunting, and plant harvesting. This is very prevalent for desirable flowers, herbs, or medicinal plants, but the practice can be limited by placing harvest limitations, which has been done in Maryland for American Ginseng, that now requires a permit to harvest. The forest product industry also needs to be monitored to ensure they are following regulations and incentives like the Sustainable Forestry Act of 2009. This act encourages good practices through the use of incentives for harvesters. Although, with protections in place sometimes SGCN are impacted by fragmentation, invasive species.
- **Human Influences via Outdoor Recreation**

The outdoor recreation industry is a huge component to tourism and probably even more after the Coronavirus pandemic. However, certain activities can have drastic impacts to the plants and wildlife surrounding them. Below is a listing of some activities and their potential impacts.

 - Hunting and Fishing

Hunting and fishing draw in millions of people annually and are beneficial in helping maintain biological systems so that species do not become overpopulated for their available habitat. Of course, managing the harvest is essential so that species do not become overharvested. Sportsmen need to be careful that they do not transport invasive species from one location to another; this is particularly important for fishermen. They also need to watch where they step and to use designated paths to reduce the accidental trampling of potentially sensitive plant species and small animals, such as salamanders and frogs.
 - Motorized Recreation/Bicycling

Motorized recreational vehicle riding can upset or destroy natural lands and habitat for significant plant and animal species. They can increase erosion, provide easy transportation for invasive species disturbance, and can even cause mortality via accidental trampling.

Motorized and non-motorized riders need to stay on designated paths.

- Boating Activities
Boating in sensitive areas can impact bird nesting habitats or cause direct mortality of aquatic species. Boats that have not been thoroughly cleaned and/or dried between waterways have the potential to transport invasive species from one waterway to another.
 - Hiking/Wildlife Observation
Wildlife observation and hiking should be done in designated areas by staying on designated trails and paths. This will help reduce erosion in sensitive habitats, eliminate accidental trampling, and reduce the spread of invasive species.
- **Invasive Species** – See section on invasive species
 - **Climate change** – See previous section on climate change

Important Areas for Conservation: Natural Heritage Areas

Natural Heritage Areas (NHAs) are designated areas of ecological importance, including those relatively undisturbed by human activity, potential habitats for species of special concern, significant assemblages of plants and animals, and areas important for general wildlife habitat, scientific study, and recreation. NHAs can be identified according to the following classifications (Smith, 1998, and Wagner and Coxe, 2000):

- **Biological Diversity Area (BDA)** - An area that contains plants, animals, or natural communities of state or federal special concern, and/or high-quality examples of natural communities or exceptional native diversity.
- **Landscape Conservation Area (LCA)** - A large contiguous area is important because of its size, open space, habitats, and/or inclusion of one or more Biological Diversity Areas, and although including a variety of land uses, it has not been heavily disturbed and thus retains much of its natural character.

A Natural Heritage Inventory (NHI) was conducted in Somerset County in 2006 to catalog important biological resources and to identify and map the Natural Heritage Areas within each county. A total of 28 BDAs, 2 LCAs, and 5 NHAs have been identified in the Casselman River Watershed, Table 4-3. Descriptions for each NHA in the watershed can be found in Appendix J.

The information recorded in each NHI should be considered during planning processes to ensure the protection of these resources. One recommendation is that appropriate buffers be established around BDAs to protect wildlife, maintain hydrology, and prevent invasive species from entering the areas. Another

TABLE 4-3. NATURAL HERITAGE AREAS IN THE CASSELMAN RIVER WATERSHED

Site Name	Management Type	Significance
Christner Bog	BDA	Exceptional
Glade Mountain	LCA	Exceptional
Ilers Run	BDA	Exceptional
Kimberly Run Natural Area	BDA	Exceptional
Mount Davis	BDA	Exceptional
Negro Mountain, Casselman River Mine	BDA	Exceptional
Salisbury Mine Site	BDA	Exceptional
Sand Spring Ridge	BDA	Exceptional
Sand Spring Ridge	LCA	Exceptional
Youghiogheny River	BDA	Exceptional
Blue Lick Creek	BDA	High
Casselman Tributary Slopes	BDA	High
Garrett Mud Flats	BDA	High
High Point Lake	NHA	High
High Point Lake Road	BDA	High
Keystone Clay Mine	BDA	High
Lake Somerset	BDA	High
McClintock Run	BDA	High
Old Fish Hatchery Spring	BDA	High
Ringer Hill	BDA	High
Town Line Run Headwaters	BDA	High
Tub Mill Run	BDA	High
Upper Tub Mill Run	BDA	High
Wolf Rock Road	BDA	High
Allegheny Highlands Trail at Harnedsville	BDA	Notable
Allegheny Highlands Trail at Rockwood	BDA	Notable
Casselman River at Fort Hill	BDA	Notable
Flaugherty Creek	NHA	Notable
Mt Carmel Church	BDA	Notable
Murdock Quarry	BDA	Notable
South Glade Creek Wetlands	BDA	Notable
Tubs Run Wetland	BDA	Notable
Middle Youghiogheny River Gorge	NHA	
S Penn RR Tunnel - Berlin	NHA	County

implementation goal of this River Conservation Plan (RCP) is to work towards gaining “formal dedication” of additional NHAs and increase protection of ecological systems and biological diversity through the designation of Dedicated areas (DA), that could be secured through landowner agreements, special programs, or other methods.

Areas can gain formal dedication by becoming a PA DCNR- designated Natural Area. A Natural Area is an area of unique scenic, historic, geologic, or ecological value that will be maintained in a natural condition by allowing physical and biological processes to operate, usually without direct human intervention and with restricted use of the area (PA DCNR).

Important Bird Areas

The Important Bird Area (IBA) Program was established in the 1980s in Europe by Birdlife International. In the United States, the National Audubon Society became a partner organization and manages the program in 46 states including Maryland, Pennsylvania and West Virginia.

The goal of the program is threefold: identify, monitor, and conserve areas that are the most essential for sustaining native bird populations. Once identified sites are monitored for changes to habitat or species that reside or visit the area. Lastly, conservation efforts for long-term protection are prioritized to these sites. IBA sites are identified as essential habitats for one or more species of vulnerable bird populations including nesting areas, migration stops, and wintering grounds. Sites can be established on public and private lands, and just because a site is identified as an IBA, that does not mean the public has access to it. Sites are designated with bird and habitat protection in mind, not public access.

**TABLE 4-4. IMPORTANT BIRD AREAS IN CASSELMAN RIVER
MANAGEMENT UNIT**

IBA	Acres	Status	Priority
Winding Ridge Forest Block	65,810	Potential	State
Allegheny Front	497,189	Recognized	State
Lake Somerset	436	Recognized	State
Wolf Swamp	267	Recognized	State

Important Mammal Areas

In 2001, the Pennsylvania Game Commission initiated the Important Mammals Area Project to promote the conservation of mammals through the identification of critical habitats and to educate the public about the importance of mammals, modeling it after the Important Bird Areas project. The project was a joint venture among the Pennsylvania Game Commission, National Wildlife Federation, Pennsylvania Wildlife Federation, Federation of Sportsmen’s Clubs, Mammal

Technical Committee/Pennsylvania Biological Survey, and the Carnegie Museum of Natural History.

There are five categories from which sites must meet at least one of these criteria in order to be nominated. However, they can be nominated for more than one category.

- Habitats that support diverse or unique mammal communities by supporting significant populations of species or subspecies with specific habitat requirements or are representative of rare, threatened, or unique criteria.
- Habitats that support high density mammal populations with habitats that support significant aggregations of mammals during one or more seasons or support important core populations or population segments.
- Habitats that support species or subspecies listed as endangered or threatened by the Pennsylvania Biological Survey. The site supports a confirmed viable local population or species or subspecies that regularly occur at the site during one or more seasons.
- Habitats that support species or subspecies that are declining or vulnerable nationally, or listed as candidate species by the Pennsylvania Biological Survey (specifically candidate-proposed, candidate-at-risk, candidate-rare). Sites must sustain a confirmed viable local population or species or subspecies that regularly occur at the site during one or more seasons.
- Habitats that are important for wildlife viewing and public education. The sites include wild populations of mammals that can be viewed in their natural habitat or natural areas associated with an established educational program that interprets the natural history of resident mammals.

Two Important mammal areas have been identified within the Pennsylvania portion of the Casselman River Watershed – Kimberly Run and Forbes State Forests. Conservation authorities in Maryland should consider instituting a program similar to Pennsylvania’s for protecting habitat and sites where important mammals are known to reside.

- **Kimberly Run Natural Area #12**
 - The area encompasses 266 acres on private lands.
 - It has been identified because it sustains a confirmed viable local population of a species of greatest conservation need and the species as well as subspecies regularly occur at the site during one or more seasons.

- The site includes the Kimberly Run Natural Area which is owned by the Somerset County Conservancy. It is located at the junction of State Route 219 and the Pennsylvania Turnpike just east of State Game Lands 50. The site includes a 2.5-acre Sphagnum Bog, rocky stream-side habitats, fallow fields, and older growth hemlock and White Pine woodlands that have not been logged since the 1800s.
- Noteworthy mammals residing within this area include Fisher, Bobcat, Black Bear, and confirmed records of the West Virginia Water Shrew.
- The primary threat to the area is that of the aquatic habitat through water pollution caused by abandoned mine drainage (AMD).
- Recommendation: Conduct a survey for the presence of Water Shrews.
- **Forbes State Forest/Mt. Davis Section #14**
 - The area encompasses 581 acres of public lands.
 - It has been identified because it sustains a confirmed, viable local population of a species of greatest conservation need and the species as well as subspecies regularly occur at the site during one or more seasons.
 - The site includes Mt. Davis and an array of tributaries to the Casselman River that are dominated by deciduous forests, especially oak mixed with other hardwood species. Uncharacteristically, Pitch Pine and Mountain Ash trees are found within this area.
 - Noteworthy mammals residing within this area include the Allegheny Woodrat, Fishers and West Virginia Water Shrews.
 - This area allows for little human impact due to the higher elevations, but as elevation decreases, impacts to water quality are more likely from increased sedimentation and as higher water temperatures occur, they could be detrimental to water shrews.
 - Recommendation: Conduct Water Shrew surveys.

CULTURAL RESOURCES

Recreational Resources

Trails

Trails are an asset to a community whether designed for recreational purposes or as a connector to a neighboring community. Within the Youghiogheny River Headwater Management Unit, the majority of trails have been established for recreational purposes to allow visitors the opportunity to enjoy the natural surroundings of the region. Trail uses in the area vary among walking/hiking, mountain biking, cross-country skiing, equestrian use, and all-terrain vehicles or off-road vehicles. There are 19 trails or trail systems in the management unit, they are identified in Appendix K.

Parks

Parks are areas of land set aside for public use maintained for enjoyment and the recreational use of people (Landes, 2004). Parks can vary from small neighborhood parks to large state or federal parks. They can be publicly or privately owned and may vary between being free to having to pay an access or user's fee.

Within the Casselman River Watershed there is one State Park in Maryland and a State Forest in Pennsylvania. Other recreational facilities in the watershed include Casselman Valley Sportsmen Club, Grantsville Town Park, Spruce Forest Artisan Village, Addison National Road Community Park, Paul E. Faller Playground/Park, Maple Valley Park, Roadside Park, Garrett Community Park, Salisbury-Elk Lick Junior Senior High School, J.B. Schrock Community Park, Rockwood Community Park, Meyersdale Area High School, Confluence Borough Community Center, Elderly Housing Park, Somerset Area Junior Senior High School, Union Street Playground, Berlin-Brothers Valley Senior High School, Maple Ridge Elementary School, Rockwood Area High School, Turkeyfoot Valley Area Elementary School, Eagle View Elementary School, Confluence Ballfield, Trinity Park, and the Pleasant Valley Recreation Center.

- **State Forests**

Forbes State Forest is the only Pennsylvania State Forest in the Youghiogheny River Watershed; however, its territory extends beyond the Youghiogheny Watershed into that of the Conemaugh River. It is located in parts of Fayette, Somerset, and Westmoreland counties and spreads across the ridges of the Laurel Highlands region, encompassing over 60,000 acres. It is managed for pure water, recreation, scenic beauty, plant and animal habitat, sustainable timber and natural gas, and many other uses and values following the Forbes State Forest Resource Management Plan.

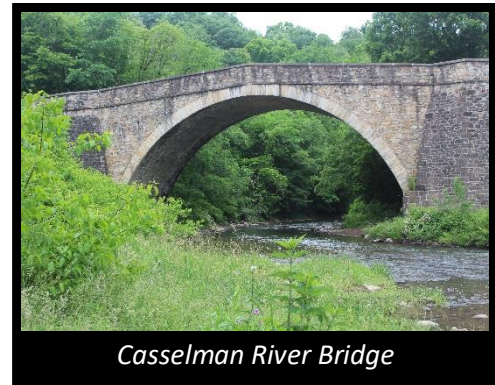
Forbes State Forests has over 360 miles of shared-use trails and forest roads including 11 miles of the Laurel Highlands Hiking Trail. There are also 115

miles of groomed snowmobile trails for use in the winter. In the state forest, recreational activities such as wildlife watching, sightseeing, hunting, fishing, mountain biking, cross-country skiing, snowshoeing, and horseback riding are permitted. Primitive camping is also permitted where posted. A permit is required if staying longer. In addition, there are six motorized sites available, but they require a permit which can be obtained at the district office in Laughlintown, PA, or online through the Pennsylvania State Park Reservation System.

Mt. Davis, the highest point in Pennsylvania, is located in the Forbes State Forest within the Casselman River Watershed. An observation tower offers a spectacular view of the Youghiogheny River Watershed.

- **State Parks**

Casselman River Bridge State Park is a 4-acre park in Grantsville, Maryland, that is popular for fly-fishing, picnicking, and photography. It is located on the site of where the 80-ft bridge was erected in 1813 to cross over the Casselman River. The bridge is no longer open to vehicular traffic, but visitors can walk across it to access the Spruce Forest Artisan Village.



When it was built, the Casselman River Bridge was the longest, single-span stone arch bridge in the United States and was an important link on the National Road from 1813 to 1933 (Maryland Department of Natural Resources).

Camping

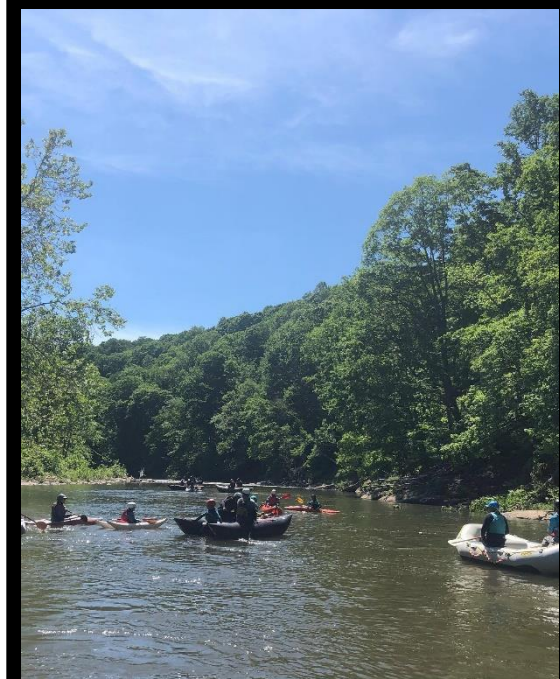
Camping is a popular recreational activity that increased in popularity due to the Coronavirus pandemic in 2020 to 2021. Within the Casselman River Watershed there are a variety of campgrounds plus one church camp. Information about amenities and programs for each camping opportunity is available on their websites. Camping opportunities in the Casselman River Management Unit are available in Appendix L. There are also a variety of cabin and Airbnb rentals available in the area.

Boating

The Casselman River Watershed offers many options for boating. Many sections of the main stem contain small rapids (Class I). Other sections require a higher level of skill and proper gear in order to handle the continuous gradient. From Markleton to Fort Hill, a paddler will enjoy scenic views and quality Class III rapids. Access points

along the river have been established, in part by the Casselman River Watershed Association and Pennsylvania Fish and Boat Commission (PFBC).

In total, there are more than 60 miles of continuous river miles with no dams. Confluence is located at the convergence of the Youghiogheny River, the Casselman River, and Laurel Hill Creek.



While it does not have the whitewater conditions of nearby Ohiopyle, the Casselman is another desired boating destination

The most popular stretch (Markleton to Fort Hill) is a favorite among boaters and often coupled with a biking shuttle along the Great Allegheny Passage Trail. PFBC regulates the launch in Markleton and a current launch permit is required at the parking lot on river left.

Several of the smaller tributaries are considered boatable after heavy rains or a spring melt. Whites Creek is a classic Class III stretch starting off Listonburg Road. The American Whitewater River website has information related to Casselman boating, including flows, directions to access points, and any important alerts.

Lake Somerset is a man-made reservoir where limited boating is available. The PFBC's website has current regulations. A valid launch permit is required at both launches at Lake Somerset.

Fishing

Fishing in Pennsylvania is regulated by the Pennsylvania Fish and Boat Commission (PFBC). They work to protect, conserve and enhance the aquatic resources and provide fishing and boating opportunities. In an effort to achieve their goal, they handle streams through various management designations and stream stockings.

In order to fish in Pennsylvania, all anglers ages 16 and up are required to purchase an annual fishing license, and if fishing on known trout streams a trout stamp also needs to be purchased. Resident and non-resident licenses are available to purchase at a variety of sporting goods stores and online through the PFBC website.

Regular trout-stocked waters are stocked and available for fishing from Opening Day of trout season through Labor Day. They include Casselman River (from PA-MD

state line to Coal Run); Cub Run (2.6 kilometers mouth to mouth); Elklick Creek (Cranberry Run to SR2004/T-510 intersection); Flaugherty Creek (West Meyersdale Railroad bridge 0.8 miles upstream T-712 to SR 2006 bridge/T-566 intersection); Glade Run (High Point Lake to mouth); Kimberly Run (362 meters upstream US 219 upper bridge to mouth); Little Piney Creek (Elklick Rod and Gun Club Dam to Piney Creek); McClintock Run (Glade Run to mouth); Middle Creek (SR 3029 bridge to mouth); Miller Run (Headwaters to mouth); Piney Creek (third PA-MD state line crossing to Greenville Road bridge and 0.8 miles upstream Engles Mill Road bridge to mouth); Piney Run (T-816 bridge to mouth); Tub Mill Run (LR 55047 bridge Compton to mouth); Whites Creek (first Whites Creek Road bridge upstream Enos Run to mouth)

There are three Class A Streams in the Casselman River Watershed. Class A streams are waterways with populations of naturally reproducing trout of sufficient size and abundance to support a long-term and rewarding sport fishery. Enos Run supports 2.8 miles, Isers Run supports 3.0 miles, and Zehnrer Run supports 1.15 miles. In addition, Isers Run also has 5.84 miles of stream that are designated as Wild Trout Streams. Streams with this designation contain surface waters that the Pennsylvania Fish and Boat Commission protect and promote as native trout fisheries that maintain and enhance wilderness aesthetics and ecological requirements necessary for the natural reproduction of trout.

Lake Somerset – is a Brood Stock Lake/Catch and Release Lake. Fishing is permitted but all fish have to be released.

Hunting

- **Pennsylvania**

The Casselman River Watershed is located within the 2C Wildlife Management Unit for hunting as designated by the Pennsylvania Game Commission. Wildlife management units are delineated based on habitat and human-related characteristics, such as population density, public vs private land ownership, recognizable features consisting of roads and streams, as well as land use practices like agriculture, timbering, and development. They are used to manage all game with the exception of Elk, waterfowl, and migratory game birds. Hunting is permitted on public and private lands during the appropriate hunting seasons. Information about hunting seasons in Pennsylvania is available on the Pennsylvania Game Commission website. However, prior to hunting on private property, landowner's permission should be obtained even if hunting in forest game and hunter access properties.

State Game Lands (SGL) are lands purchased and managed by the Pennsylvania Game Commission to provide habitat for wildlife, increasing opportunities for lawful hunting and trapping. These lands are open to the

public. There are portions of four State Game Lands within the Middle Youghiogheny Watershed, they include: SGL 50, 82, 231, and 271.

The entire Forbes State Forest is open to hunting with the exception of the Natural Areas and public picnic areas.

- **Maryland**

In Maryland, licensed permit holders are permitted to hunt all legal, in-season birds and mammals. Licenses are valid from August 1 through July 31 of the next year. Some species, such as deer, migratory game birds, furbearers, and bears require additional permits or stamps in order to hunt. Licenses are made available to both residents and nonresidents of Maryland and costs vary. In order to obtain a hunting license, hunters must take and pass an educational safety course unless they can document proof of hunting prior to 1977.

Public lands within the Casselman River Watershed open to hunting include Cunningham Swamp Wildlife Management Unit. It is a 328-acre tract that encompasses the majority of the Cunningham Swamp. It is a rich wetland with exceptional habitat for wetland and bog-related species. There are open fields and upland forest habitats as well. A variety of species from Ruffed Grouse to the American Woodcock to Black Bears, White-Tailed Deer, Wood Ducks, Canada Geese, and Beavers reside there. The area is open to hunting according to open seasons and proper licenses.

Golfing

The Casselman River Watershed contains two golf courses: Middle Creek Golf Course and Somerset Country Club. Middle Creek Golf Course is a 9-hole course. The Somerset Country Club provides an 18-hole course with a ProShop for purchasing golfing attire and club fitting needs.

Environmental Education

The Youghiogheny River has unique opportunities for environmental education that should be utilized to their fullest extent. The Youghiogheny holds educational opportunities for people of all ages. It could be utilized as an outdoor environmental classroom or become a topic for an essay contest for school children. It could be a research experience for adolescents through adults or a history lesson detailing the past events that helped shape the nation. There are many other opportunities for children, adults and seniors to continue their education. Including subjects about history, science, math, English, biology, hobbies, and environmental stewardship. The



Golfers having a little bit of fun before teeing off at Mountain Watershed Association's Golf Scramble Fundraiser at Middle Creek Golf Course in 2021.

Youghiogheny Valley was filled with a vast quantity of historic, cultural and environmental resources that have just begun to be rediscovered.

Expanding and supporting existing environmental education in this area would be beneficial to individuals as well as the community at large in fostering a better understanding of the importance of conservation and stewardship. Environmental education also exposes individuals to possible careers in these fields as well as empowers them to be better advocates for environmental justice.

A variety of organizations provide environmental education opportunities to landowners, students, and visitors in and around the Indian Creek Watershed. Environmental education programs are also offered at our neighboring state parks, and Forbes State Forest. These programs are geared towards providing hands-on, in-field learning experiences and getting people outside away from the electronic devices that control their lives.

Mountain Watershed Association

Mountain Watershed Association (MWA) is a non-profit, 501©3 organization with the mission to protect, preserve and restore the Youghiogheny River Watershed and its broader communities through conservation, recreation, education and advocacy. Yearly, MWA works with over 3,000 learners over the course of about 50 environmental education events. MWA hosts their own educational events and also visits schools, community centers, scout groups, libraries, and more to teach their watershed education curriculum.

Outdoor Lending Library

Upon receiving a grant from the Fayette County Community Foundation, with materials supplemented by the Grable Foundation and the DEP education grants, MWA has created a library of outdoor gear and educational resources available to the public! This comprehensive and inclusive resource library is located in MWA's office, and items will be available to be checked out during our office hours.

Water Guardians After-School Club

Water Guardians is an after-school education program developed with a generous grant from the Pennsylvania DEP. Water Guardian club meetings provide students with a plethora of opportunities to gain experience through ecology-based activities. Their main goal is to have fun and spark a connection between students and their local environment.

Family Field Day at Laurel Hill State Park

Together with the State Park Rangers at Laurel Hill State Park, Mountain Watershed Association held its first annual Family Field Day in June 2023. Using funds from the DEP's generous education grant, we provided local families with a fun day of outdoor learning and recreation on the shores of Laurel Hill Lake.

Indian Creek Watershed Fishing Festival

This fishing derby and clinic has been hosted annually at CW Resh Park in Indian Head, PA for 15 years. Families came from near and far to enjoy a day of free activities along Indian Creek. The event features free fishing and lunch for kids 12 and under, hands-on environmental education activities, door prizes, a fly-casting clinic with PA Fly Co, and goods from local vendors. The event wraps up with the highly anticipated Indian Creek Duck Race, in which the MWA team released 1000 rubber ducks into the creek.



A Trout Unlimited volunteer working with a youth participant on fly casting

Fly-Fishing Clinics – 6 per year

In 2022, MWA started hosting free fishing and fly-tying clinics in partnerships with local Trout Unlimited chapters and PA Fly Co, a local fly-fishing business.

Professional Development Trainings – 4 per year

Growing up WILD **Growing Up WILD** is an early childhood education curriculum that builds on children's sense of wonder about nature and invites them to explore wildlife and the world around them. Through a wide range of activities and experiences, Growing Up WILD provides an early foundation for developing positive impressions about the natural world and lifelong social and academic skills.

Project WILD's mission is to provide wildlife-based conservation and environmental education that fosters responsible actions toward wildlife and related natural resources.

Population Education is all about people – how many of us there are, how we shape the world, and how we interact with each other. And as the go-to program providing innovative lesson plans and professional development on human population growth and its effects, Population Education supports K-12 teachers across content areas. Our human population has grown from 1 billion to 8 billion in just over 200 years and is expected to grow through this century, so it is critical to examine human impacts on wildlife, climate and natural resources, while working toward equality and justice for the world's people.

County Conservation Districts

County Conservation Districts (CCD) provide a diversity of programs and services to their constituents that include: abandoned mines, agricultural land preservation,

erosion and sedimentation control, floodplain management, forest management, nutrient management program, stormwater management plans, waterway and wildlife management protection, dirt and gravel and low volume road programs as well as environmental education. They accomplish this hosting events and environmental educational programs in addition to sponsoring county Envirothon competitions.

Envirothon

Each CCD works with teachers and professionals throughout Pennsylvania to host an Envirothon competition. High school students are guided through this natural resource environmental education program that combines classroom learning and outdoor activities. This exposure to nature and seeing how humans impact the natural world provide invaluable lessons for understanding ecosystems and our environment.

At the Envirothon, teams of five high school students compete in field testing using their knowledge in five topic areas – Soils and Land Use, Aquatic Ecology, Forestry, Wildlife, and Environmental Issues. A current environmental issue is chosen each year as the “hot topic” for the focus of this station as well as the oral presentation component. The winners of each county competition, then compete for the state title with that winner representing Pennsylvania at the national Envirothon competition.

Penn State Extension

It is the belief of Penn State Extension to deliver science-based information to people, businesses and communities. They do this through a variety of programs and educational sessions. Each county has an Extension office and the programs available between counties. Some of the more notable programs include: 4-H, master gardener, master watershed, and master well steward programs.

Historical Resources

Watershed History

Little is known about the people of the Youghiogheny Watershed before the arrival of Europeans. It is believed that a clan known as the Monongahela lived in the area approximately from A.D 900 to 1600. They were nomadic gatherer-hunters residing in temporary or semi-permanent camps. Their lives were very much tied to the seasons. Most of their efforts in the spring through the early autumn would have been growing crops. Everyone participated in the planting and harvesting, but women, children, and older adults were responsible for tending the crops during the growing season. Men were responsible for most of the hunting. However, the cooperation of everyone was needed for processing. Men and women butchered the animals; women were responsible for preserving them.

The Monongahela lived in round, dome-shaped houses 9 ft to 30 ft in diameter. These dome houses were made by cutting down small trees and pushing the cut end into the ground in a circle formation. The tops of the trees were then bent together and tied to make a frame. Poles were then bent around the outside of the frame to make the house more stable. Finally, large pieces of bark were cut and placed over the frame. A hole was left at the top of the roof to allow smoke from the campfire to escape out of the house. During the summer, cattails covered the houses and kept the rain from dripping inside, yet allowing air to circulate. The inside of the house was simplistic. The walls were lined with sleeping benches constructed from sticks and lined with animal skins or plant mats.

The houses were arranged in large circles to form a village. The center of the village was left open for group or ceremonial activities. A large fence, a stockade, surrounded some villages to help protect against raids from unfriendly groups. They had storage rooms attached to their houses, like a kitchen pantry, where they stored dried and preserved foods. Sometimes the storage rooms were used for cooking.

They did not have a complex government. Instead, they had what is referred to as an egalitarian society, where everyone had a say in how the village was run. This is believed because most houses within the village were similar in size; most homes had their own food storage; and there were no apparent differences in how people were buried. Each house controlled its resources, though cooperation between families was necessary for the good of the village.

Historically, known Native trails in the Meyersdale, Pennsylvania area may have been used by the Monongahela for trading with outside groups, such as the Turkeyfoot Path (Figure 4-2). These trails were probably the same ones used for hundreds of years by prehistoric Native groups. Trade evidence is apparent from stone flakes and tools made from rocks from faraway parts of the country.

The Monongahela mysteriously disappeared from the area 400 to 1,000 years ago. Following the Monongahela People, the Shawnee, Seneca, and Delaware tribes utilized the area as a hunting ground but not a permanent home. The name Ohiopyle comes from the Lenape, members of the Delaware nation. Their name for the area was “ahi opihøle,” which means “white frothy water,” referring to the falls and the whitewater in the area.



Figure 4-2:
Monongahela
Villages' locations
and trading paths in
Somerset County of
the Youghiogheny
Watershed. Image
taken from
<http://www.phmc.state.pa.us/portal/communities/archaeology/files/mysteryofmonindians.pdf>

The earliest reference to the Youghiogheny River is a caption on a map drawn in 1737 by William Mayo: Spring heads of Yok-yo-gane river, a south branch of the Monongahela. The name originated from one of the dialects from the Lenape and means "a stream flowing in a contrary direction" because it flows north for sixty miles, then north and west. Other variations of the name include Joxhio Geni, Yoxhio Geni, Yayughagany, Youghiogheni, Yehiogany, Yoxhiogany, Yohogania, Yochi Geni, Youghanne, and Yuh-wiac-hanne.

Since the Youghiogheny connected to the broad and boatable Ohio River, these rivers opened access to the entire western frontier. For this reason, Ohio became the target of colonial explorers, traders, armies, and settlers in the 1700s. The basin was strategic, the height of land between the Potomac Valley and the Ohio Valley. Trails from Virginia were among the first routes leading to the interior, and they crossed the Youghiogheny.

Ownership of the Youghiogheny lands was under debate in the 1700s. The Iroquois claimed the land after they spent twenty years fighting other Native Nations for it. The French thought the land was theirs; they dated their claim from 1682 when La Salle canoed the Mississippi and declared that France owned the entire basin. The British believed it should belong to them because they intended to settle the land. They also claimed the land through a 1744 treaty with the Iroquois. In 1753, George

Washington made his first appearance in the area at 21 years old to carry a message from the Governor of Virginia to the French at Fort LeBoeuf to tell them to stop the occupation of lands claimed by the English.

Historical Sites

The National Register of Historic Places was established by the National Historic Preservation Act of 1966. The National Parks Service maintains the list nationally; in Pennsylvania it is administered by the Pennsylvania State Historic Preservation Office within the Pennsylvania Historic Museum Commission, and in Maryland it is the Maryland Historic Trust.

For consideration, or placement on the National Register, a landowner applies to the State Historic Preservation Office. The first step is the completion of a Historic Resource Survey. This provides a historical description of the buildings, sites, structure, object, or district that the landowner would like placed on the National Register. The state office reviews the forms and, if needed, reaches out to the landowner for additional information to determine if it meets eligibility guidelines. If not, the landowner is provided appeal information. If a property does meet the initial eligibility, it is then nominated to the State Historic Preservation Board. If the Board approves the nomination, it recommends placement to the National Parks Service. Again, if it is denied by the Historic Preservation Board, the landowner is given information about how to appeal.



The Casselman Hotel historical site remains a vibrant part of the community as depicted in this 2022 photograph.

Within the Casselman River Watershed 14 sites have been listed on the National Register.

- **Casselman's Bridge National Road**
Listed Reason: Transportation, Communication
Listed Date: 10/15/1966
Listed Category: Structure
- **Casselman Hotel (Dorsey's Hotel)**
Listed Reason: Inns of the National Road
Listed Date: 12/22/1976
Listed Category: Building

- **Fuller-Baker Log House**
Listed Reason: Transportation, Architecture
Listed Date: 12/12/1971
Listed Category: Building

- **Stanton's Mill**
Listed Reason: Industry, Architecture
Listed Date: 1/17/1983
Listed Category: District

- **Tomlinson Inn and the Little Meadows (Stone House/Braddock's Fourth Camp)**
Listed Reason: Military, Transportation
Listed Date: 9/20/1973
Listed Category: District

- **Bollman, W. and Company Bridge**
Listed Reason: Transportation
Listed Date: 11/8/1978
Listed Category: Structure

- **New Colonial Hotel (Stagecoach Inn, Sechler Sports Distribution, Historical Colonial Hotel)**
Listed Reason: Architecture, Commerce, Entertainment/Recreation
Listed Date: 5/10/2005
Listed Category: Building

- **Second National Bank of Meyersdale (Gallentine National Bank, Meyersdale Borough Building)**
Listed Reason: Commerce, Architecture
Listed Date: 2/20/2002
Listed Category: Building

- **Wolf, Penrose Building (Rockwood Opera House)**
Listed Reason: Commerce, Entertainment/Recreation, Architecture
Listed Date: 9/13/2002
Listed Category: Building

- **Somerset County Courthouse**
Listed Reason: Architecture
Listed Date: 6/27/1980
Listed Category: Building

- **Uptowns Somerset Historic District**
Listed Reason: Commerce, Political Government, Architecture
Listed Date: 11/7/1995
Listed Category: District

- **Uptown Somerset Historic District (Boundary Increase)**
Listed Reason: Commerce, Architecture
Listed Date: 3/28/1997
Listed Category: District

- **Daniel B. Zimmerman Mansion (Georgian Place)**
Listed Reason: Architecture
Listed Date: 2/24/1995
Listed Category: Building

- **Penn Alps, Main Building**
Listed Reason: Inns of the National Road
Listed Date: 12/22/1976
Listed Category: Building