

Punch Brook-Roeliff Jansen Kill Watershed Characterization Report



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Hudson River
Watershed Alliance



Acknowledgements

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Cover photo: The Punch Brook-Roeliff Jansen Kill watershed, as seen from Drowned Lands Swamp Conservation Area. Photo by Emily Vail, 2023.

It is with gratitude and humility that we acknowledge that the Punch Brook-Roeliff Jansen Kill watershed is part of the ancestral homelands of the Mohican people, who are the indigenous peoples of this land. Despite tremendous hardship in being forced from here, today their community resides in Wisconsin and is known as the Stockbridge-Munsee Community. We pay honor and respect to their ancestors past and present as we commit to building a more inclusive and equitable space for all.



The Hudson River Watershed Alliance unites and empowers communities to protect our shared waters. We work across the Hudson River watershed to support watershed groups, help communities work together on water issues, and communicate as a collective voice.

This project was supported by funding from the Hudson River Estuary Program, New York State Department of Environmental Conservation, with support from the New York State Environmental Protection Fund, in cooperation with NEIWPC.



Department of
Environmental
Conservation

Hudson River
Estuary Program



Executive Summary

The Punch Brook-Roeliff Jansen Kill watershed includes 47.5 square miles of lands and waters, and is the largest of six subwatersheds within the Roeliff Jansen Kill watershed. It includes significant parts of the Towns of Ancram (about 70 percent of the town) and Gallatin (about 30 percent of the town), with smaller portions of the Towns of Copake, Taghkanic, Pine Plains, and North East. The watershed is bordered by the Taconic Mountains to the east and situated within the rolling hills of southern Columbia County and northern Dutchess County. The Punch Brook-Roeliff Jansen Kill watershed is located at the midpoint of the Roeliff Jansen Kill, which extends from Hillsdale to Germantown.

The largely rural Punch Brook-Roeliff Jansen Kill watershed includes a mix of land uses, including agriculture, residential, and industry, along with regionally significant fish and wildlife habitats. More than 60% of the land area is either forested or wetlands, providing diverse and unique habitat for a variety of wildlife, including rare species. Large, high quality forests in the northwest part of the watershed are part of a regional wildlife corridor that connects the Taconics and the Hudson Highlands. The Drowned Lands Swamp along the Punch Brook is an especially unique wetland habitat, and a public conservation area provides important recreational access. Another 30% of the watershed is pasture or cropland; agriculture and agro-forestry are important land uses that contribute to the local economy and traditional way of life. The stream network supports habitat for coldwater fish and migratory American eel, as well as rare aquatic species.

Though most of the watershed has low density development, the Roeliff Jansen Kill does pass through several more densely developed hamlets. A large paper mill is located on the banks of the Roeliff Jansen Kill in Ancram; other industrial land uses include petroleum bulk storage facilities and a transfer station. Scattered development in the watershed results in many roads that cross streams, which can constrict flood flows and be a barrier for fish and other aquatic animals. Several communities (Ancram, Copake) have replaced undersized culverts to support fish passage and reduce the risk of flooding. Increasing development is a challenge across the watershed. Most of the watershed relies on septic systems, which can fail and cause water quality issues. However, water quality is good in the Roeliff Jansen Kill within the watershed, especially compared with other rivers and streams in the Hudson Valley. Water quality monitoring is important in healthy watersheds to ensure that high water quality continues.

The land adjacent to Punch Brook and Roeliff Jansen Kill is mostly private property, largely hidden from public view, except for bridges and a few publicly accessible sites. However, actions taken on the land can affect watershed neighbors across six communities. The lands and waters of the Punch Brook and Roeliff Jansen Kill connect people both upstream and downstream across this rural region.

This watershed characterization report compiles information about the watershed from a wide range of sources to set the foundation for local decision-making and future planning.

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Introduction and Project Background

This characterization report for the Punch Brook-Roeliff Jansen Kill watershed was created to help the communities that are part of this watershed understand the current conditions of their shared land and water resources. It compiles existing information in one place, describing and illustrating the physical characteristics, lands, waters, and people of the Punch Brook-Roeliff Jansen Kill watershed.

The report tells the story of the watershed, including what is known and where there may be gaps in available information. It provides a foundation for watershed planning and can serve as a resource for partners to build local interest in the watershed and support for future watershed management.

Watershed Characterization and Planning

Watersheds are made up of all of the lands and waters that flow to a specific body of water. Watersheds are broadly defined by topography and the lay of the land (Figure 1). Precipitation, surface water, and groundwater within a watershed all flow to a common waterbody. Water infrastructure and past development can change the way water flows across the landscape, which can complicate watershed boundaries at a more local scale.

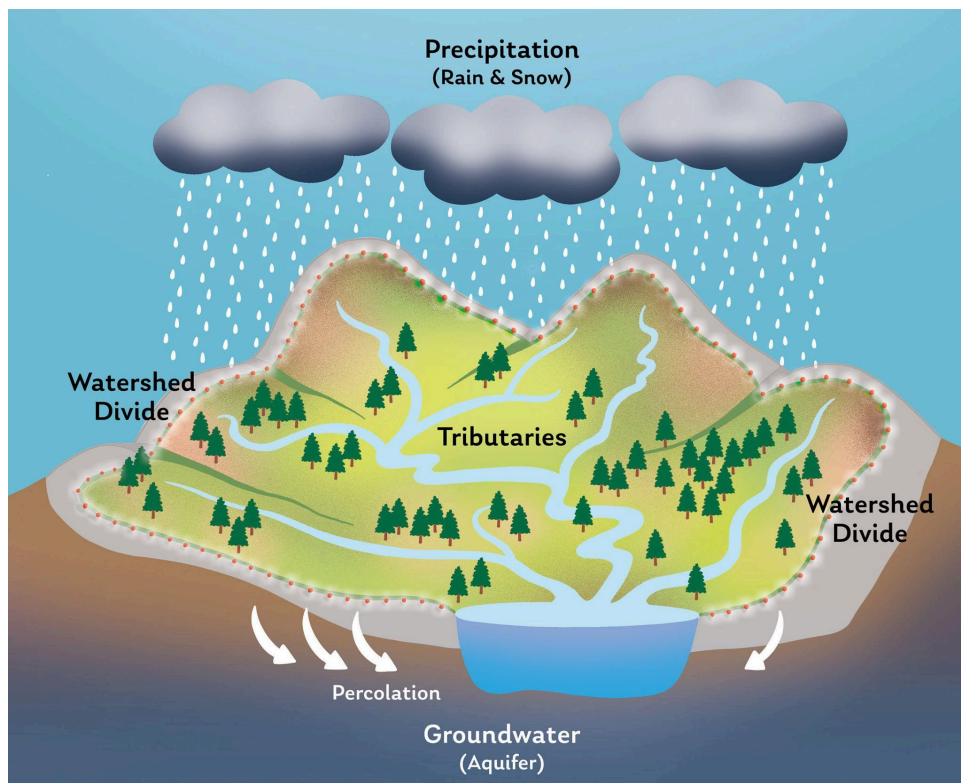


Figure 1. Depiction of a watershed, the lands and waters that flow to a specific body of water. (Hudson River Watershed Alliance)

Watersheds can be large or small. The whole Hudson River watershed is about 13,400 square miles, extending from the Adirondacks to New York City. Many smaller rivers and streams flow into the Hudson River along the way, and each of these tributaries has its own watershed that affects the health of the larger watershed ecosystem.

Watersheds are the geographic unit best-suited to understanding conditions and managing our waters. Many natural resource plans are based on political boundaries, including municipal, county, or state lines. Because water doesn't follow those boundaries, using watersheds allows for a more holistic approach, considering problems and potential solutions up and downstream. It is an opportunity to consider the intersections of environmental and social dynamics and their impacts on water quality, availability, and access. Working across boundaries for collective benefit requires building partnerships across municipalities. It takes time to build new relationships. However, because water issues may require solutions in neighboring communities, taking that time will be better for the water resources and the people who depend on them. Plans developed at the watershed scale are more successful at addressing water quality problems and helping to prevent future problems because they involve stakeholders in both upstream and downstream communities throughout the watershed.

A watershed plan is a non-regulatory document that identifies current or potential issues within a watershed, proposes solutions, and creates a strategy for putting those solutions into action. While many watershed plans in the past have focused specifically on point or nonpoint sources of pollution, watershed plans may also include other issues considered at a watershed scale, such as flooding, climate resilience, terrestrial and aquatic habitats, water quality, recreation, and other priorities for the watershed communities.

Understanding the watershed through a watershed characterization is the first step in a watershed planning process. A watershed characterization compiles existing information together into one report, with maps, charts, and narrative to describe current watershed conditions. As watershed management can be complex and multidisciplinary, the watershed characterization report supports the understanding of local conditions by bringing together information from a wide range of sources for decision-making and actions.

A watershed plan builds on the foundation of the watershed characterization report. The planning process brings together a broad set of stakeholders from across the watershed to identify shared goals. Using the present-day conditions documented within the watershed characterization as a starting point, and the goals and objectives for the watershed in the future, stakeholders work together through the planning process to prioritize specific, strategic actions to improve their watershed's health. A watershed plan outlines actionable steps that can be taken within a watershed to address identified challenges.

Punch Brook-Roeliff Jansen Kill Watershed Characterization Process

In June 2022, the Hudson River Watershed Alliance solicited applications to provide technical assistance to develop a watershed characterization, adapting the process outlined in the NYS

Department of State and Department of Environmental Conservation [Guidebook on Watershed Plans](#). This technical assistance was provided through funding from the Hudson River Estuary Program, New York State Department of Environmental Conservation, with support from the New York State Environmental Protection Fund, in cooperation with NEIWPC.

The Town of Ancram Conservation Advisory Council applied for assistance to create a watershed characterization for a portion of the Roeliff-Jansen Kill watershed that includes the Punch Brook, a stream that flows into the Roeliff-Jansen Kill. The Punch Brook-Roeliff Jansen Kill watershed includes 47.5 square miles of lands and waters within the larger 230 square mile Roeliff Jansen Kill watershed. Communities within the Punch Brook-Roeliff Jansen Kill watershed include the Towns of Ancram, Gallatin, Copake, and Taghkanic in Columbia County, and the Towns of North East and Pine Plains in Dutchess County.

Advisory Committee members included representatives from the municipalities within the Punch Brook-Roeliff Jansen Kill watershed, along with the Roe Jan Watershed Community, Columbia Land Conservancy, and New York State Department of Environmental Conservation (NYS DEC) Hudson River Estuary Program. A full list of Advisory Committee members is available in the [Acknowledgements](#) section. The project kicked off with an Advisory Committee meeting on September 30, 2022. Additional Advisory Committee meetings were held on November 28, 2022; March 13, 2023; October 25, 2023; and February 27, 2024 to provide feedback on the project process and products.

Punch Brook-Roeliff Jansen Kill Watershed Characterization Project Goals and Context

In their application, the Town of Ancram identified both watershed-wide and municipal goals for this project. A rural watershed, the Punch Brook-Roeliff Jansen Kill watershed includes a mix of land uses, including large areas of forest, farmland, and wetlands. Initial priority issues identified by the Advisory Committee included the increased development of agricultural lands, aging septic systems, bulk storage facilities, maintaining healthy stream buffers, the impacts of dams, and protecting water quality. At a municipal level, the Town of Ancram also intended to use the watershed characterization to support flood planning and augment their Climate Smart Communities efforts.

The watershed characterization of the Punch Brook-Roeliff Jansen Kill subwatershed is an important first step to achieve the future goal of a watershed plan for the entire Roeliff Jansen Kill watershed (known locally as the Roe Jan). The Punch Brook-Roeliff Jansen Kill subwatershed is the largest subwatershed and is centrally located within the larger Roeliff Jansen Kill watershed. It also includes land uses that are typical of the larger Roeliff Jansen Kill watershed.

This project built on prior plans and inventories of natural resources, stream connectivity, and resiliency within the watershed, and helped identify data gaps that could be addressed in the future. The intended audience for the characterization report included planning entities, first responders, land conservancies, private landowners, and recreational users, with the goal of

making aggregated information about the Punch Brook-Roeliff Jansen Kill watershed more broadly available.

At the project kick off meeting, Advisory Committee members' highest priority for the project was to provide context for watershed planning as a next step, compiling all available information into one place. A secondary goal was to educate partners and community members on watershed conditions and communicate that information in an effective way. They also expressed the need to connect and collaborate with both upstream and downstream communities for watershed planning and management.

How to Use this Watershed Characterization Report

The *Punch Brook-Roeliff Jansen Kill Watershed Characterization Report* is organized into four sections:

1. [Watershed Physical Characteristics](#) - This section provides the foundation for the report. It includes the watershed delineation, regional context, and physical characteristics like geology and climate.
2. [Lands of the Watershed](#) - This section focuses on land use, land cover, forests, wetlands, terrestrial habitats, and the built environment, all of which influence the watershed in a variety of ways.
3. [Waters of the Watershed](#) - This section focuses on the waterbodies and watercourses within the watershed, including floodplains and riparian areas, aquatic habitats, water quality, and water infrastructure.
4. [People of the Watershed](#) - This section focuses on the people living in and caring for the watershed.

The watershed characterization report is a non-regulatory summary of current watershed conditions that is intended to be a source of information for a variety of audiences.. Some water resources identified in this document are protected by state or federal programs. The report and maps should not be used for jurisdictional or regulatory purposes. We recommend working with NYS DEC's Region 4 Office in Schenectady and other appropriate agencies on issues involving regulated resources.

Some of these datasets included in the report are available to view on online mapping applications, which allows for interactive viewing of mapped features, more information about individual features (i.e., attribute information), and links to more information. In particular, the [Hudson Valley Natural Resource Mapper](#), the [DECinfo Locator](#), and the [NYS DEC Environmental Resource Mapper](#) show a number of valuable datasets that are included in this report. Other online mapping applications are referenced in the relevant sections of the report. Information within this report was compiled between December 2022 and March 2024, and newer information may be available through online mapping applications.

Watershed Characterization Quality Assurance Project Plan Process

This project compiled and summarized secondary data from within the focus watershed and informs a current understanding of that watershed's conditions. This work was guided by a secondary data Quality Assurance Project Plan (QAPP), which was reviewed and approved by NEIWPC staff. The Hudson River Watershed Alliance reviewed and documented all information used for this report. All secondary data sources included within the report provided sufficient information on methodology and sources of information. Any limitations in data quality are fully disclosed. The most current available data were used, unless past data provided a valuable baseline or other context to show trends and changes over time. For more details, please see the [Watershed Characterization Secondary Data Quality Assurance Project Plan \(QAPP\)](#).

Information for this project was compiled between December 2022 and March 2024. This included [60 data sources for the report](#) and [49 data sources for the maps and GIS-based summary statistics](#). All data were collected, reviewed, and assessed for use within the Watershed Characterization Report, according to the criteria documented in the QAPP. Data were collected from many sources, including local information submitted by the Watershed Characterization Advisory Committee. All sources of data were documented utilizing a tracking spreadsheet format to determine if each met criteria for inclusion in the watershed characterization report.

Data Limitations

This report contains information available at the time of writing, with data sources cited, but many more datasets may exist and new information is always being collected. Datasets contained here could have inaccuracies and/or could change in important ways in the future. This report is limited to existing information and, therefore, is not a substitute for on-the-ground surveys and assessments. It is not intended to be used for site-level planning. Information provided should be verified for legal purposes, including environmental review.

Geographic information systems (GIS) data originate from many different sources, produced at different times and for different purposes. They are often collected or developed from remote-sensed information (i.e., aerial photographs, satellite imagery) or derived from paper maps. For these reasons, GIS data can contain all the inaccuracies of the original data in addition to any errors from converting it to digital GIS information. Therefore, maps created with GIS data are not a substitute for surveys and direct knowledge. However, they provide a starting point for understanding available information, any gaps, and a summary of current watershed conditions.

Watershed Physical Characteristics

This section provides the foundation for the watershed characterization report. It includes the watershed delineation, regional context, and physical characteristics like geology and climate.

Watersheds and Waterbodies

The Punch Brook-Roeliff Jansen Kill watershed includes 47.5 square miles of lands and waters (Figure 2). It is the largest of six subwatersheds within the Roeliff Jansen Kill watershed (Figure 4, Table 2). The Roeliff Jansen Kill watershed (known locally as the Roe Jan) covers 230 square miles and extends from Hillsdale to Germantown, where the Kill flows into the Hudson River (Figure 4).

The Punch Brook-Roeliff Jansen Kill watershed includes 277 acres of waterbodies and 111 miles of streams. In addition to the Punch Brook and Roeliff Jansen Kill, other major waterbodies within the watershed include Upper Rhoda Pond, Lower Rhoda Pond, Long Pond, Miller Pond, and Dewitt Pond.

Municipalities

The Punch Brook-Roeliff Jansen Kill watershed includes parts of six municipalities. Municipalities in the Punch Brook-Roeliff Jansen Kill watershed include the Towns of Ancram, Gallatin, Copake, and Taghkanic in Columbia County and small portions of the Towns of North East and Pine Plains in Dutchess County (Table 1). Lands within the Towns of Ancram and Gallatin make up most of the watershed area.

Table 1. Portion of municipalities in Punch Brook-Roeliff Jansen Kill watershed.

Municipality (County)	Percent of Municipality within the Punch Brook-Roeliff Jansen Kill Watershed
Town of Ancram (Columbia County)	71.2%
Town of Gallatin (Columbia County)	28.6%
Town of Copake (Columbia County)	6.7%
Town of Pine Plains (Dutchess County)	6.5%
Town of Taghkanic (Columbia County)	2.2%
Town of North East (Dutchess County)	0.7%

PUNCH BROOK-ROELIFF JANSEN KILL WATERSHED

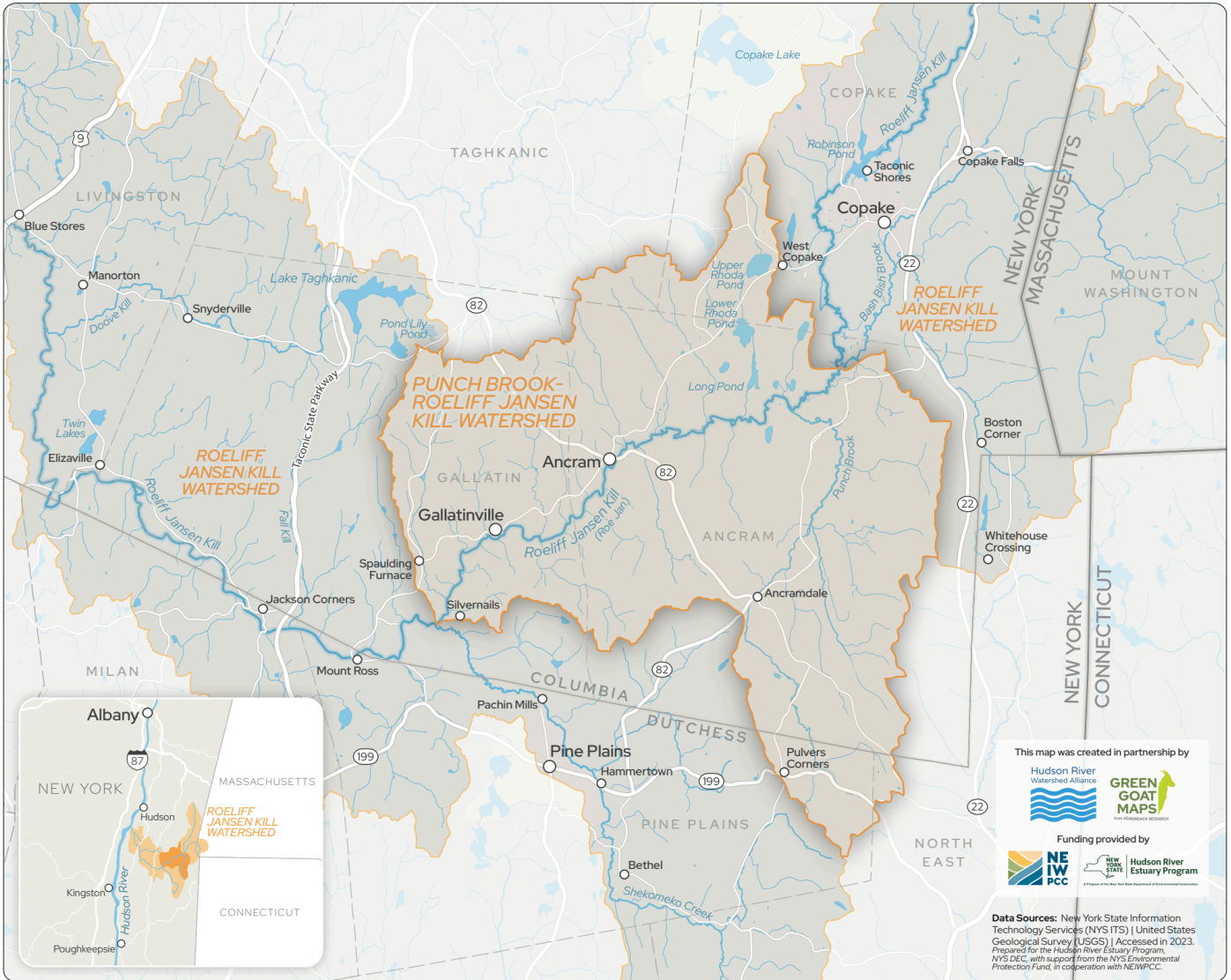


Figure 2. Map of the Punch Brook-Roeliff Jansen Kill watershed.

The United States Geological Survey (USGS) uses [Hydrologic Unit Codes](#) (HUCs) to map and identify specific watersheds at a variety of scales. The USGS has divided and subdivided the land area of the United States into successively smaller hydrologic units,¹ which are classified into different levels. The larger the number of the HUC, the smaller its scale.

¹ Though we use the term watershed and subwatershed to describe the Punch Brook-Roeliff Jansen Kill, it is a hydrologic unit rather than a true watershed according to the definition above, since waters flow into it from upstream hydrologic units. However, in practice, the term hydrologic unit is often used synonymously with the term watershed, even though hydrologic units can be a watershed or only part of a watershed. See Meierdiercks et al. 2024 and Omernik et al. 2017 for a further discussion of the watersheds versus hydrologic units.

The entire Roeliff Jansen Kill watershed is mapped as a HUC 10 (HUC ID 0202000610) at 147,349.87 acres (230.2 square miles). The Punch Brook-Roeliff Jansen Kill is the largest of six HUC 12 watersheds (HUC ID 020200061003) located within that area (Table 1, Figure 3). Figure 2 shows the extent of the Roeliff Jansen Kill watershed, along with the location of the Punch Brook-Roeliff Jansen Kill subwatershed. The Roeliff Jansen Kill watershed is located within the larger Hudson River watershed (Figure 4).

Table 2. From upstream to downstream, the six HUC 12 watersheds within the larger Roeliff Jansen Kill HUC 10 watershed.

HUC size	HUC Name	HUC ID	Area (acres)	Percent of Roeliff Jansen Kill watershed
HUC 12	Headwaters Roeliff Jansen Kill	020200061001	25,261.61	17%
HUC 12	Bash Bish Brook	020200061002	20,418.55	14%
HUC 12	Punch Brook-Roeliff Jansen Kill	020200061003	30,645.74	21%
HUC 12	Shekomeko Creek	020200061004	18,892.43	13%
HUC 12	Fall Kill-Roeliff Jansen Kill	020200061005	22,669.16	15%
HUC 12	Klein Kill-Roeliff Jansen Kill	020200061006	29,462.37	20%
HUC 10	Roeliff Jansen Kill	0202000610	147,349.87	100%

Source: US Geological Survey, National Hydrography Dataset

Publisher: NYS Department of Environmental Conservation Hudson River Estuary Program and the New York State Water Resources Institute at Cornell University

Publication Year: 2016; Information accessed through the Hudson Valley Natural Resource Mapper.

Within the Punch Brook-Roeliff Jansen Kill watershed, the smaller Punch Brook watershed covers 16 square miles within the Town of North East, Town of Pine Plains, and Town of Ancram (USGS StreamStats 2022). The rest of Punch Brook-Roeliff Jansen Kill watershed area is drained by small tributaries or direct drainage to the Roeliff Jansen Kill.

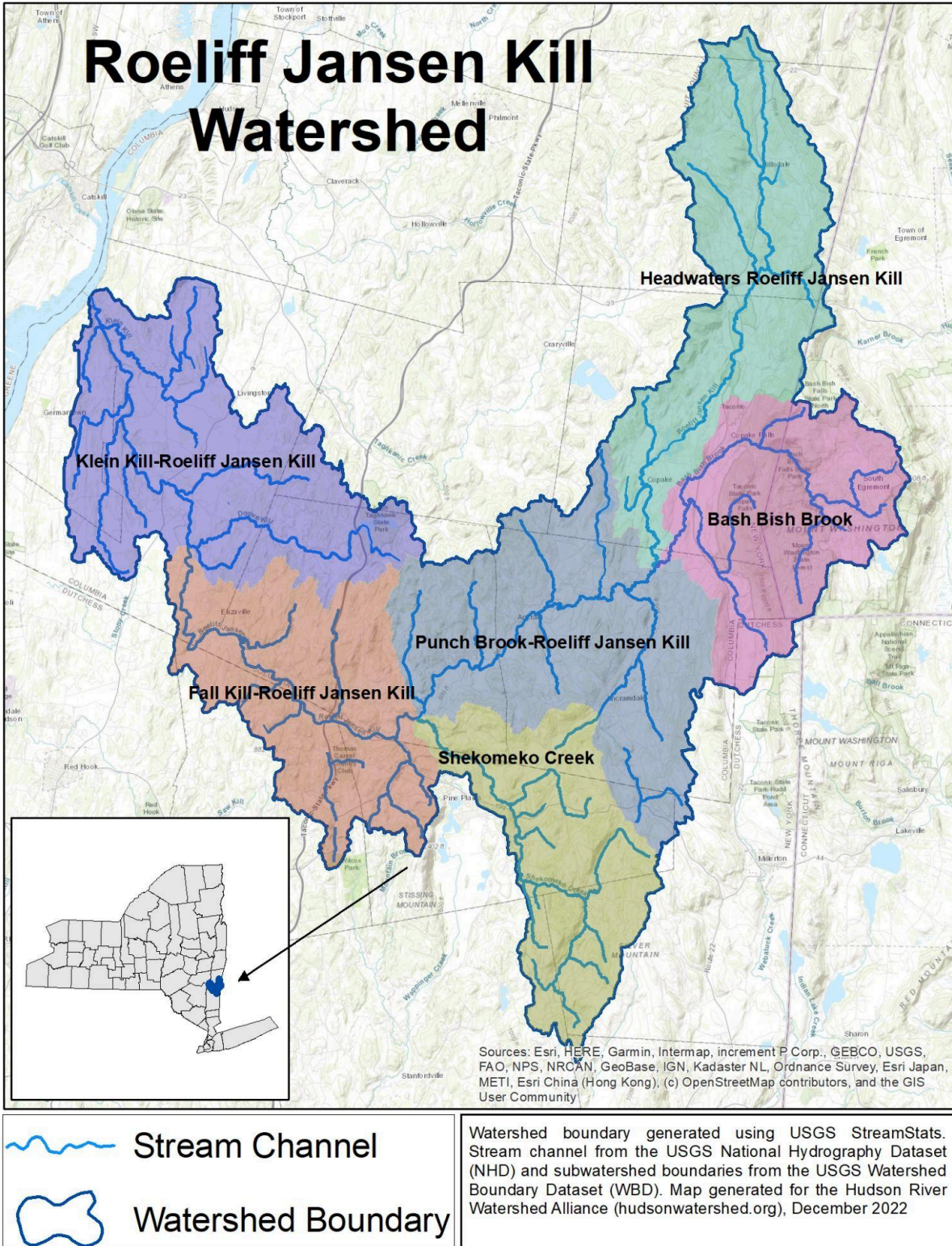
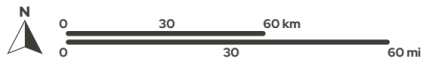


Figure 3. Map of HUC 12 subwatersheds within the larger Roeliff Jansen Kill watershed, including the Punch Brook-Roeliff Jansen Kill subwatershed.

REGIONAL CONTEXT OF THE PUNCH BROOK- ROELIFF JANSEN KILL WATERSHED



- Hudson River Watershed
- Roeliff Jansen Kill Watershed
- Punch Brook-Roeliff Jansen Kill Watershed



Figure 4. The location of the Punch Brook-Roeliff Jansen Kill watershed within the Hudson River watershed. The Punch Brook-Roeliff Jansen Kill is highlighted in dark orange within the larger Roeliff-Jansen Kill HUC 10 watershed in lighter orange.

Topography

Topography within the Punch Brook-Roeliff Jansen Kill watershed ranges in elevation from 361 feet in the Roeliff Jansen Kill's valley to 1,344 feet in the Taconic Mountains (Figure 5). Due to elevation changes within the Punch Brook-Roeliff Jansen Kill watershed, the Punch Brook flows from south to north, towards the Roeliff Jansen Kill, and the Roeliff Jansen kill flows from east to west, towards the Hudson River.

Geology

Bedrock geology shows the types of solid rock that underlie surface materials and soil (Figure 6). Bedrock is made of different kinds of rock, such as granite, limestone, or sandstone. Surficial geology refers to the loose geologic material that lies on top of bedrock (Figure 7). These materials are not soils; they are the unconsolidated materials that lie between the soil zone and the underlying bedrock. For more detail on bedrock and surficial geology within Columbia County, see the [Columbia County Natural Resources Inventory \(2018\)](#).

Soils

Soils are largely derived from surficial deposits, and have numerous different types of classifications, based on parent material, particle size, and organic content. Soils are described, classified and mapped by the [National Resources Conservation Service](#) (NRCS) in county soil surveys, which are compiled digitally in the [Soil Survey Geospatial Layer](#) (SSURGO). A soil survey is the systematic description, classification, and mapping of soils in a particular area.

Figure 8 shows the different kinds of soils within the Punch Brook-Roeliff Jansen Kill watershed, and [Appendix A](#) provides a list of all soil types. For additional information on watershed soils, visit the [Web Soil Survey](#).

Understanding soil drainage, or how quickly water moves through the soil, is valuable for watershed management, providing an understanding of potential land uses and limitations. Figure 8 shows the soil drainage classes across the watershed. See Table 3 for a breakdown of soils by drainage class.

Some soil features are useful for understanding specific watershed characteristics, so they are included in other maps. Poorly drained soils are good indicators of wetland areas, so the [wetlands map](#) (Figure 11) identifies possible or probable wetlands based on the soil drainage class (Kivat and Stevens 2001). The [agriculture map](#) (Figure 12) shows farmland soils best suited for growing crops and livestock.

Table 3. Percent of Soil by Drainage Class.

Drainage Class	Percent of Total within Watershed	Summary
Excessively to well drained	3.03%	39%
Somewhat excessively drained	30.45%	
Somewhat excessively to well drained	5.26%	
Well drained	39.36%	44%
Well drained to moderately well drained	0.05%	
Moderately well to well drained	0.20%	
Moderately well drained	4.31%	
Somewhat poorly drained	3.88%	13%
Somewhat poorly to poorly drained	3.5%	
Somewhat poorly to very poorly drained	2.3%	
Poorly to very poorly drained	3.39%	
Very poorly drained	0.32%	
N/A	3.95%	4%

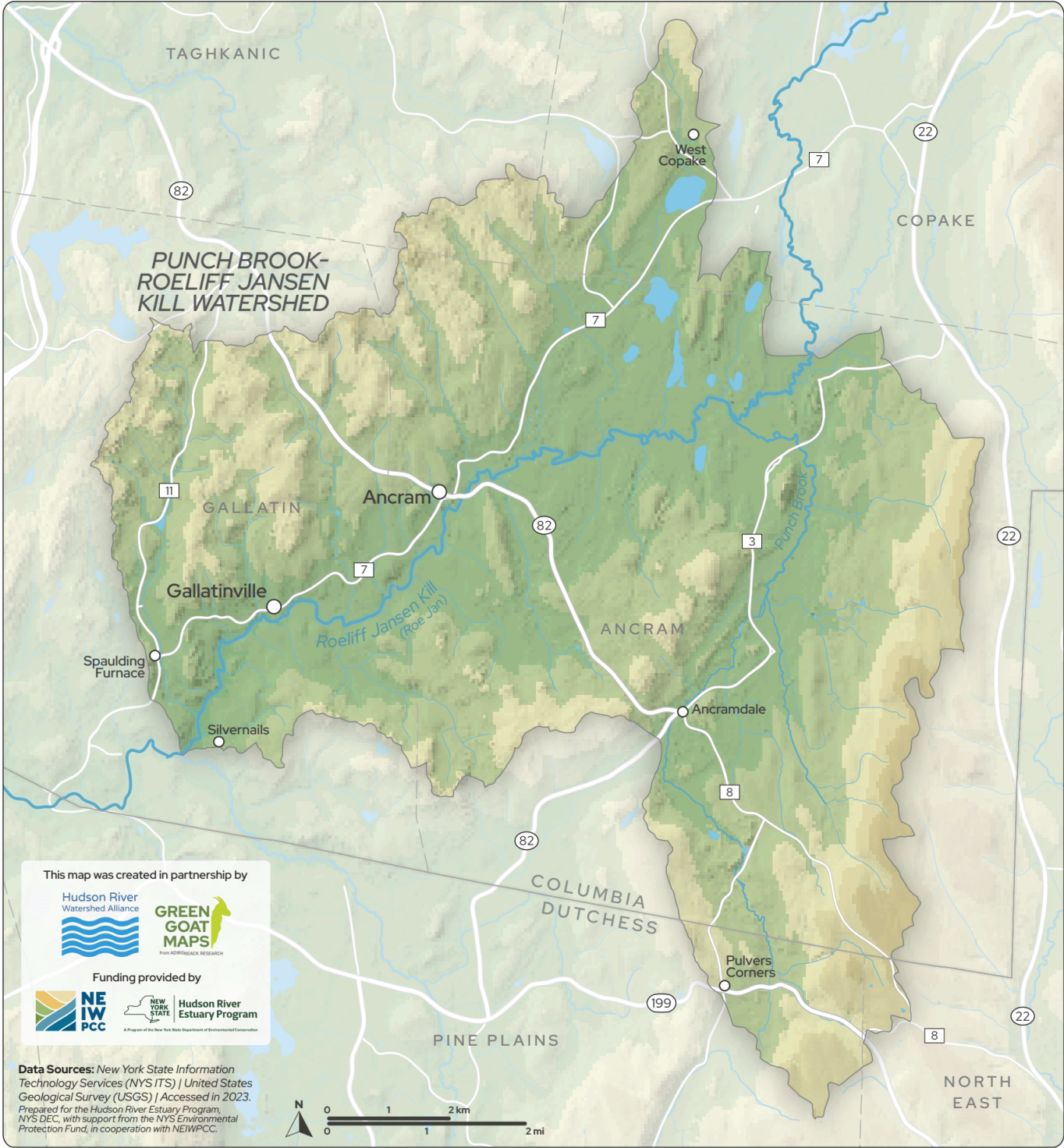
Source: Soil Survey Geographic Database (SSURGO)

Publisher: United States Department of Agriculture Natural Resources Conservation Service

Publication Year: 2003

**TOPOGRAPHY
OF THE PUNCH BROOK-
ROELIFF JANSEN KILL WATERSHED**

Elevation (ft)	
■ <400	■ 800-1000
■ 400-600	■ 1000-1200
■ 600-800	■ 1200-1400
	■ >1400



This map was created in partnership by

Hudson River Watershed Alliance
  **GREEN GOAT MAPS**
from ADRONACK RESEARCH

Funding provided by

   **Hudson River Estuary Program**
A Program of the New York State Department of Environmental Conservation

Data Sources: New York State Information Technology Services (NYS ITS) | United States Geological Survey (USGS) | Accessed in 2023.
 Prepared for the Hudson River Estuary Program, NYS DEC, with support from the NYS Environmental Protection Fund, in cooperation with NEIWPCC.

Figure 5. Topography of the Punch Brook-Roeliff Jansen Kill watershed.

BEDROCK GEOLOGY OF THE PUNCH BROOK-ROELIFF JANSEN KILL WATERSHED

Bedrock Material		
Calcsilicate rock, dolomitic and calcitic marble (Cs)	Elizaville Formation (OCe)	
Biotite granite gneiss (bg)	Lower Wappinger Group (Cw)	Taconic Melange (OCs)
Everett Schist (Cev)	Water (h2o)	Stockbridge Marble (OCst)
Germantown Formation (Cg)	Austin Glen Formation (Oag)	Upper Wappinger Group (Ow)
Poughquag Quartzite (Cpg)	Balmville Limestone (Oba)	Walloomsac Formation (Owl)

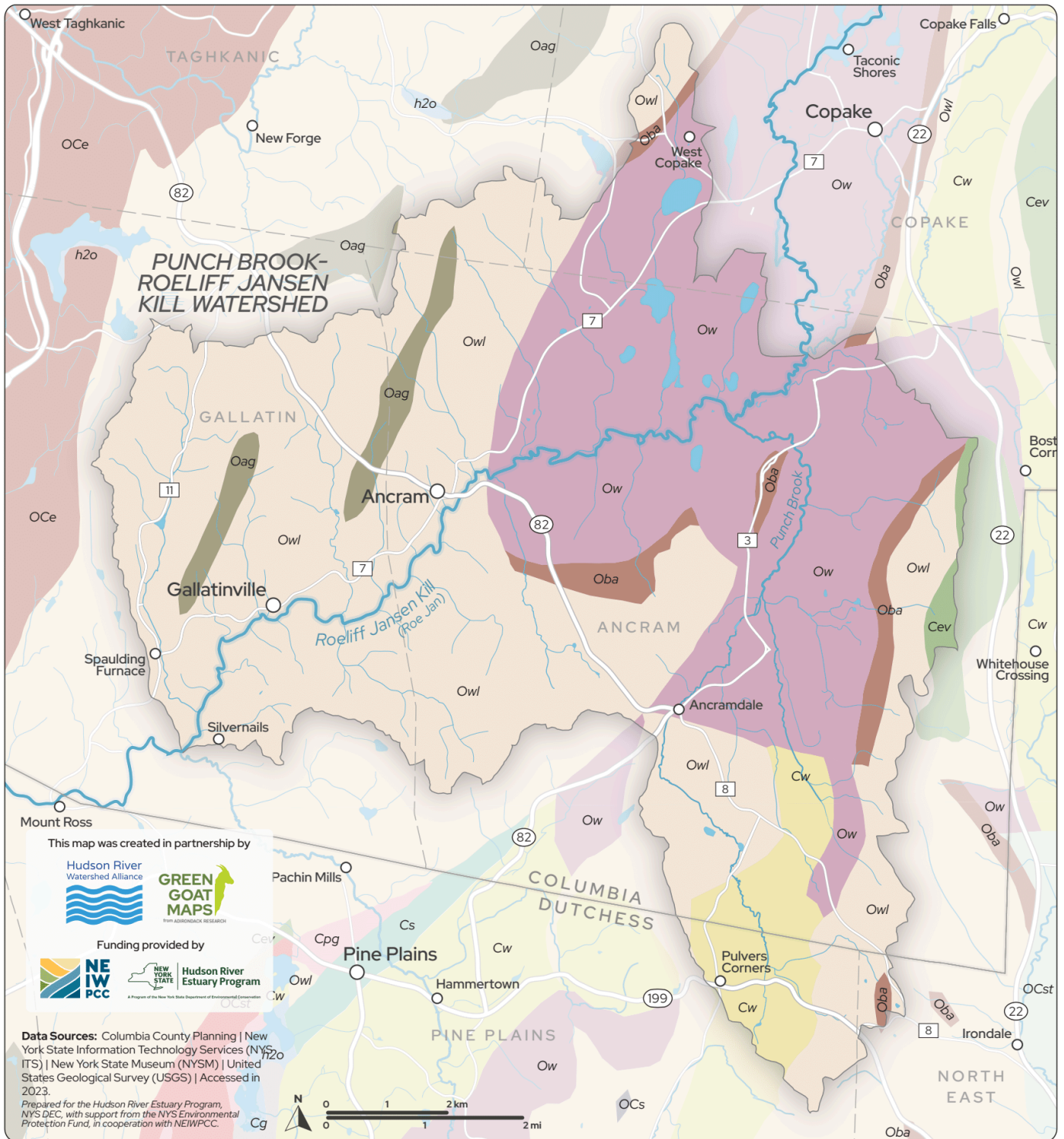


Figure 6. Bedrock Geology of the Punch Brook-Roeliff Jansen Kill watershed.

SURFICIAL GEOLOGY OF THE PUNCH BROOK- ROELIFF JANSEN KILL WATERSHED

Surficial Material

- Recent alluvium (al)
- Kame deposits (k)
- Outwash sand and gravel (og)
- Swamp deposits (pm)
- Bedrock (r)
- Till (t)

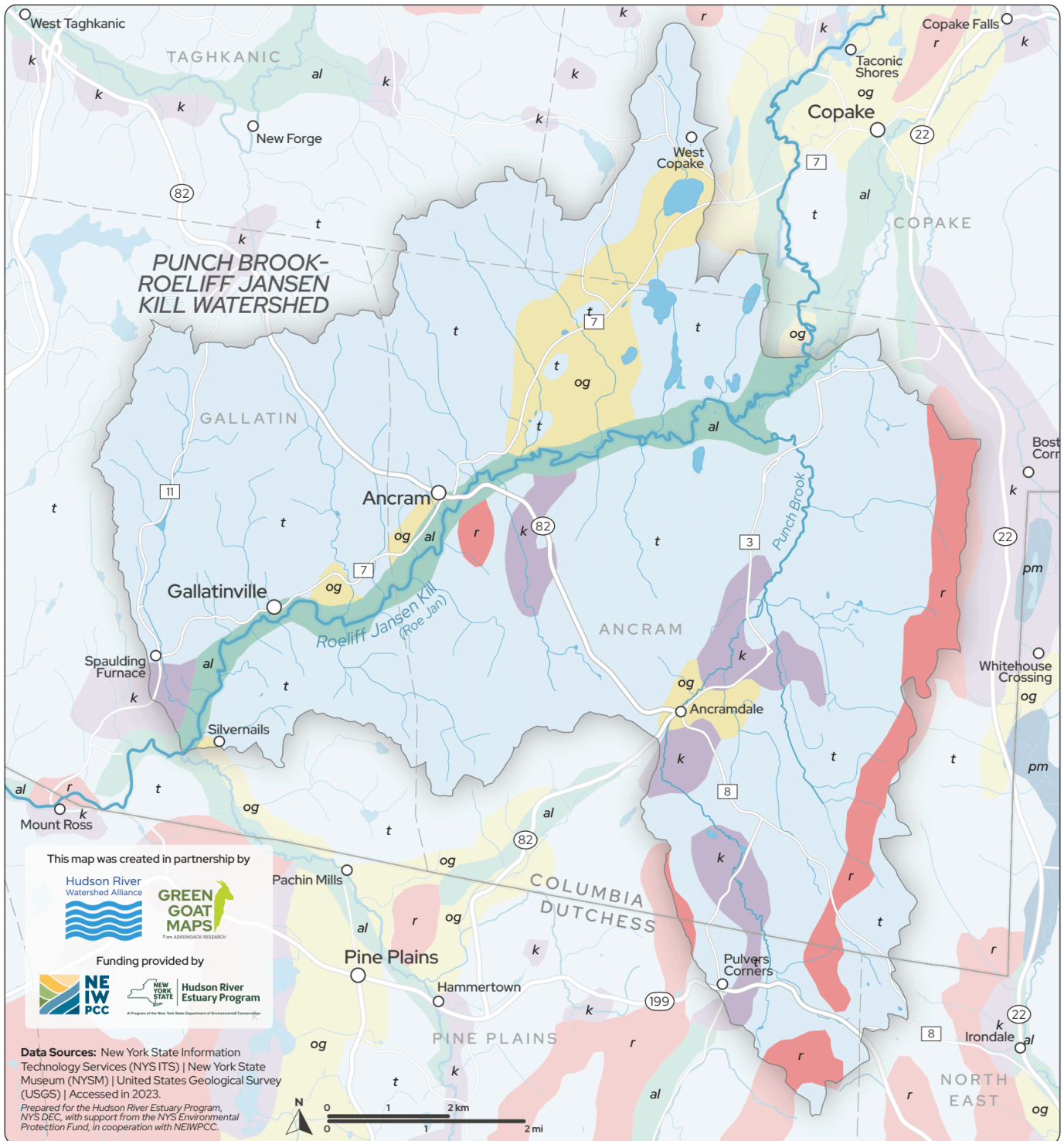


Figure 7. Surficial geology map of the Punch Brook-Roeliff Jansen Kill watershed.

SOILS OF THE PUNCH BROOK-ROELIFF JANSEN KILL WATERSHED

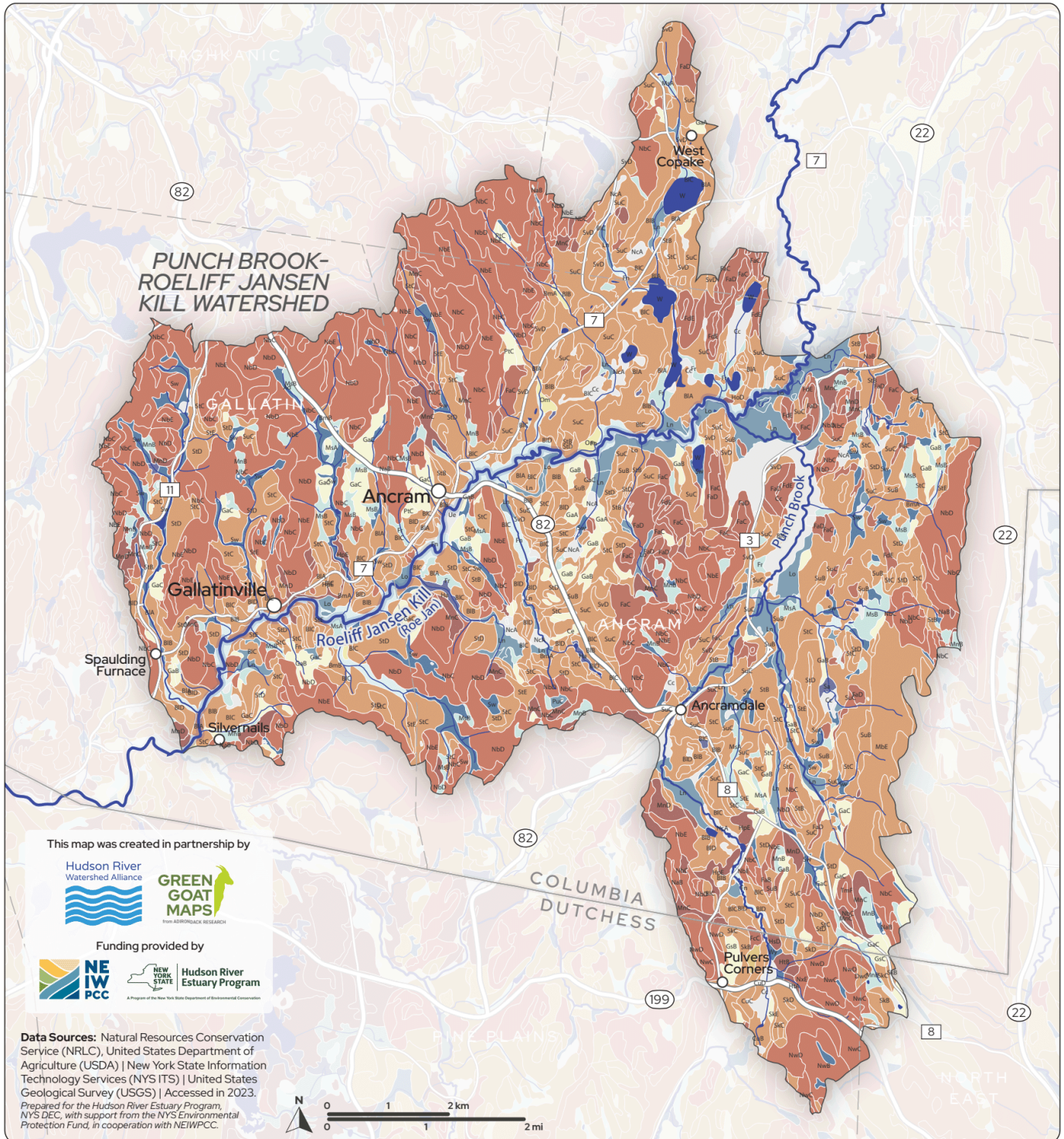
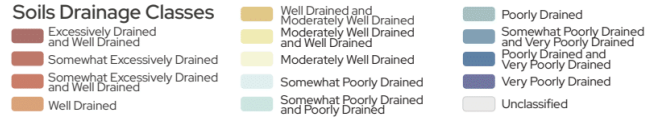


Figure 8. Soils by Drainage Classification

Climate and Climate Change

Climate in the Punch Brook-Roeliff Jansen Kill watershed is characterized by an average annual temperature of 47.8 degrees Fahrenheit and average annual precipitation of 42.1 inches (Table 4). Climate change is already impacting many aspects of our lands and waters, and these impacts are expected to increase in the future. The [New York State Climate Impacts Assessment \(2024\)](#) details the anticipated changes in climate across New York State, including rising temperatures, increased precipitation, rising sea levels, and more frequent and extreme weather events.

The Punch Brook-Roeliff Jansen Kill watershed is located largely within the [North Hudson Valley region](#) of the *New York State Climate Impacts Assessment*. Average temperatures in this region are projected to increase between 4.5°F and 6.4°F by the 2050s and between 5.9°F and 10.5°F by the 2080s, compared with the 1981–2010 average (Table 4). The number of very cold days is expected to decrease, and, compared to the rest of the state, the North Hudson Valley region is projected to experience some of the greatest increases in the number of heat waves per year (New York State 2024).

Total precipitation in the North Hudson Valley region is projected to increase between 3% and 11% by the 2050s and between 6% and 14% by the 2080s relative to the 1981–2010 average (Table 4). This precipitation could increasingly come from more extreme storms, which can lead to flooding or higher streamflow, which may cause more stream bank erosion.

The *New York State Climate Impacts Assessment* also includes detailed information on climate impacts within specific sectors relevant to the Punch Brook-Roeliff Jansen Kill watershed, including [Chapter 2: New York State’s Changing Climate](#), [Chapter 3: Agriculture](#), [Chapter 5: Ecosystems](#), and [Chapter 10: Water Resources](#).

Table 4. Future projected increases in mean annual temperature and precipitation in the North Hudson Valley Region (Albany, Columbia, Rensselaer, Saratoga, Washington counties) relative to 1981-2010. The 25th to 75th percentiles are shown as a range.

Baseline	Mean Temperature (F)	Mean Precipitation (in)
1981-2010	47.8° F	42.1 inches
Future Decades	Mean Temperature Increase (F)	Mean Precipitation Increase
2030s	2.9 - 4.2°	1 - 8%
2040s	3.7 - 5.4°	3 - 9%
2050s	4.5 - 6.4°	3 - 11%
2060s	5 - 7.6°	5 - 12%
2070s	5.5 - 8.9°	6 - 13%
2080s	5.9 - 10.5°	6 - 14%
2100	6.5 - 12.1°	4 - 19%

Source: Bader, D., R. Horton. 2023. *New York State Climate Change Projections Methodology Report. Appendix 1. Prepared for the New York State Climate Impacts Assessment.*

https://nysclimateimpacts.org/wp-content/uploads/2024/01/Appendix-Projections_Tables-1.pdf This work is licensed under CC BY 4.0.

Publisher: New York State

Publication Year: 2024. Accessed via <https://nysclimateimpacts.org>

The NYS Climate Impacts Assessment notes that, “Like all projections, these climate projections have uncertainty embedded within them. Sources of uncertainty include data and modeling constraints, the random nature of some parts of the climate system, and limited understanding of some physical processes. Levels of uncertainty are characterized using state-of-the-art climate models, multiple scenarios of future greenhouse gas concentrations, and recent peer-reviewed literature. Even so, the projections are not true probabilities, so the specific numbers should not be emphasized, and the potential for error should be acknowledged.”

[Climate Smart Communities](#) is a New York State program that helps local governments take action to reduce greenhouse gas emissions and adapt to a changing climate. Municipalities can register for Climate Smart Communities by adopting a municipal resolution. The certification program uses points and a rating system to recognize registered communities that implement specific actions to mitigate climate change and adapt to climate impacts.

All municipalities within the Punch Brook-Roeliff Jansen Kill watershed are participating in the Climate Smart Communities program (Table 5).

Table 5. Climate Smart Community Status for Watershed Municipalities

Watershed Municipality	Climate Smart Communities status
Town of Ancram	Certified Bronze (2022)
Town of Copake	Registered (2009)
Town of Gallatin	Registered (2023)
Town of Taghkanic	Certified Bronze (2023)
Town of North East	Certified Bronze (2022)
Town of Pine Plains	Registered (2018)
Columbia County	Certified Bronze (2022)
Dutchess County	Certified Bronze (2019)

Source: [NYS Climate Smart Communities Participating Communities](#)

Publisher: New York State Climate Smart Communities

Date: Accessed 3/10/24

Lands of the Punch Brook-Roeliff Jansen Kill Watershed

This section focuses on land use, land cover, forests, wetlands, terrestrial habitats, and the built environment, all of which influence the watershed in a variety of ways.

Land Use and Land Cover

Land use describes how people use the landscape, including development and other uses. Land cover indicates the features within the watershed, such as forests, agriculture, wetlands, and other categories. Land use and land cover within a watershed has a direct influence on the health of its waters. Information on land use and land cover comes from the [US Geological Survey's National Land Cover Database](#) (2021) and is derived from remote sensing data.

The Punch Brook-Roeliff Jansen Kill watershed has a mix of land uses, including large areas of forest, farmland, and wetlands (Table 6, Figure 9). The watershed is over 50% forested, primarily with deciduous forest. It also includes a significant amount of agriculture, with 23% hay/pasture, 7% cultivated crops, and less than 1% grassland/herbaceous. About 10% of the watershed is covered by woody and emergent herbaceous wetlands.

Table 6 provides a summary of land use and land cover percentages in the Punch Brook-Roeliff Jansen Kill watershed. For a more detailed breakdown of land use/land cover and specific descriptions, see [Appendix B](#).

Table 6. Land Cover Classes within the Punch Brook-Roeliff Jansen Kill watershed

National Land Cover Database Class	Percent Cover (2021)
Open Water	0.7%
Developed	6.4%
Barren Land	0.1%
Forest	52.7%
Shrubland	0.5%
Herbaceous	0.4%
Cultivated/Pasture	29.7%
Wetlands	9.7%

Source: National Land Cover Database (2021)

Publisher: US Geological Survey

Publication Year: 2021

LAND USE AND LAND COVER OF THE PUNCH BROOK- ROELIFF JANSEN KILL WATERSHED

- Open Water
- Developed, Open Space
- Barren Land
- Cultivated Crops
- Woody Wetlands
- Developed, Low Intensity
- Deciduous Forest
- Grassland/Herbaceous
- Emergent Herbaceous Wetlands
- Developed, Medium Intensity
- Evergreen Forest
- Mixed Forest
- Pasture/Hay
- Developed, High Intensity

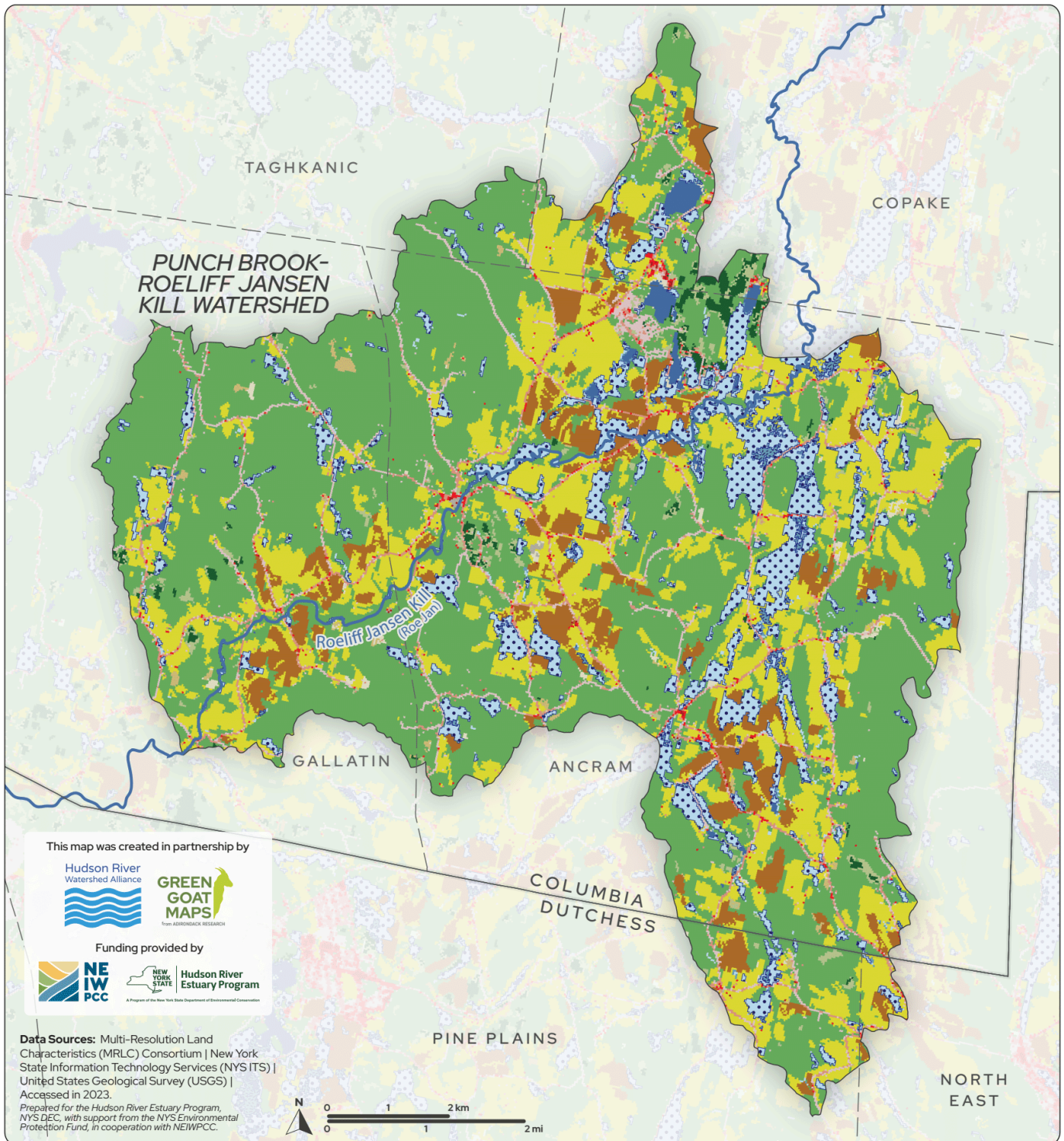


Figure 9. Land Use and Land Cover in the Punch Brook-Roeliff Jansen Kill watershed.

Local Land Use Plans, Policies, and Practices

Land use and land cover affect how water moves across the landscape and what potential pollutants may be present in stormwater that runs off of land and into streams, lakes, and wetlands. In New York State, individual towns, cities, and villages decide how land is used in their communities through local plans, policies, and practices that guide new development, which, in turn, affects the future protection of natural resources.

Comprehensive plans establish a community's vision for the future and outline a roadmap for achieving that future by guiding land use patterns and development. Comprehensive plans often describe natural resources and include goals and recommendations for those resources. Each town in the Punch Brook-Roeliff Jansen Kill watershed has a comprehensive plan (Table 7).

Comprehensive plans need to be implemented through zoning and other local policies and practices. Zoning controls the type and intensity of land use within defined districts or zones. Each town in the watershed has a zoning law (Table 7).

Natural resources inventories map and describe important, naturally occurring resources in a municipality, including forests, streams, wetlands, wildlife habitat, soils, and geology. Many also include agricultural, historic, scenic, and recreational assets. Both Columbia and Dutchess Counties have natural resources inventories, covering the full extent of the Punch Brook-Roeliff Jansen Kill watershed (Table 7).

Natural Resource Summaries from the Hudson River Estuary Program integrate program data with science-based information from a variety of sources to assist municipalities with understanding their important natural areas and habitats, as well as water resources and predicted climate impacts. Summaries have been prepared for Ancram, Copake, and Gallatin (Table 7).

Other local plans that are relevant to watersheds include natural resources conservation plans and local waterfront revitalization plans. The Town of Ancram has a Natural Resources Conservation Plan (Table 7). Local waterfront revitalization plans are comprehensive land and water use programs that express a community vision for the waterfront area and identity projects and policies that achieve that vision. The plans are funded by the NYS Department of State for coastal waterbodies as well as [specific inland waterways designated](#) by the NYS Legislature, including the Roeliff Jansen Kill.

The [Town of Copake Waterfront and Community Revitalization Plan](#) (2021) is a local waterfront revitalization plan created for Copake's three designated inland waterways: the Roeliff Jansen Kill, Bash Bish Brook, and Taghkanic Creek. The plan's tagline is "Copake, NY: Woven by Water" and its shared vision includes a healthy, equitable and livable community inspired by nature at every turn.

Table 7. Municipal land use plans and inventories in the Punch Brook-Roeliff Jansen Kill watershed.

Watershed Municipality	Comprehensive Plan	Zoning	Natural Resources Inventory or Summary	Other Relevant Local Plan
Town of Ancram	Comprehensive Plan (2019)	Zoning Law (2022)	Habitat Summary (2011)	Natural Resources Conservation Plan (2015)
Town of Copake	Comprehensive Plan (2011)	Zoning Law (2018)	Habitat Summary (2015) Climate Summary (2014) ² Water Resources Summary (2014)	Waterfront and Community Revitalization Plan (2021)
Town of Gallatin	Comprehensive Plan (2023)	Zoning Law (2011)	Habitat Summary (2021)	
Town of Taghkanic	Comprehensive Plan (2009)	Zoning Law (2017)		
Town of North East	Comprehensive Plan (1992)	Zoning Law (1979)		
Town of Pine Plains	Comprehensive Plan (2019)	Zoning Law (2009)		
Columbia County			Natural Resources Inventory (2018) NRI Data Viewer (2018)	
Dutchess County			Natural Resource Inventory (2010) ³ Natural Resource Inventory (2024)	

² More up-to-date climate change projections are now available through the [New York State Climate Impacts Assessment](#) (2024).

³ While a more up-to-date Natural Resource Inventory is now available, this 2010 report provides a valuable baseline and summary of relevant conditions.

Forests

More than 50% of the Punch Brook-Roeliff Jansen Kill watershed is forested (Figure 9, Table 6), including significant areas of high quality forest habitats. Forests provide numerous benefits for water quality, water quantity, and habitat. For more information about the value of forests in improving water quality, see the [Protecting Forests for Clean Water](#) (2024) report by the Open Space Institute.

Figure 10 shows large forested areas in the Punch Brook-Roeliff Jansen Kill watershed based on the Hudson Valley Forest Condition Index from the New York Natural Heritage Program and Forest Block Linkage Zones, created by the New York Natural Heritage Program and The Nature Conservancy.

There are 41 forest patches over 100 acres either partially or wholly within the Punch Brook-Roeliff Jansen Kill watershed, ranging from 102 to 3,485 acres. The Hudson Valley Forest Condition Index estimates the condition of each forest patch relative to others in the Hudson River Estuary watershed using a variety of region-wide data. This assessment shows that 41% of the forest patches in the Punch Brook-Roeliff Jansen Kill watershed are high quality (in the top 20% of all patches in the region), shown on Figure 10 in purple, blue, and dark green. For more information on the individual patches and the core forests within the patches, use the [Hudson River Natural Resources Mapper](#). For more information about the data, see the [Forest Condition Index Fact Sheet](#) and the [Hudson Valley Forest Patch Update and Assessment Final Report](#) (2019).

The largest and highest quality forest patches are in the northwest part of the watershed, which is also an important Forest Linkage Zone (Figure 10). Forest Linkage Zones connect Priority Large Forested Areas, shown on Figure 11 outside the watershed in the Taconics. The linkage areas are largely intact forested connections between Priority Large Forested Areas that allow animals and plants to move or disperse across the landscape. Forest linkages enable genetic exchange among populations and will allow plants and animals to move north and higher in elevation as the climate warms. The Forest Linkage Zone in the Punch Brook-Roeliff Jansen Kill watershed area serves as a high quality forest link between the Berkshire/Taconic/Green Mountains and the Hudson Highlands, and is key for maintaining regional terrestrial connectivity. For more information on the connections between forests, watersheds, and Forest Linkage Zones, see the [Taghkanic Headwaters Conservation Plan](#) (2022).

[New York State's 480a Program](#), overseen by NYS Department of Environmental Conservation, provides tax exemptions to private forest landowners with at least 50 adjoining acres that are exclusively devoted to and suitable for forest crop production (e.g., timber) and stocked with trees sufficient to produce a merchantable forest crop within 30 years. The webmap of [480a Program Properties across New York State](#) shows several enrolled properties within the Punch Brook-Roeliff Jansen Kill watershed.

FORESTS OF THE PUNCH BROOK- ROELIFF JANSEN KILL WATERSHED

**Forest Patches Over 100 Acres
(by Forest Condition Index Percentile)**

- 99-100	- 60-80
- 95-99	- 40-60
- 90-95	- 20-40
- 80-90	- 0-20

Terrestrial Connectivity

- Regional Forest Linkage
- Priority Large Forested Areas

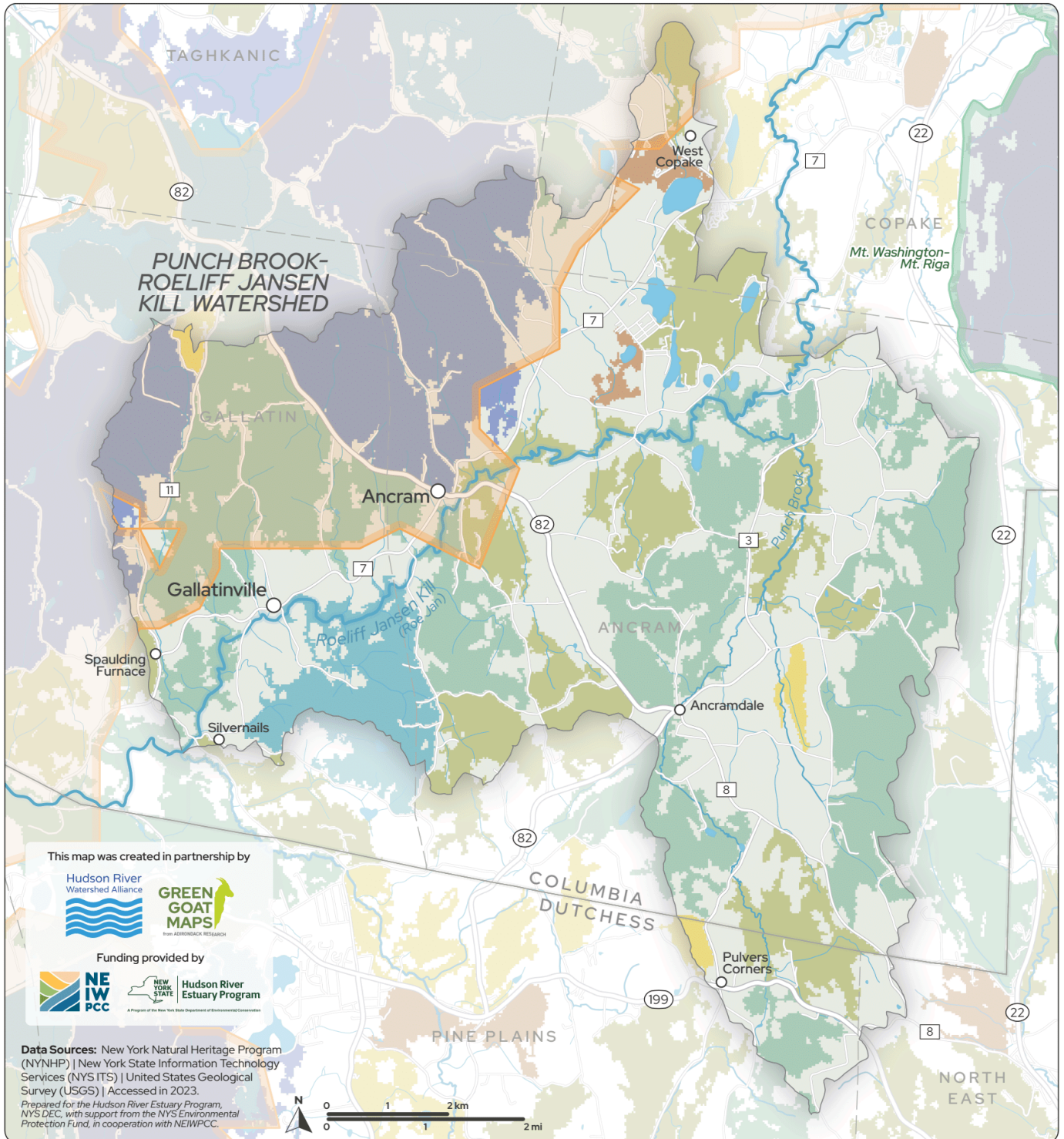


Figure 10. Forests in the Punch Brook-Roeliff Jansen Kill watershed.

Wetlands

Wetlands are areas saturated by enough surface water or groundwater to support distinctive plants that are adapted for life in saturated soil conditions. Among other watershed benefits, wetlands provide important habitat for many plant and animal species, help manage flooding, improve water quality by reducing sediments and nutrients, and provide opportunities for recreation. For more information on wetlands as habitat within the Punch Brook-Roeliff Jansen Kill watershed, see the [Terrestrial Habitats](#) section.

Figure 11 shows wetlands in the Punch Brook-Roeliff Jansen Kill watershed based on three GIS datasets: the federal National Wetlands Inventory, county soil surveys, and New York State Regulated Wetlands.

The [National Wetlands Inventory](#) includes wetlands of all sizes, along with basic habitat information. These maps, developed by the US Fish and Wildlife Service, are not intended for regulatory purposes. Wetlands were identified based on aerial photo interpretation and some field checking. According to the National Wetlands Inventory, there are 1,551 wetlands covering about 9% of the Punch Brook-Roeliff Jansen Kill watershed. Most of these wetlands are small; 96% are less than 9.84 acres (Table 8, National Wetlands Inventory 2023).

For more information on individual wetlands, including their size and characteristics, use the [Hudson River Natural Resources Mapper](#).

Table 8. Freshwater wetland characteristics (based on National Wetland Inventory)

Wetland Type	Count	Total Area (acres)
Freshwater Emergent Wetland	401	853.34
Freshwater Forested/Shrub Wetland	501	1,396.79
Freshwater Pond	286	221.92
Lake	4	191.63
Riverine	359	361.00
Total	1,551	3,024.68

*Source: National Wetlands Inventory
Publisher: US Fish and Wildlife Service
Publication Year: 2023*

Soil data is also useful for identifying wetlands. Because the National Wetland Inventory tends to underestimate wetland area, the [Biodiversity Assessment Manual for the Hudson River](#)

[Estuary Corridor](#) (2001) recommends using hydric soil information to better understand the extent of wetlands.

The National Resources Conservation Service identifies which soils identified in county surveys are “hydric” or “wetland” soils ([Hydric Soils List](#)). “Poorly drained” and “very poorly drained” soils indicate probable wetland areas. “Somewhat poorly drained soils” suggest the location of possible wetland areas. Hydric soils may overestimate wetland areas, which is why it is important to verify map data in the field. For more information on the utility of soil maps for estimating wetland areas, see [Creating a Natural Resource Inventory](#) (2014) and the [Biodiversity Assessment Manual for the Hudson River Estuary Corridor](#) (2001).

Figure 11 shows approximately 4,100 acres of probable or possible wetlands in the watershed, covering about 13% of the watershed area, based on hydric soils data. Possible and Probable wetlands can also be viewed on the [Hudson Valley Natural Resources Mapper](#).

New York State wetland maps were created to implement the [New York State Freshwater Wetlands Act](#), and therefore do not show all wetlands that may be present in an area. These maps show wetlands larger than 12.4 acres or smaller wetlands that are designated “of unusual local importance” that require a permit for alteration within the wetland or its 100-foot buffer. Figure 11 shows these mapped wetlands, along with a 500 foot “check zone” surrounding each wetland where the actual wetland may occur. Online maps of New York State’s freshwater wetlands and Check Zones are available through the [NYS DEC’s Environmental Resource Mapper](#).

Cautionary note: Starting on January 1, 2025, the current NYS Freshwater Wetlands Maps will no longer limit NYS DEC regulatory jurisdiction to wetlands depicted on those maps. Instead, the maps will become informational and any wetlands that meet the applicable definition and criteria will be regulated by NYS DEC and subject to permitting, regardless of whether they appear on the informational maps. Contact the regional NYS DEC office for more information about wetland regulations.

WETLANDS OF THE PUNCH BROOK- ROELIFF JANSEN KILL WATERSHED

- Hydric Soils**
- Probable Wetlands
 - Possible Wetlands
- Wetland Designations**
- NYS Regulated Freshwater Wetlands
 - NYS Regulated Freshwater Wetlands Checkzone
 - National Wetlands Inventory

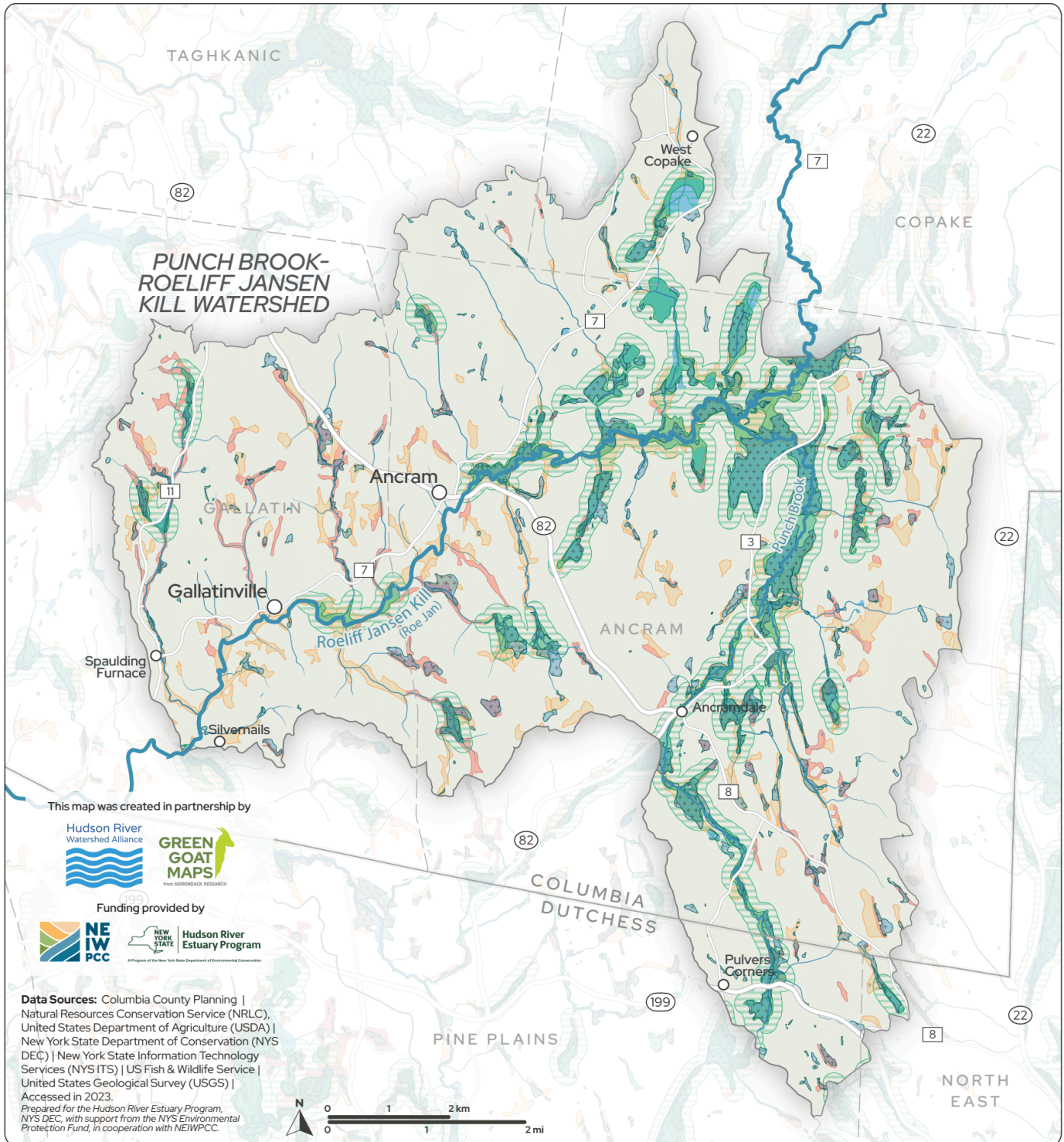


Figure 11. Wetlands in the Punch Brook-Roeliff Jansen Kill watershed.

Agriculture

Agriculture plays a prominent role in the watershed’s rural character and economy and is highly valued by watershed communities. The Punch Brook-Roeliff Jansen Kill watershed includes a significant amount of agriculture, with 23% hay/pasture, 7% cultivated crops, and less than 1% grassland/herbaceous (NLCD 2021).

Figure 12 shows agricultural land in the Punch Brook-Roeliff Jansen Kill watershed based on County Soil Survey and Columbia County’s Agricultural Districts. About 44% of the Punch Brook-Roeliff Jansen Kill watershed has farmland soils, defined as Prime Farmland, Prime Farmland if Drained, and Farmland of Statewide Importance (Table 9).

Table 9. Farmland Soils in the Punch Brook-Roeliff Jansen Kill watershed.

Soil Type	Percentage of soils in the watershed
Prime Farmland	9.6%
Prime Farmland if drained	7.4%
Farmland of Statewide Importance	28.6%
Total Farmland Soils	43.8%

Source: Soils - Farmland

Publisher: Columbia County Planning Department

Publication Year: 2019

The watershed also has large areas of agricultural districts. In New York State, [Agricultural Districts](#) are created by County Agricultural and Farmland Protection Boards to promote land for farming purposes by reducing the regulatory and tax burdens. Landowners apply to be included in a district, which must be predominantly viable agricultural land and conform to other criteria to be eligible for the benefits. Agricultural Districts are under the protection of NYS Agricultural District Law, administered by the New York State Department of Agriculture and Markets. Note that Figure 12 includes only data from Columbia County. Use the [Dutchess County Agricultural Districts Viewer](#) for more information on Dutchess County Agricultural Districts.

Several municipalities within the watershed have developed farmland preservation plans to support agriculture in their communities, including the [Town of Copake Agriculture and Farmland Preservation Plan](#) (2014), [Town of Ancram Agriculture and Farmland Preservation Plan](#) (2011), [Town of North East Agricultural and Farmland Protection Plan](#) (2010) [Columbia County Agriculture and Farmland Protection Plan](#) (2013), and [Dutchess County Agricultural and Farmland Protection Plan](#) (2015).

AGRICULTURE OF THE PUNCH BROOK- ROELIFF JANSEN KILL WATERSHED

Farmland Soils

- Prime Farmland Soils
- Prime Farmland Soils if Drained
- Farm Soils of Statewide Importance

- Agricultural Districts

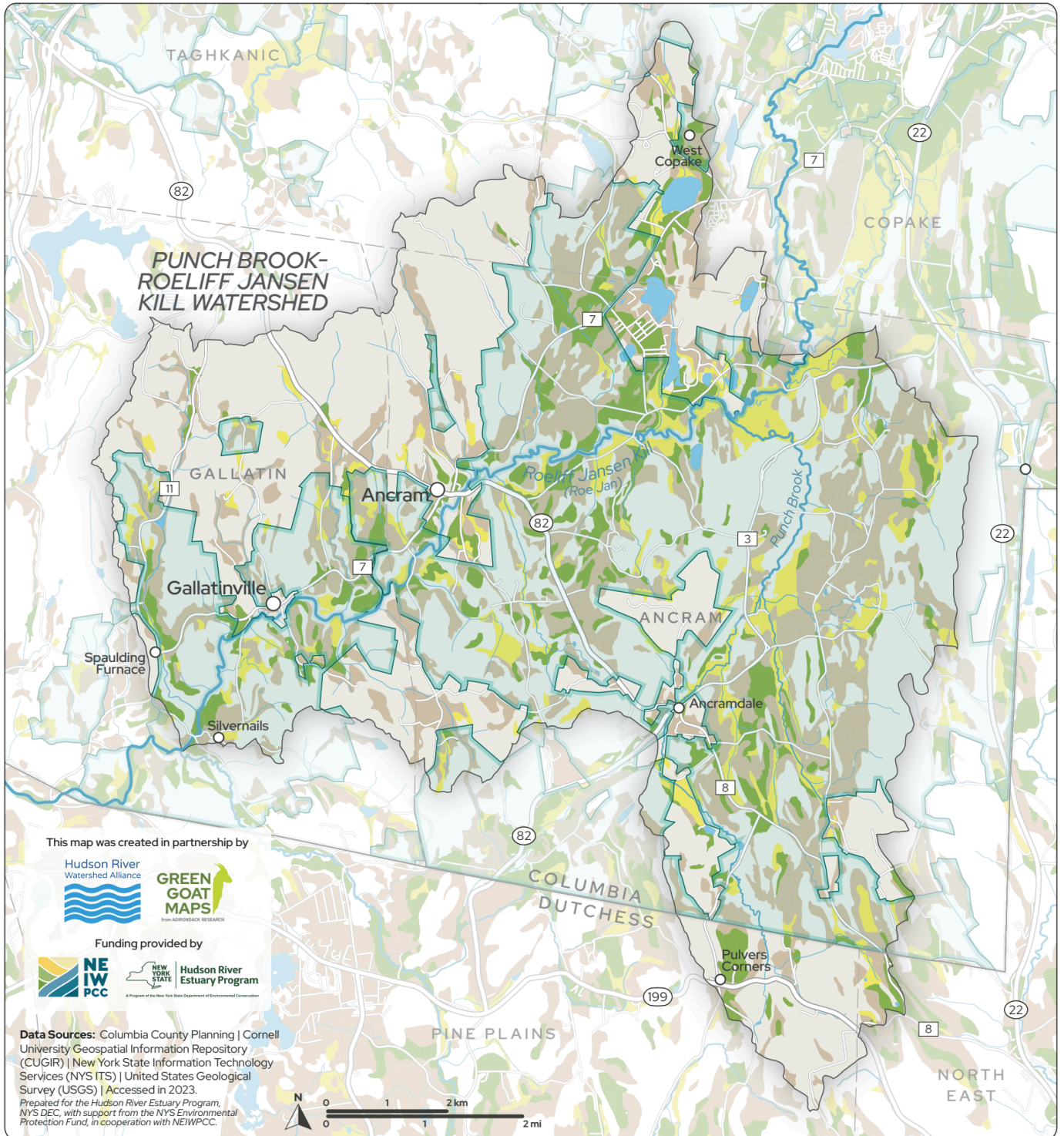


Figure 12. Agriculture in the Punch Brook-Roeliff Jansen Kill watershed.

Terrestrial Habitats

The Punch Brook-Roeliff Jansen Kill watershed includes significant terrestrial and wetland habitat areas. Figure 13 focuses on significant habitat areas available in GIS and mapped by New York State, along with the Hawthorne Valley Association Farmscape Ecology Program. These maps are known to be incomplete. Additional information about terrestrial and wetland habitats can be found in the [Local Habitat Mapping](#) section, along with the [Local Land Use Plans](#) section.

New York Natural Heritage Program Important Areas and Significant Natural Communities

The [New York Natural Heritage Program](#) is the most complete source of information about rare plants, rare animals, and significant ecosystems in New York State. They have generated Important Areas for specific rare animal, rare plant, and significant natural community occurrences within the Hudson River estuary watershed to support inventory and planning. These areas are modeled and mapped based on the life histories and habitats of the species or species group and the community type's size and natural ecological processes.

The Punch Brook Roeliff Jansen Kill watershed includes Known Important Areas for Rare Plants, Rare Wetland Animals, Rare Terrestrial Animals, and Bat Foraging Areas (New York Natural Heritage Program 2018). Although the Important Areas are based on best available information, they do not represent a comprehensive inventory of all important species or habitats. For more information about how Important Areas were developed and can be used, see the [Natural Heritage Important Areas Fact Sheet](#).

In addition to Important Areas, New York Natural Heritage Program has mapped [Significant Natural Communities](#) across New York State. These areas are considered significant from a statewide perspective because they are rare or high quality based on size, habitat condition, and quality of the surrounding landscape. Significant natural communities may provide habitat for rare plants and animals, support intact ecological processes, and contribute other ecosystem benefits. There are three Significant Natural Communities in the Punch Brook-Roeliff Jansen Kill watershed (Table 10). For more information about important areas and significant natural communities, see the [Hudson River Natural Resources Mapper](#). For more information on the specific rare plants, rare animals and natural communities in the watershed, request the data from the [New York Natural Heritage Program](#).

The Punch Brook Roeliff Jansen Kill watershed contains specific rare plant and animal species, including Rare Dragonflies and Damselflies, Marsh Fen Moth, New England Cottontail (Listed as Special Concern by New York State). The watershed also includes Plants Listed as Endangered, Threatened, or Rare by NYS; Animals Listed as Endangered or Threatened; and Bats Listed as Endangered or Threatened. For more specific information on endangered or threatened species, contact the NYS DEC Regional Office. Generalized locations of [Rare Plant and Animal Species](#), as well as [Significant Natural Communities](#), are available on the [NYS DEC's Environmental Resource Mapper](#).

Table 10. Significant Natural Communities in the Punch Brook-Roeliff Jansen Kill watershed.

Community Name	System	Acres	Global Rank	Watershed Location
	Subsystem		State Rank	
Shallow emergent marsh	Freshwater Nontidal Wetlands	69.00	G5	Drowned Lands Swamp Conservation Area
	Open Mineral Soil Wetlands		S6	
Red maple-tamarack peat swamp	Freshwater Nontidal Wetlands	70.00	G3G4	Drowned Lands Swamp
	Forested peatlands		S2S3	
Red maple-tamarack peat swamp	Freshwater Nontidal Wetlands	50.00	G3G4	South of Miller Pond
	Forested peatlands		S2S3	

Source: Significant Natural Communities

Publisher: New York Natural Heritage Program

Publication Year: 2018; Information accessed through the Hudson Valley Natural Resource Mapper

Significant Biodiversity Areas in the Hudson River Valley

[Significant Biodiversity Areas](#) are regionally significant landscape areas in the Hudson River estuary watershed that contain a high concentration of biodiversity or unique ecological features. They were identified by the NYS Department of Environmental Conservation Hudson River Estuary Program with the New York Cooperative Fish and Wildlife Research Unit at Cornell University and the NY Natural Heritage Program.

The eastern portion of the Punch Brook-Roeliff Jansen Kill watershed includes the Harlem Valley Calcareous Wetlands, which covers 94,322 total acres across eastern Columbia and Dutchess counties (Figure 13, Hudson River Estuary Wildlife and Habitat Conservation Framework 2006). The Harlem Valley Calcareous Wetlands is one of 22 Significant Biodiversity Areas across the Hudson River estuary watershed.

Local Habitat Mapping

Locally, environmental organizations have also mapped important habitats through several planning processes. In 2010, the Hawthorne Valley Association Farmscape Ecology Program mapped the rare habitat of floodplain forests in Columbia and Dutchess counties, including “ancient” floodplain forests that had continuous forest cover since at least the 1940s (Figure 13). Their report, [Floodplain Forests of Columbia and Dutchess Counties, NY: Distribution](#),

[Biodiversity, Classification, and Conservation](#) (2010), describes the distribution of mapped floodplain forests, along with distinctive plant and animal species.

Hudsonia Ltd. mapped significant habitats in the [Town of North East](#) (2008) and [Town of Pine Plains](#) (2009), which can be viewed on [Dutchess County's Natural Resource Inventory Environmental Mapper](#). Volunteers from the Town of Ancram, with support from Hudsonia, Ltd., completed [a map of significant habitats](#) (2020). Additional information on the habitats they mapped can be found in Ancram's [Natural Resources Conservation Plan](#) (2015).

For more information about terrestrial habitats included in municipal plans and reports, see the [Local Land Use Plans](#) section. For information about fish and aquatic habitats, see the [Aquatic Habitats](#) section under Waters of the Punch Brook-Roeliff Jansen Kill Watershed.

SIGNIFICANT HABITATS OF THE PUNCH BROOK- ROELIFF JANSEN KILL WATERSHED

Areas Important to the Health of:

- Significant Wetland Communities
- Rare Plants
- Rare Terrestrial Animals
- Rare Wetland Animals

- Significant Wetland Community Boundaries
- Floodplain forests
- Harlem Valley Calcareous Wetlands Significant Biodiversity Area

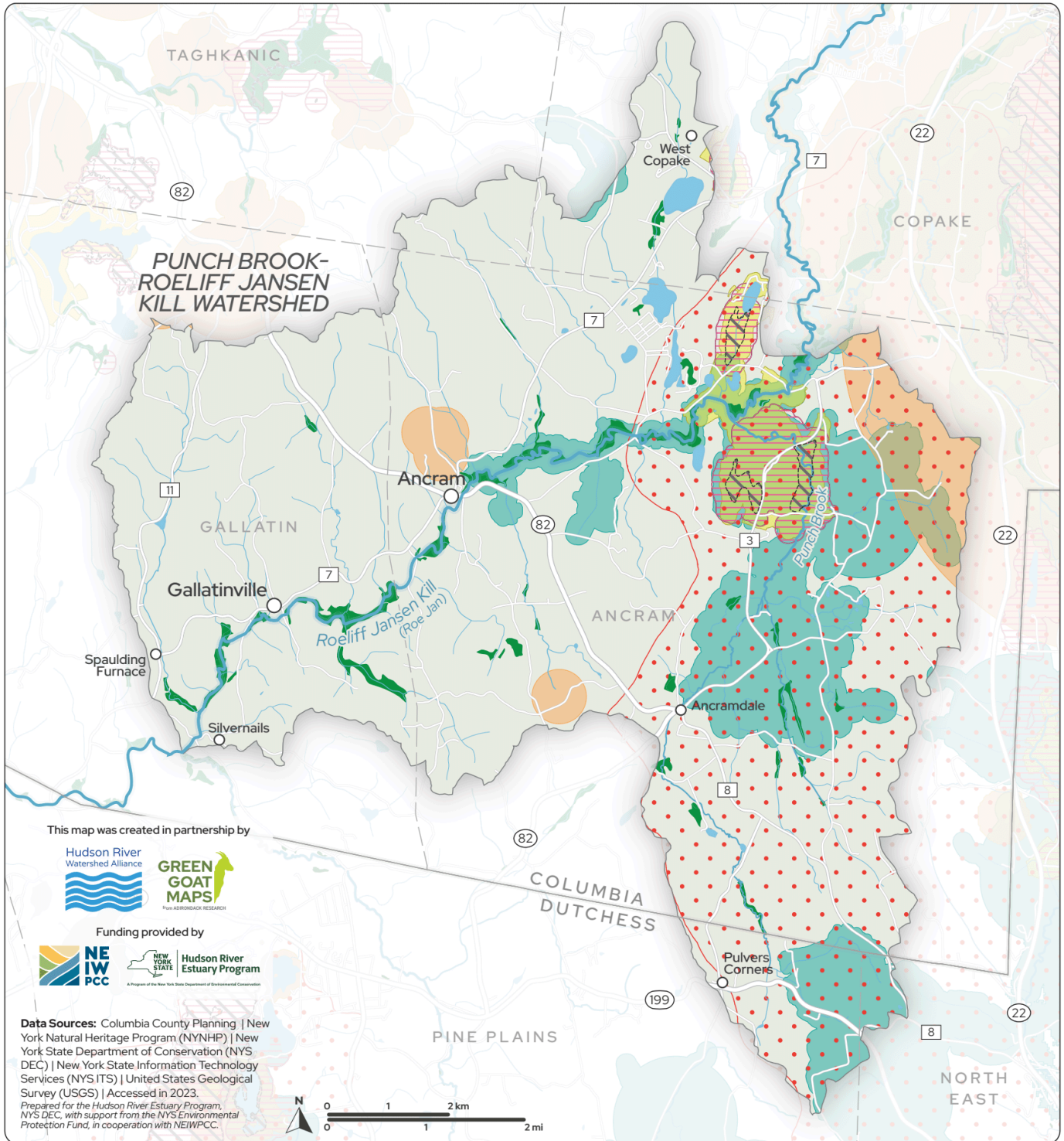


Figure 13. Significant Terrestrial and Wetland Habitats in the Punch Brook-Roeliff Jansen Kill watershed.

Protected Lands

The Punch Brook-Roeliff Jansen Kill watershed contains many parcels that are protected in some way. Figure 14 includes lands open to the public for recreation, as well as private lands where landowners have agreed to limit the future development of their properties to protect valuable natural resources, like farms and forests. Thus, protected lands on the map may be public or private, open or closed to public access, and permanently protected from development or subject to changes in management.

The [Doodletown Wildlife Management Area](#) is located in the northwest portion of the Punch Brook-Roeliff Jansen Kill watershed (Figure 14). This 1,078 acre area is managed by NYS DEC's Division of Fish and Wildlife for wildlife management, wildlife habitat management, and wildlife-dependent recreation.

According to the NYS DEC's Doodletown Wildlife Management Area (WMA) website, "The WMA is primarily forested with semi-mature to mature forest stands of oak, maple, birch, and aspen. Several wetlands and vernal pools are scattered throughout the property providing breeding and nursery habitat for many species of amphibians. This WMA also has several recreational opportunities, such as hunting, trapping, and bird watching... An important species to be managed at Doodletown WMA is the New England cottontail, a species of special concern in New York State... Young forest created will provide critical habitat to support populations of New England cottontail and many other species of wildlife including ruffed grouse, cerulean warbler, and bobcat." Additional information is available in the NYS DEC's [Habitat Management Plan for Doodletown Wildlife Management Area 2018 – 2027](#) (2018, revised 2023).

Columbia Land Conservancy owns three conservation areas in the watershed, including two that are open to the public (Figure 14). [Drowned Lands Swamp Conservation Area](#) protects 114 acres of forests and wetlands that are part of the larger Harlem Valley wetlands complex. The conservation area borders the west bank of the Punch Brook and includes 1.5 miles of trails. [Overmountain Conservation Area](#) straddles the Punch Brook-Roeliff Jansen Kill watershed divide, on the watershed's eastern border. It includes 1,700 acres of land with 10 miles of trails, a gazebo, and scenic overlooks of both the Catskill and Taconic Mountains. This site is managed for regionally-rare grassland birds, whose populations are threatened. Hunting is permitted by permit at Overmountain. The third conservation area is located along the Roeliff Jansen Kill, and is not open to the public.

The Punch Brook-Roeliff Jansen Kill watershed includes a number of privately-owned lands with conservation easements that are not open to the public. Conservation easements are voluntary preservation agreements where landowners limit the future development of the properties to protect valuable natural resources. These conservation easements are mostly held by Columbia Land Conservancy (Figure 14). Dutchess Land Conservancy conservation easements are available as [PDF maps](#).

PROTECTED LANDS OF THE PUNCH BROOK- ROELIFF JANSEN KILL WATERSHED

- Open to Public Access
- Conservation Areas
- Closed to Public Access
- Conservation Easements

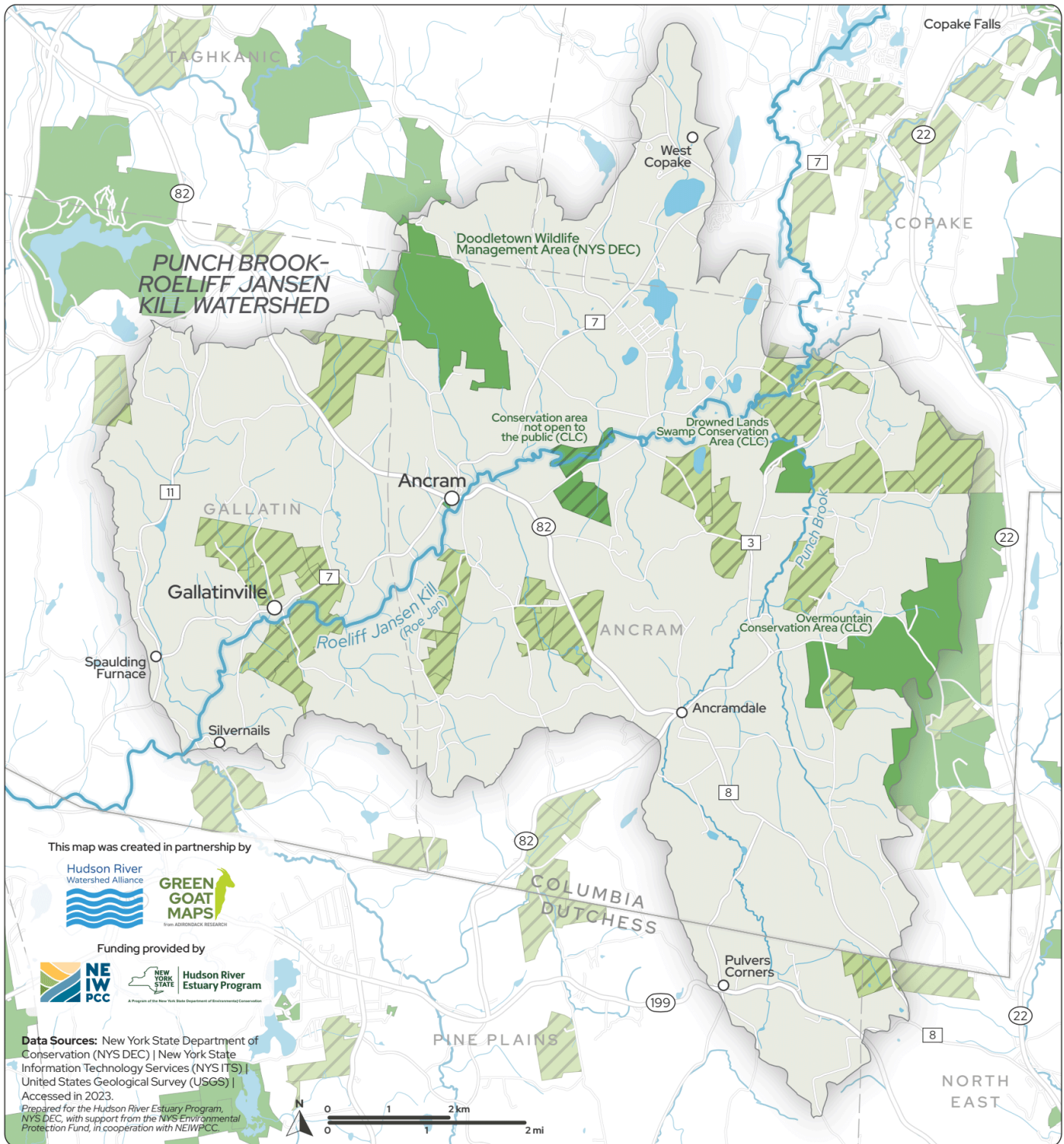


Figure 14. Protected Lands in the Punch Brook-Roeliff Jansen Kill watershed.

Built Environment

The Punch Brook-Roeliff Jansen Kill watershed is primarily rural, with large areas of forest, agriculture, and wetlands, interspersed by low density development (Table 6, Figure 9). The watershed also includes denser hamlets, especially in Ancram, along with industrial land uses.

Figure 15 shows the distributed development in the watershed, as well as the more intensive land and water uses. The Punch Brook-Roeliff Jansen Kill watershed contains one transfer facility, three inactive landfills, eight petroleum bulk storage facilities, one chemical bulk storage facility, and seven permitted and reclaimed mines. Of particular note in the built environment is the Schweitzer-Mauduit paper mill, located on the banks of the Roeliff Jansen Kill in Ancram. Originally founded as an iron works in 1743, it became a paper mill in 1854, and is the longest continuously operating mill in New York State ([Masters 1990](#)). The Schweitzer-Mauduit corporation's global headquarters are in Luxembourg.

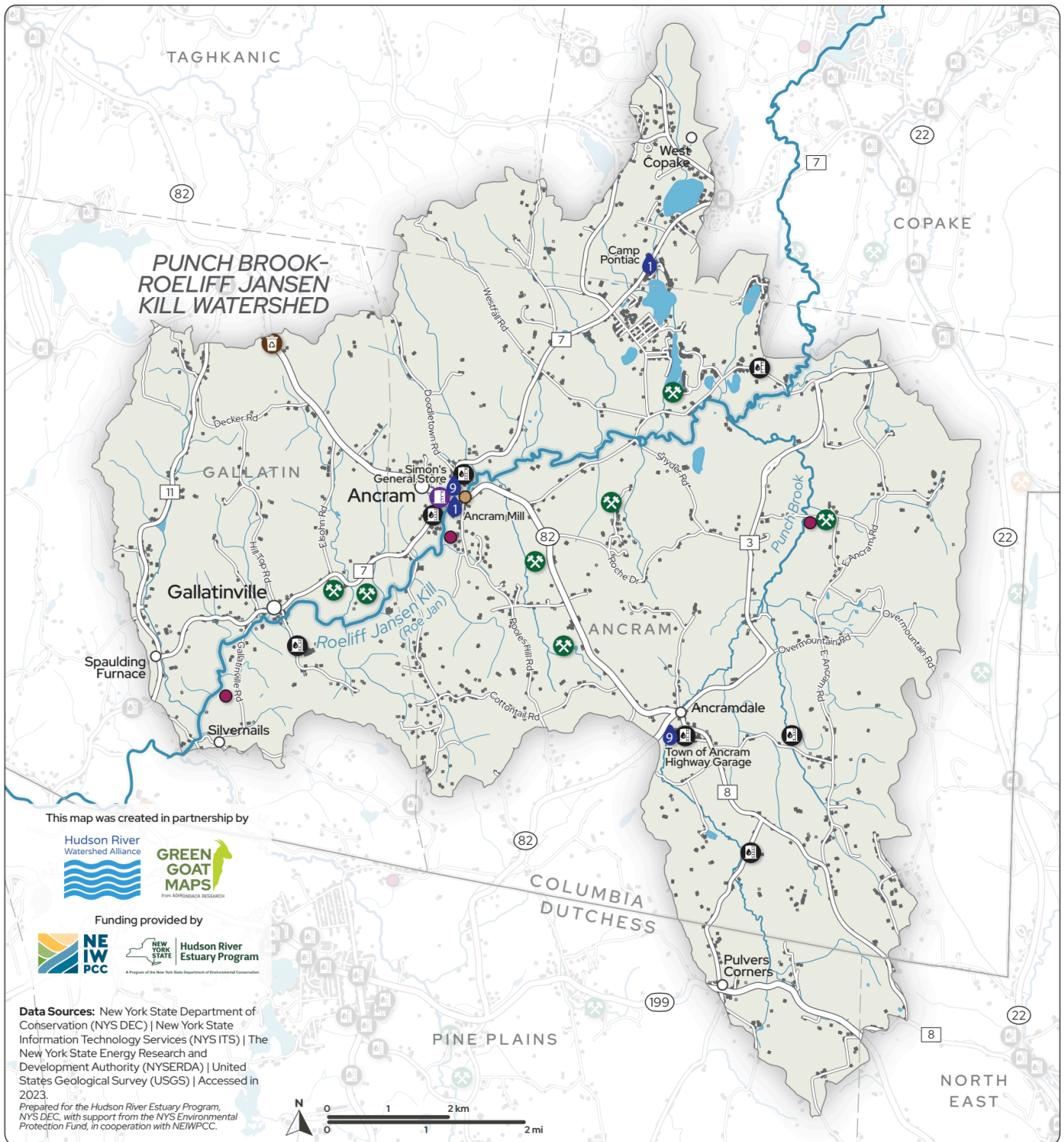
The watershed's solid waste facilities, petroleum bulk storage, chemical bulk storage, permitted, and reclaimed mines are described in this section. For more information on wastewater facilities shown in Figure 15, see the section on [Wastewater](#) under Waters of the Punch Brook-Roeliff Jansen Kill watershed. For more information on the industrial stormwater permit shown on the map, see the section on [Stormwater](#) under Waters of the Punch Brook-Roeliff Jansen Kill watershed.

For more information about watershed's transfer facilities, inactive solid waste landfills, petroleum bulk storage, chemical bulk storage, permitted and reclaimed mines, wastewater facilities (SPDES), and Multi-Sector General Permits (MSGP), use the [DECinfo Locator](#), an interactive tool that maps and provides public access to NYS DEC documents and public data about permits and environmental quality. The most up-to-date information can be accessed through the DECinfo Locator.

For facilities' enforcement and compliance information, see the EPA's [Enforcement and Compliance History Online \(ECHO\)](#).

BUILT ENVIRONMENT OF THE PUNCH BROOK- ROELIFF JANSEN KILL WATERSHED

- Petroleum Bulk Storage
- Chemical Bulk Storage
- Transfer Facility
- Wastewater Facilities (Digit corresponds to WCS Class)
- Industrial Stormwater Permit
- Inactive Solid Waste Landfills
- Permitted Mine
- Reclaimed Mine
- Building Footprint
- State Road
- County Road
- Other Road



This map was created in partnership by



Funding provided by



Data Sources: New York State Department of Conservation (NYS DEC) | New York State Information Technology Services (NYS ITS) | The New York State Energy Research and Development Authority (NYSERDA) | United States Geological Survey (USGS) | Accessed in 2023.
Prepared for the Hudson River Estuary Program, NYS DEC, with support from the NYS Environmental Protection Fund, in cooperation with NEIWPCC.

Figure 15. Built Environment of the Punch Brook-Roeliff Jansen Kill watershed.

Solid Waste Facilities

The Punch Brook-Roeliff Jansen Kill watershed has one transfer facility. A [transfer facility](#) is a facility that receives, consolidates, and transports waste to a subsequent facility for processing, treatment, further transfer, or disposal. The [Gallatin Convenience Station](#) (Authorization Number: 11R34) is owned by Columbia County, and located within the Town of Ancram at State Route 82, Gallatin, NY 12502. The facility receives mixed municipal solid waste (residential, institutional, and commercial).

Though there are no active landfills within the Punch Brook-Roeliff Jansen Kill watershed, there are three inactive landfills (Table 11). The NYS DEC's [New York State Inactive Landfill Initiative: Comprehensive Plan to Address Priority Solid Waste Sites for Potential Impacts on Drinking Water Quality](#) (2022) ranks facilities across New York State to prioritize next steps, with an emphasis on understanding impacts of emerging contaminants, including per- and polyfluoroalkyl substances (PFAS) and 1,4-dioxane. Table 11 includes the rankings and recommendations for facilities in this watershed. Investigations for sites ranked over 45, including the inactive landfill at Ancram Mill-Kimberly Clark (Schweitzer-Mauduit), have already begun. Investigations for sites ranked 40-42, including the Gallatin SLF and Ancram Landfill, are recommended to begin in 2024.

Table 11. Inactive solid waste landfills in the Punch Brook-Roeliff Jansen Kill watershed.

Facility Name (owner)	Municipality	Solid Waste ID	Ranked Score in 2022 DEC Report	Recommendation/Status in 2022 DEC Report
Gallatin SLF (T)	Town of Gallatin	11S24/34	40	Initiate investigation in 2024
Ancram Mill-Kimberly Clark (Schweitzer-Mauduit)	Town of Ancram	11N01	48	Site-specific Work Plan in Development; Recommendations Pending Results of Groundwater Investigation
Ancram Landfill (T)	Town of Ancram	11S20, 11D03	42	Initiate investigation in 2024

Source: Inactive Solid Waste Landfills

Publisher: NYS DEC

Publication Year: last updated 1/24/23; Information accessed through the DECinfo Locator.

Hazardous Substance Bulk Storage Facilities

NYS DEC manages [hazardous substance bulk storage programs](#) for the safe storage and handling of petroleum, hazardous substances/chemicals, and liquefied natural gas, including requirements, inspection, and enforcement procedures. The Petroleum Bulk Storage program

applies to properties that have: 1) one or more tank systems designed to store a combined capacity of more than 1,100 gallons or more of petroleum in aboveground and/or underground storage tanks or 2) one or more underground tank systems designed to store 110 or more gallons of petroleum, except for tank systems that are specifically exempted. The Petroleum Bulk Storage facilities within the Punch Brook-Roeliff Jansen Kill watershed are listed in Table 12.

All above ground and underground tank systems designed to store used oil, regardless of size, must be registered with DEC and managed with applicable regulations for storage and handling of petroleum.

Table 12. Petroleum Bulk Storage Facilities within the Punch Brook-Roeliff Jansen Kill watershed.

Petroleum Bulk Storage Site Name	Site Number	Municipality	Facility Type	Number of Tanks
West Copake Outpost - D P W (Columbia County DPW)	4-442372	Town of Ancram	Other	2 in service 1 closed - removed
Ancram Garage	4-163503	Town of Ancram	Retail Gasoline Sales	2 closed - removed
Crest Lane Farm	4-085960	Town of Ancram	Farm	2 closed - removed
Cross Country Farm	4-085952	Town of Ancram	Farm	2 in service
Town of Ancram	4-013129	Town of Ancram	Municipality (Incl. wastewater treatment plants, utilities, swimming pools, etc.)	2 in service 7 closed - removed
Schweitzer-Mauduit International, Inc.	4-133442	Town of Ancram	Manufacturing (Other than chemical)/ Processing	5 in service 1 closed - removed
Ancram Construction Corp. / Stickle Electric	4-601479	Town of Ancram	Other	5 in service 1 closed - in place
Mill Hill Farm, Inc.	4-600044	Town of Gallatin	Farm	4 closed - removed 6 tanks converted to non-regulated use

Source: Petroleum Bulk Storage Facilities

Publisher: NYS DEC

Publication Year: updated daily, accessed 12/18/22; Information accessed through the DECinfo Locator.

NYS DEC’s Chemical Bulk Storage program applies to properties that store a hazardous substance (a substance listed in [6 NYCRR Part 597](#)) in an aboveground storage tank larger than 185 gallons, any size underground storage tank, or in a container that can store 1,000 kg or more for a period of 90 consecutive days or more.

There is one Chemical Bulk Storage facility within the Punch Brook-Roeliff Jansen Kill watershed, listed in Table 13.

Table 13. Chemical Bulk Storage Facilities within the Punch Brook-Roeliff Jansen Kill watershed.

Chemical Bulk Storage Site Name	Site Number	Municipality	Facility Type	Database Record	Number of Tanks
Mative Holdings Inc.	4-000081	Town of Ancram	Manufacturing (Other than Chemical)/Processing	Record	Tank information withheld

Source: Chemical Bulk Storage Facilities

Publisher: NYS DEC

Publication Year: updated daily, accessed 12/18/22; Information accessed through the DECinfo Locator.

Permitted and Reclaimed Mines

There are seven permitted and reclaimed mines within the Punch Brook-Roeliff Jansen Kill watershed (Table 14). The majority of these mines extracted sand and gravel, with one clay mine. Four mines have been reclaimed to agricultural cropland, two to meadow/grassland, and one to another type of reclamation. [NYS DEC Division of Mineral Resource provides permits for mines](#) and approves mining and reclamation plans, which specify how mining will take place and how the affected land will be returned to a productive use.

For more information on mineral resources within the Punch Brook-Roeliff Jansen Kill watershed, see the [Geology](#) section and map of [Surficial Geology](#) (Figure 7).

Table 14. Permitted and reclaimed mines within the Punch Brook-Roeliff Jansen Kill watershed.

Mine Name	Mine ID	Municipality	Status	Commodity	Maximum Acreage Affected	Reclamation Type
Fair-Rose Pit	40418	Town of Ancram	Reclaimed	Sand and Gravel	3.00	Agricultural Cropland
Rothvoss/ Acram Landfill Borrow Areas (Columbia County Dept of Solid Waste)	40634	Town of Ancram	Reclaimed	Clay	5.00	Other
Rothvoss Roche Lane Pit	40491	Town of Ancram	Reclaimed	Sand and Gravel	4.00	Meadow / Grass Land
Miller Mine	40502	Town of Ancram	Reclaimed	Sand and Gravel	16.00	Agricultural Cropland (6.00 acres)
Bryant Mine NYS 82	40537	Town of Ancram	Reclaimed	Sand and Gravel	60.00	Meadow / Grass Land (29.90 acres)
(unnamed)	40480	Town of Gallatin	Reclaimed	Sand and Gravel	16.00	Agricultural Cropland
Dencinjo Gravel Mine/ Sigler Mine	40666	Town of Gallatin	Reclaimed	Sand and Gravel	26.00	Agricultural Cropland

Source: Permitted and Reclaimed Mines

Publisher: NYS DEC

Publication Year: updated daily, accessed 12/18/22; Information accessed through the DECinfo Locator.

Waters of the Punch Brook-Roeliff Jansen Kill Watershed

This section focuses on the waterbodies and watercourses within the watershed, including floodplains, aquatic habitats, water quality, and water infrastructure.

The Punch Brook-Roeliff Jansen Kill watershed includes 277 acres of waterbodies and 111 miles of streams. In addition to the Punch Brook and Roeliff Jansen Kill, other major waterbodies within the watershed include Upper Rhoda Pond, Lower Rhoda Pond, Long Pond, Miller Pond, and Dewitt Pond (Figure 16).

Floodplains and Flooding

Floodplains are defined as any land areas susceptible to being inundated by floodwaters from any source. The Federal Emergency Management Agency (FEMA) has mapped approximate [“high risk” floodplains](#), based on flood frequency according to the extent of land expected to have a 1% or greater chance of being inundated in any given year.

Figure 16 shows the 1% Special Flood Hazard Area, often referred to as the “100-year floodplain,” within the Punch Brook-Roeliff Jansen Kill watershed. Flood insurance is mandatory in these zones for people with mortgages. While these areas have a 1% annual chance of flooding in any given year, they have a 26% chance of flooding over the life of a 30-year mortgage. In Columbia County, floodplains were digitized into a dataset derived from FEMA’s Flood Insurance Rate Maps (FIRMs). FEMA has not yet released Digital Flood Insurance Rate Maps (DFIRMs) for Columbia County, but they are available for Dutchess County.

Mapped floodplains are located along the Punch Brook and Roeliff Jansen Kill stream corridors (Figure 16). However, known flood-prone areas may not be included on floodplain maps, flooding is possible in areas outside of designated floodplains, and floodplain designations may change over time as new information becomes available.

The [Columbia County Multi-Jurisdictional Hazard Mitigation Plan](#) (2015, updated 2018) is a multi-jurisdictional plan that included Columbia County, Town of Ancram, Town of Copake, Town of Gallatin, and Town of Taghkanic. The [Dutchess County Hazard Mitigation Plan](#) (2016) included Dutchess County, Town of North East, and Town of Pine Plains. Both Hazard Mitigation Plans identified coastal storms, flooding, and severe storms as significant hazards across Columbia and Dutchess counties. The plans also include flood vulnerability analysis, repetitive flood losses by municipality, and recommended actions to mitigate flooding.

Table 15. County Hazard Mitigation Plan Community Profiles within the Punch Brook-Roeliff Jansen Kill watershed.

Municipality	Hazard Mitigation Plan Community Profile
Town of Ancram ¹	Community Profile
Town of Copake ¹	Community Profile
Town of Gallatin ¹	Community Profile
Town of Taghkanic ¹	Community Profile
Town of North East ²	Community Profile
Town of Pine Plains ²	Community Profile

¹Source: Columbia County Multi-Jurisdictional Hazard Mitigation Plan
Publication Year: 2018

²Source: Dutchess County Hazard Mitigation Plan
Publication Year: 2016

Riparian Areas

Riparian areas are lands along the edges of rivers, streams, lakes, and other waterbodies that have a large influence on water quality, stream dynamics, and ecosystem health. They mark the transition zone between aquatic and terrestrial ecosystems. A riparian buffer, also known as a stream buffer, is the vegetated area between a waterbody and human activity. Healthy buffers with native trees, shrubs, and grasses help reduce water pollution, reduce erosion and flooding damage, and provide habitat for fish and other wildlife.

The New York Natural Heritage Program has mapped riparian areas (called riparian buffers in these materials) as part of the [Statewide Riparian Opportunities Assessment](#) to highlight important streamside areas that influence stream dynamics and health. Figure 16 shows mapped riparian buffer areas in the Punch Brook Roeliff Jansen Kill watershed. The riparian buffer areas were mapped around streams through modeling based on digital elevation data, known wetlands, and estimates for the 50-year flood height. They vary in their width, taking into account surrounding hydrology. They provide a starting point to inform land use strategies and stream protection, but field visits are necessary to verify conditions. Note that these mapped riparian buffer areas may or may not be vegetated. More information is available in the [New York State Riparian Opportunity Assessment Report](#) (2018).

There have been eight riparian buffer restoration projects on three private properties in the Punch Brook-Roeliff Jansen Kill watershed through the [Hudson Estuary Trees for Tribs Program](#). Plantings took place between 2013 and 2019, with 35 volunteers planting 706 total trees, shrubs, and live stakes.

FLOODPLAIN AND RIPARIAN AREAS OF THE PUNCH BROOK-ROELIFF JANSEN KILL WATERSHED

■ - 1% Special Flood Hazard Area
■ - Riparian Buffer

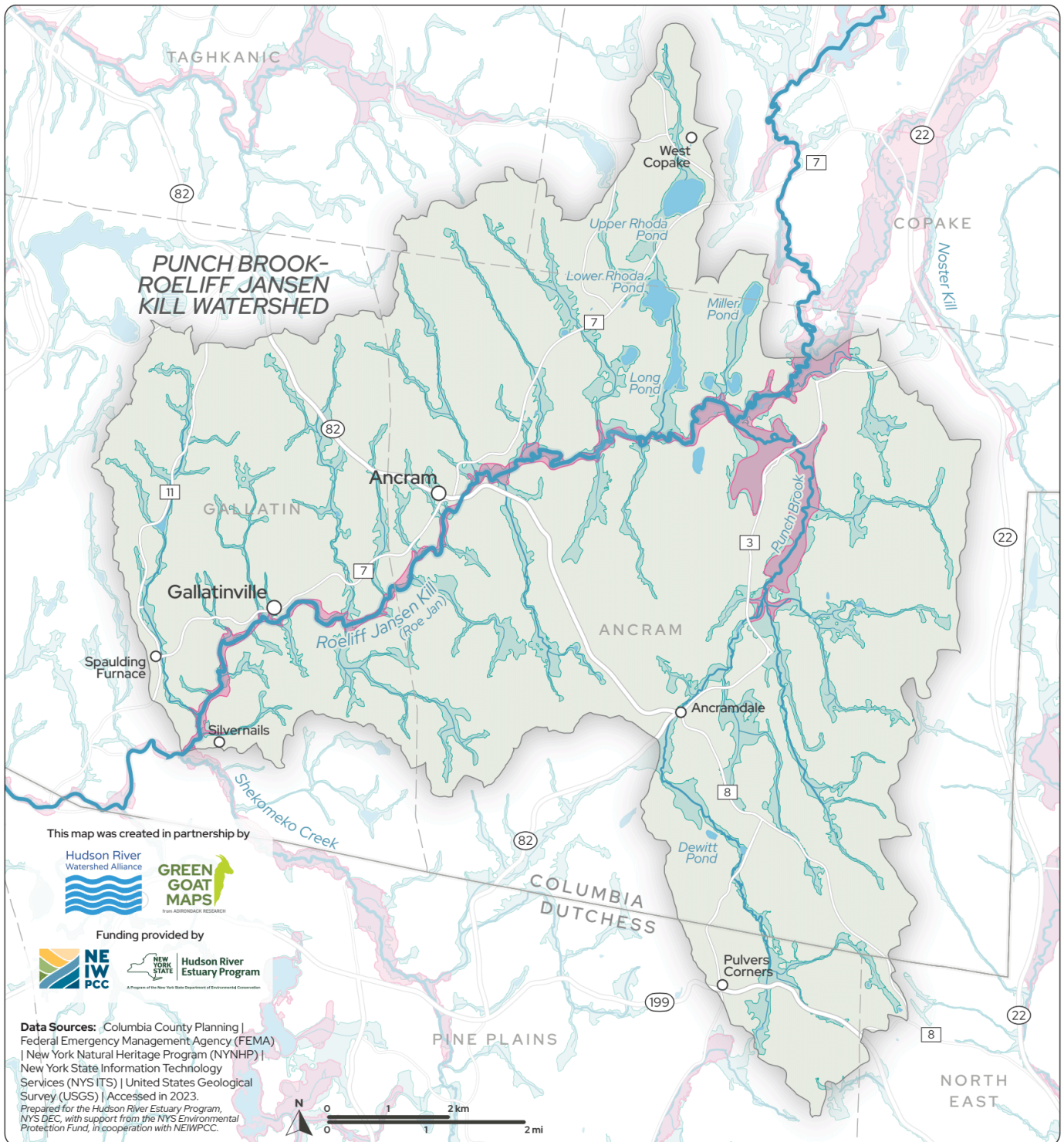


Figure 16. Floodplains and Riparian Areas in the Punch Brook-Roeliff Jansen Kill watershed.

Aquifers & Water Use

Aquifers & Groundwater

Aquifers are saturated underground areas that can yield usable amounts of water to wells and springs. Groundwater, which includes aquifers and other underground water, is particularly important to maintain flows of water into rivers and streams during drier periods. The majority of water for used domestic, business, and industrial purposes in the watershed comes from groundwater.

Figure 17 shows both unconsolidated aquifers and wells mapped by NYS DEC and NY Rural Water Association. Aquifers in New York State were coarsely mapped by the United States Geological Survey in partnership with NYS DEC. Because the scale of the original aquifer maps was 1:250,000, they indicate only the general location of unconsolidated aquifers; they are not intended for detailed site evaluations. NYS DEC requires water well drillers to submit completion reports documenting where wells have been drilled, specifications, and any subsequent work. Mapped well locations are generally accurate to the parcel scale but may not represent the exact location on the property.

NY Rural Water Association also mapped unconsolidated aquifers and water wells for specific towns in Columbia County, including Ancram, Copake, and Taghkanic. Figure 17 includes mapped wells that are available in GIS, and does not include all wells within the Punch Brook-Roeliff Jansen Kill watershed.

Several municipalities have mapped groundwater and developed groundwater protection plans in partnership with New York Rural Water Association. The [Groundwater Protection Plan for the Town of Ancram](#) (2008) noted that over 90 percent of homes and businesses in Ancram use bedrock wells for drinking water. Over 70 percent of households in Ancram reported water quality problems, largely hard water resulting from wells in carbonate rocks and odor problems from sulfide minerals in the Walloomsac Formation (Winkley 2008).

The [Town of Copake Groundwater Resources Study and Protection Plan](#) (2009) found that most of the town had density below recommended levels to prevent excess nitrate loading and depletion of streamflow. Both towns' Groundwater Protection Plans include maps of areas with high hydrogeologic sensitivity and descriptions of groundwater yields. Bedrock geology in the Punch Brook-Roeliff Jansen Kill watershed is mapped in [Figure 6](#).

AQUIFERS AND WATER USE OF THE PUNCH BROOK-ROELIFF JANSEN KILL WATERSHED

- Unconsolidated Aquifers Mapped by NY Rural Water Association
- Unconsolidated Aquifers Mapped by NYS DEC
- Large Water Withdrawals (> 100,000 gpd)
- Wells Mapped by NY Rural Water Association
- Wells Mapped by NYS DEC

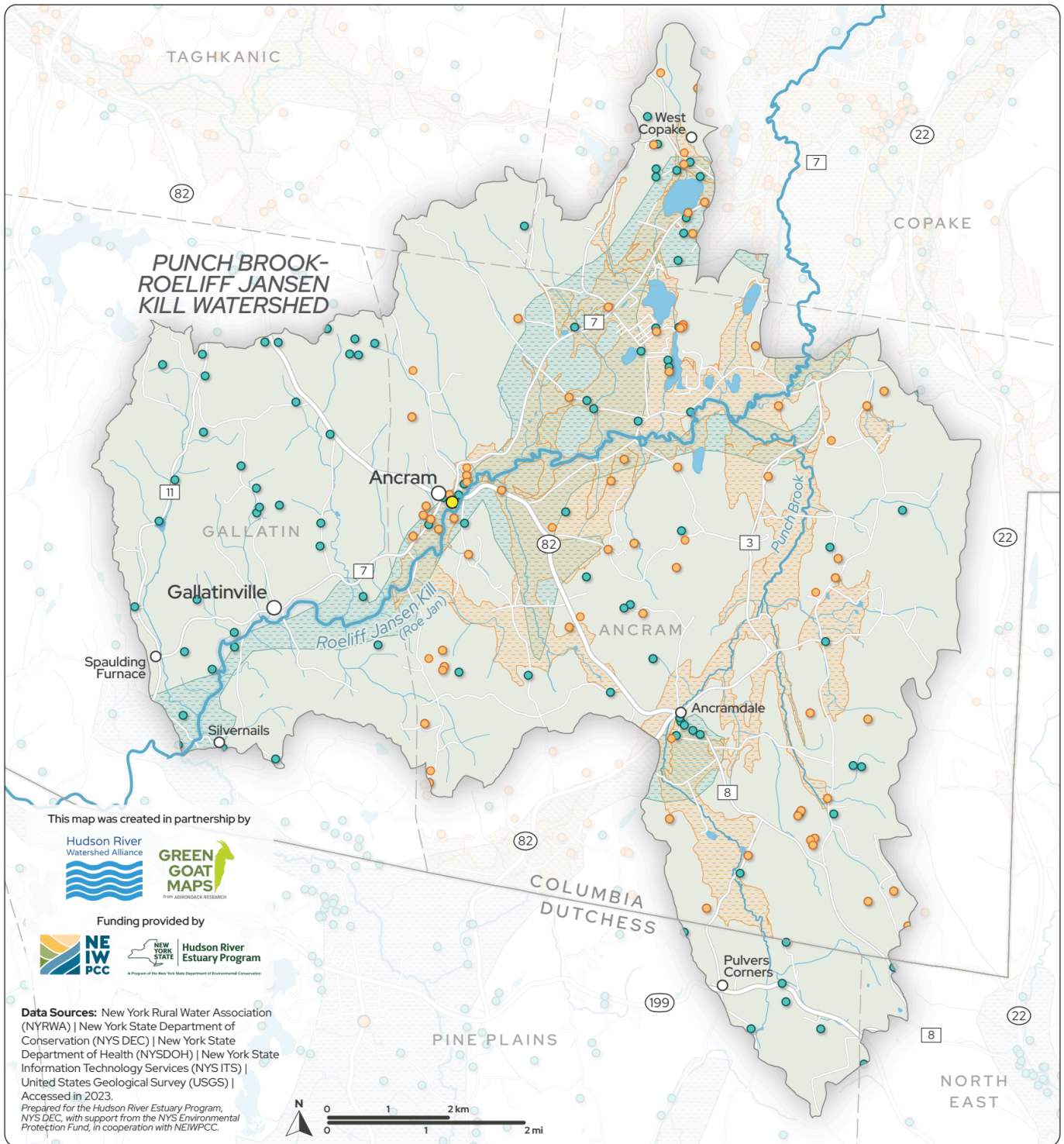


Figure 17. Aquifers and water use in the Punch Brook-Roeliff Jansen Kill watershed.

Large Water Withdrawals

New York State’s [Water Resources Law](#) requires all non-agricultural water withdrawal systems with the capacity to withdraw 100,000 gallons per day or more to obtain a Water Withdrawal Permit. There is one Water Withdrawal Permit within the Punch Brook-Roeliff Jansen Kill watershed (Figure 17). Schweitzer-Mauduit International, Inc. in Ancram withdraws both groundwater via wells and surface water from the Roeliff Jansen Kill for industrial use (Table 16). Based on the [2021 Water Withdrawal Reporting Form](#), average day withdrawal was 374,937 gallons per day, and maximum day withdrawal was 639,004 gallons per day.

Table 16. Water Withdrawal Permits within the Punch Brook-Roeliff Jansen Kill watershed.

Facility Name	Sources	Document Folder
Schweitzer-Mauduit International, Inc.	Roeliff Jansen Kill: S - Stream or River; Max Rate (Source Capacity): 2.0 million gallons per day Well Number 2: BW - Bedrock Well; Max Rate (Source Capacity): 7.5 gallons per minute WWTP Well: BW - Bedrock Well; Max Rate (Source Capacity): 6.0 gallons per minute	Document folder

Source: Water Withdrawal Annual Reports

Publisher: NYS Department of Environmental Conservation

Publication Year: updated annually, last updated 12/15/22; Information accessed through the DECinfo Locator.

Drinking Water

All residents of the Punch Brook-Roeliff Jansen Kill watershed use groundwater as their drinking water supply. The majority of drinking water within the watershed comes from private wells. Owners of private wells are responsible for ensuring that their water is safe from contaminants; the New York State Department of Health regulations that protect public drinking water systems do not apply to privately-owned wells.

The Punch Brook-Roeliff Jansen Kill watershed also includes nine Public Water Systems. A Public Water System is a regulated entity that provides water to the public for human consumption. These systems provide drinking water to at least five service connections or serve an average of at least 25 people for 60 days per year. These systems are categorized and regulated by the New York State Department of Health.

The Public Water System type is based on the number of people served, the water source, and whether or not it serves the same people year-round. Community systems provide drinking water to the same customers year-round. The Punch Brook-Roeliff Jansen Kill watershed contains one community water system, Long Lake Association, serving 49 people (Table 17). The Punch Brook-Roeliff Jansen Kill watershed contains seven transient non-community systems,

servicing approximately 1,500 people total (Table 17). These types of systems serve different people for more than six months out of the year. Summer camps, such as Camp Pontiac and Camp Anne, have Public Water Systems that are primarily active in the summer months. The watershed also includes one non-transient non-community system at the Schweitzer-Mauduit International, Inc. paper mill, which serves 100 people (Table 17). Non-transient non-community systems serve the same people more than six months of the year. For more information on system types, see the [New York State Department of Health's Drinking Water Program: Frequently Asked Questions](#). Public water system contacts are available through the New York State Department of Health's [Contact Report](#).

Table 17. Active Public Water Systems (PWS) within the Punch Brook-Roeliff Jansen Kill watershed.

PWS Name	PWS ID	PWS Type	Primary Source	Municipality	Population Served	Number of Facilities
LONG LAKE ASSOCIATION	NY1030187	Community water system	Groundwater	ANCRAM	49	5
ANCRAM HOTEL	NY1015290	Transient non-community system	Groundwater	ANCRAM	50	4
THE POND RESTAURANT	NY1006443	Transient non-community system	Groundwater	ANCRAM	275	4
CAMP PONTIAC	NY1030032	Transient non-community system	Groundwater	COPAKE	900	6
CAMP ANNE	NY1030036	Transient non-community system	Groundwater	ANCRAM	200	4
JACK IS COOKING/ HERONDALE FARM	NY1030268	Transient non-community system	Groundwater	ANCRAM	25	4
FARMERS WIFE	NY1030082	Transient non-community system	Groundwater	ANCRAM	25	1
ANCRAM LITTLE STORE	NY1030114	Transient non-community system	Groundwater	ANCRAM	25	5
SCHWEITZER-MAUDUIT INTL, INC.	NY1010737	Non-Transient non-community system	Groundwater	ANCRAM	100	3

Source: Water System Summary

Publisher: US Environmental Protection Agency (EPA) Safe Drinking Water Information System (SDWIS)

Publication Year: 2024

More information on public water systems, including violations, is available by searching the public water system name through the US EPA [Safe Drinking Water Information System \(SDWIS\)](#) and the US EPA [Enforcement and Compliance History Online \(ECHO\)](#) website.

Aquatic Habitats

Important Areas

Most of the stream network in the Punch Brook-Roeliff Jansen Kill watershed has significant aquatic habitat (Figure 18), based on Important Area data from the [New York Natural Heritage Program](#). Important areas are modeled and mapped based on actual locations of rare species or ecosystems and the life histories and habitats of the species or species group and the community type's size and natural ecological processes.

Important areas for coldwater habitat make up the largest extent of significant aquatic habitat in the watershed in Figure 18. These areas are important for trout and other important coldwater fish species, and are based on NYS DEC Bureau of Fisheries surveys and New York Natural Heritage Program modeling.

Known Important Areas for Migratory Fish include areas important for sustaining known populations of American eel, which travel from the Roeliff Jansen Kill to the Sargasso Sea in the Atlantic Ocean via the Hudson River Estuary to spawn. These data are also based on NYS DEC fish surveys and New York Natural Heritage Program modeling.

Figure 18 also has a Known important Area for Rare Aquatic Animals in the downstream-most portion of the watershed. For more information on the specific rare animals found in the watershed, request data from the [New York Natural Heritage Program](#).

Although the Important Areas are based on best available information, they do not represent a comprehensive inventory of all important aquatic species or habitats. For more information about how Important Areas were developed and can be used, see the [Natural Heritage Important Areas Fact Sheet](#). For more information about the location and extent of important areas, see the [Hudson Valley Natural Resources Mapper](#).

Trout Fishing

The NYS DEC stocks brown trout within several reaches of the Roeliff Jansen Kill, including one within the Punch Brook-Roeliff Jansen Kill watershed. This stocked reach extends from the Ancram Dam upstream to the Robinson Pond Dam. Stocking takes place during the second week of April, with a total number of stocked fish of 1,813 in 2022.

There is public access for trout fishing along the Roeliff Jansen Kill, located just upstream of the confluence with the Punch Brook; see the [NYS DEC Roeliff Jansen Kill Public Fishing Rights Maps](#) (no date). Public Fishing Rights are permanent easements purchased by the NYS DEC from willing landowners, giving anglers the right to fish and walk along the stream bank. This right is for the purpose of fishing only. For more information on fish stocking and public fishing rights, see NYS DEC's [Trout Stream Fishing Map User Guide](#).

SIGNIFICANT AQUATIC HABITATS OF THE PUNCH BROOK- ROELIFF JANSEN KILL WATERSHED

Areas Important to the Health of:

-  - Rare Aquatic Animals
-  - Migratory Fish
-  - Coldwater Fish (Including Brook Trout)

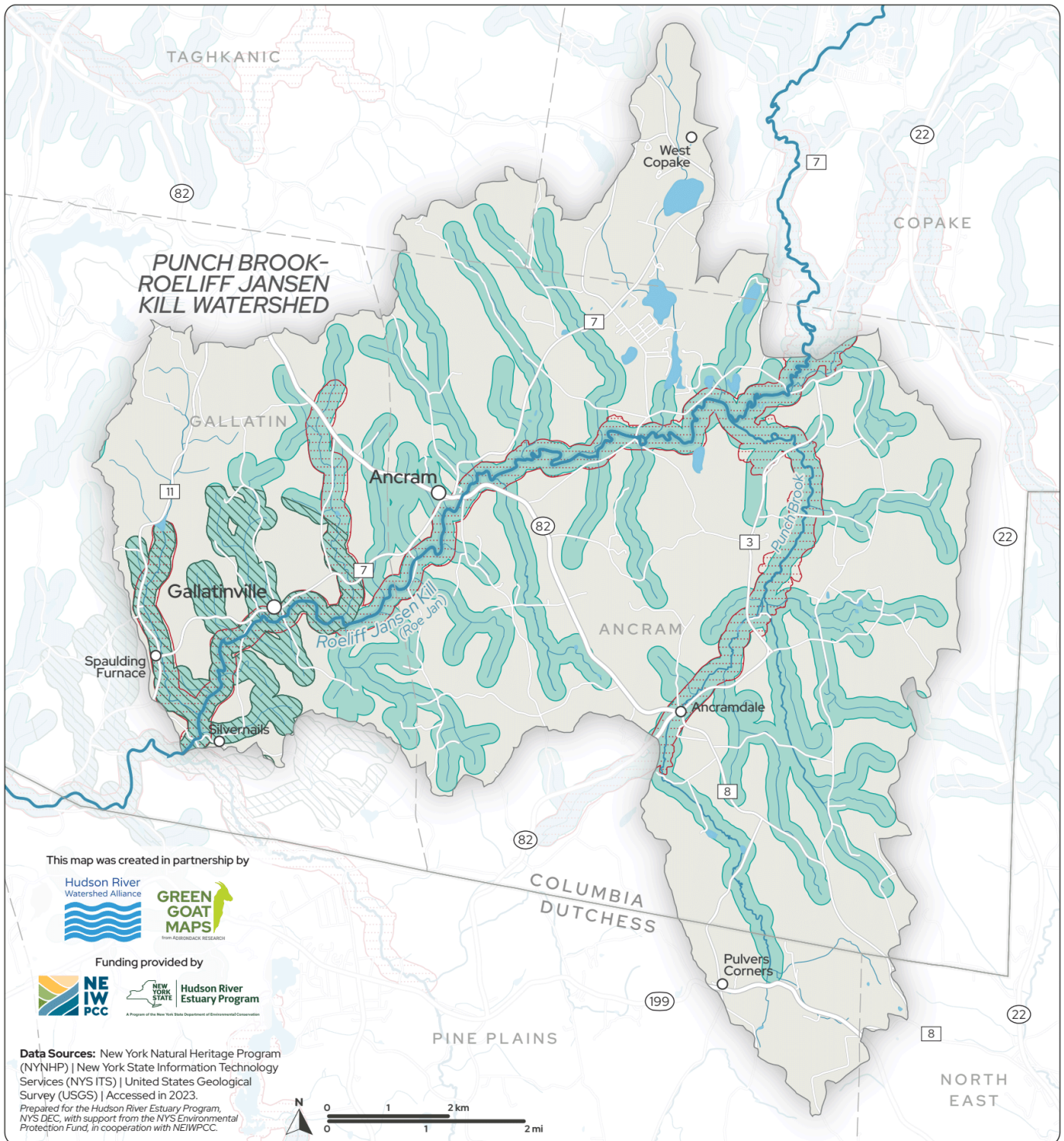


Figure 18. Significant Aquatic Ecosystems in the Punch Brook-Roeliff Jansen Kill watershed.

Dams

Dams are in-stream barriers that hold back water, often forming a pond or other waterbody. Dams can limit the habitat and range of aquatic species and other animals that use stream corridors, acting as barriers to their movement up- and downstream. Dams can also impact flooding, stream channel dynamics, and water quality.

There are eight mapped dams within the Punch Brook-Roeliff Jansen Kill watershed (Figure 19, Table 18), based on the New York State Inventory of Dams. The Ancram Mill dam, at the Schweitzer-Mauduit International paper mill, is located on the Roeliff Jansen Kill. Two dams are located on the Punch Brook, with five additional dams on smaller waterbodies and ponds (Table 18). Many existing dams are not mapped in GIS. Assessments done in two Hudson River watershed sub-watersheds indicate that dam inventories may underestimate the true number of dams by 80-96% (Buchanan et al. 2022).

The New York State Inventory of Dams uses size and hazard thresholds to define and track dams. The Hazard Description indicates the downstream hazard potential of a dam failure. The Mill Pond Dam on the Punch Brook in Ancram and the H T Vogel Pond Dam in Gallatin are both considered Medium Hazard Dams, with the rest of the dams in the watershed considered Low Hazard (Table 18). More information on dam safety is available through the NYS DEC's [Dam Safety Section](#).

More information on restoring free-flowing rivers in the Hudson River watershed for habitat connectivity, including the impacts of both dams and road-stream crossings, is available through the NYS DEC [Hudson River Estuary Program](#) and the [New York State Water Resources Institute at Cornell University](#).

Table 18. Dams within the Punch Brook-Roeliff Jansen Kill watershed.

Dam Name	Waterbody Impounded	State ID / Federal ID	Municipality	Last Condition Rating*	Dam Height *	Construction Type*	Hazard Description*
Robert Gilmore Pond Dam	Unknown	228-4064 NY13808	Town of Ancram	Not rated	10	RE - Earth	Low Hazard Dam
T Roger Craig Pond Dam	Unknown	228-4075 NY13809					
Niver Homestead Farm Pond Dam	Punch Brook	229-1058 NY13830	Town of Ancram	Not rated	9	CN - Concrete Gravity; RE - Earth	Low Hazard Dam
Mill Pond Dam	Punch Brook	228-4792 NY13818	Town of Ancram	Not rated	10	MS - Masonry; RE - Earth	Intermediate Hazard Dam
G Snyder Wildlife Marsh Dam	Unknown	228-2871 NY00403	Town of Ancram	Not rated	7	RE - Earth	Low Hazard Dam
Ancram Mill Dam ⁴	Roeliff Jansen Kill	228-0940 NY13792	Town of Ancram	Not rated	18	MS - Masonry; CN - Concrete Gravity	Low Hazard Dam
Pelkington Pond Dams A & B	Unknown	228-3564 NY13801	Town of Gallatin	Not rated	11	RE - Earth	Low Hazard Dam
H T Vogel Pond Dam	Unknown	228-3612 NY01193	Town of Gallatin	No deficiencies noted	17	RE - Earth	Intermediate Hazard Dam

Source: DEC Dam Inventory

Publisher: NYS Department of Environmental Conservation

Publication Year: 2015; Information accessed through the Hudson Valley Natural Resource Mapper.

*Source: NY Dam Inventory

Publication Year: updated annually, last updated 3/24/22; Information accessed through the DECinfo Locator.

⁴ This dam is referred to as the Ancram Mill Dam in the New York State Inventory of Dams, and is located at the Schweitzer-Mauduit International, Inc. paper mill.

DAMS AND CULVERTS OF THE PUNCH BROOK-ROELIFF JANSEN KILL WATERSHED

Culvert Capacity

- - Not Modeled
- - No Storm
- - 1 Year Storm
- - 2 Year Storm
- - 5 Year Storm
- - 10 Year Storm
- - 50 Year Storm
- - 500 Year Storm

Aquatic Passability (by Barrier Status)

- - Not Assessed
- - Severe Barrier
- - Moderate Barrier
- - Significant Barrier
- - Minor Barrier
- - Insignificant Barrier
- - Dams

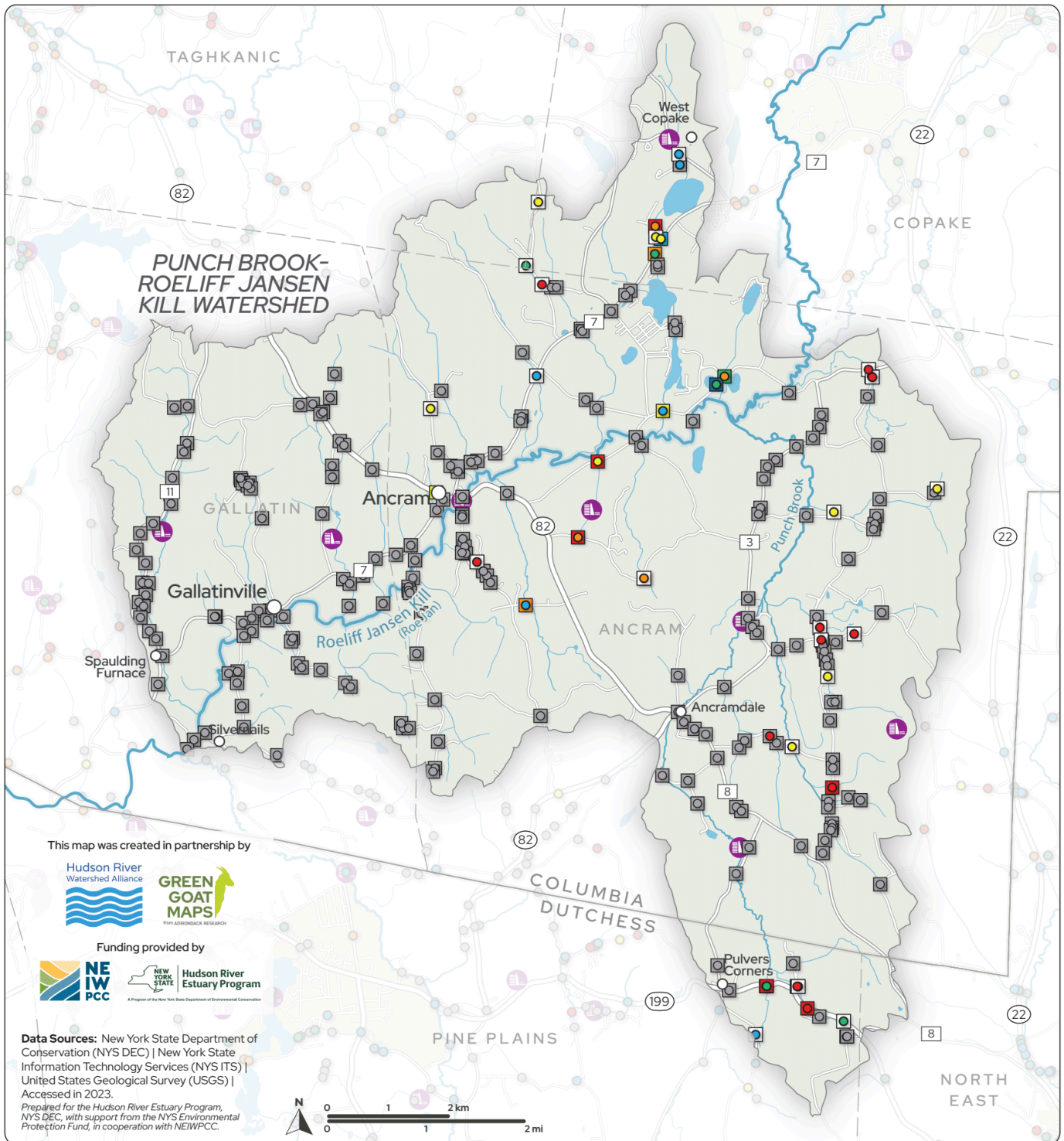


Figure 19. Dams and culverts in the Punch Brook-Roeliff Jansen Kill watershed.

Road-Stream Crossings

Bridges or culverts that allow roads to cross over rivers and streams have the potential to impact the flow of water or the connectivity of aquatic and streamside habitats. Bridges, open-bottomed arches, and similar structures that span the waterway and its floodplain or riparian area typically have the least impact on streams. Culverts that are undersized or improperly installed can act as barriers for aquatic organisms and increase community flood risk. More information on road-stream crossings is available through the NYS DEC Hudson River Estuary Program's [aquatic connectivity fact sheet](#) and NYS DEC's [stream crossing guidance](#).

Figure 19 shows the location and assessment status of road-stream crossings within the Punch Brook-Roeliff Jansen Kill watershed. Most road-stream crossings in the watershed are culverts (Table 19). Since 2013, the NYS DEC Hudson River Estuary Program and partners have assessed and prioritized culverts and bridges on local, county, and state roads to identify barriers to aquatic organisms and ability to pass stream flow from large storms. More details on each assessed culvert are available through the [North Atlantic Aquatic Connectivity Collaborative \(NAACC\)](#) and their [Data Center Stream Crossing Explorer](#).

Out of 280 total identified road-stream crossings within the Punch Brook-Roeliff Jansen Kill watershed, 100 have been visited in the field to assess aquatic organism passage (Table 19). Of these, 25 crossings were not accessible for assessment, and 38 sites were found to not include a road-stream crossing (Table 19). Of the 37 road-stream crossings that were assessed for aquatic organism passage, the majority were culverts (35), with an additional two bridges (Table 19).

Table 19. Road-stream crossings in the Punch Brook-Roeliff Jansen Kill watershed.

Crossing Type	Number
Unassessed	180
Inaccessible	20
Partially Inaccessible	5
No Crossing	38
Bridge	2
Culvert	34
Multiple Culverts	1
Total Assessed	37

Source: [North Atlantic Aquatic Connectivity Collaborative \(NAACC\) Data Center](#)

Publisher: North Atlantic Aquatic Connectivity Collaborative (NAACC)

Publication Year: 2015-2020

Of the 37 assessed road-stream crossings, 26 are considered moderate, significant, or severe barriers to aquatic organism passage and 11 are considered insignificant or minor barriers to aquatic organism passage and (Table 20). Aquatic organism passability descriptors are based on numeric scores for a variety of field-based criteria collected. More information is available through NAACC’s [Aquatic Connectivity - Non Tidal website](#).

Table 20. Aquatic organism passability of culverts in the Punch Brook-Roeliff Jansen Kill watershed.

Barrier Descriptor	Number	Percent
Insignificant Barrier	6	16%
Minor Barrier	5	14%
Moderate Barrier	5	14%
Significant Barrier	9	24%
Severe Barrier	12	32%
Total Assessed	37	100%

Source: [North Atlantic Aquatic Connectivity Collaborative \(NAACC\) Data Center](#)

Publisher: North Atlantic Aquatic Connectivity Collaborative (NAACC)

Publication Year: 2015-2020

Undersized culverts can also contribute to flooding. During storms, undersized or improperly installed culverts can become clogged with debris or overwhelmed, leading to road flooding, stream bank erosion, or even a washout of the whole road. Of the 180 identified culverts in the Punch Brook-Roeliff Jansen Kill watershed, 44 have been evaluated for their flow capacity using the [Cornell Culvert Model](#) (Figure 19). This model uses a culvert’s location and dimensions to determine its maximum capacity, which is compared to current and future (2050) peak stream flows. This provides an estimate of the culvert’s current and future maximum passable storm event. While the Cornell Culvert Model can be used to help prioritize culverts for replacement projects, it should not be used in place of an engineering assessment.

For more information on flooding in the Punch Brook-Roeliff Jansen Kill watershed, see the [Floodplains & Flooding](#) section.

The [Town of Ancram Road-Stream Crossing Inventory](#) (no date) details the town’s road-stream crossing assessments and prioritized town-owned road-stream crossings for improvements. Based on this data, the Town of Ancram developed designs for three road-stream crossings and replaced two high-priority crossings in the Punch Brook-Roeliff Jansen Kill watershed between 2015 and 2017. Culvert replacements on Pat’s Road and Hall Hill Road in Ancram each reconnected four miles of stream habitat for aquatic organisms. More information on this project is available in the Town of Ancram’s [Final Grant Report](#) (no date).

Water Quality

Water Quality Classifications and Standards

All waters in New York State are assigned an A, B, C, or D classification based on the “best use” of the watercourse or waterbody. These classifications determine how NYS DEC regulates activities in and near the waters.

For each class, the designated best uses are defined as:

- Class A, AA, A-S, or AA-S: water supply, primary and secondary contact recreation, and fishing
- Class B: primary and secondary contact recreation, fishing
- Class C: fishing and wildlife propagation
- Class D: fishing

For more information about the best uses designated for each classification, see the NYS DEC’s [Water Quality Standards and Classifications](#) website. The letter classifications and their best uses are described in regulation [6 NYCRR Part 701 Classifications--Surface Waters and Groundwaters](#).

Figure 20 shows waterbody classifications and trout standards in the Punch Brook-Roeliff Jansen Kill watershed. Most streams, lakes, and ponds within the watershed are Class C (Table 21, Table 22).

Classifications for individual waterbodies are available in [6 NYCRR Chapter X](#), Article 10. Lower Hudson River Drainage Basin Series, [Part 863 Drainage Basins of Streams Entering the Hudson River in Albany, Columbia, Greene and Rensselaer Counties](#). Classifications are also mapped on the NYS DEC’s [Environmental Resource Mapper](#). In situations where streams are not mapped in DEC databases, perennial streams share the classification of the receiving stream, while intermittent streams are Class D.

Waterbodies classified as A, B, or C may also have an associated standard of (T), indicating they may support trout populations, or (TS), indicating that they may support trout spawning. Because trout live in coldwater streams and lakes and depend on clean gravel for spawning, these standards affect how NYS DEC regulates the waters. For more information on fish in the Punch Brook-Roeliff Jansen Kill watershed, see the [Aquatic Habitats](#) section.

Together, the classification and standard determine which waterbodies or watercourses are regulated by New York State. Streams and waterbodies classified as C(T), C(TS), B, or A, as well as waterbodies under 10 acres located in the course of these streams, are collectively referred to as “protected” and are subject to the NYS DEC’s [Protection of Waters Program](#). This program requires a permit for disturbances to the bed or banks of protected waters. Streams and waterbodies may also have local protections outside of the state’s jurisdiction.

Within the Punch Brook-Roeliff Jansen Kill watershed, about 39% of streams (based on length) and 61% of lakes and ponds (based on waterbody area) are considered “protected” (Table 21, Table 22). Questions about waterbody classification and permits should be directed to the NYS DEC regional office.

Table 21. Stream classifications and standards in the Punch Brook-Roeliff Jansen Kill watershed.

Classification and Standard for Streams	Number of Segments	Total Stream Length (m)	Percent of each classification (based on length)
B	6	2,057.1	1.4%
C(T)	30	25,338.6	17.1%
C(TS)	36	30,183.3	20.4%
C	87	90,721.4	61.2%

*Source: DEC Stream Classification and Trout Status
 Publisher: NYS Department of Environmental Conservation
 Publication Year: 2022*

Table 22. Classifications and standards for lakes and ponds in the Punch Brook-Roeliff Jansen Kill watershed.

Classification and Standard for Lakes and Ponds	Number of Waterbodies	Total Waterbody Size (m²)	Percent of each classification (based on size)
B	2	56,703.4	60.9%
C(T)	1	221.0	0.2%
C	13	36,108.8	38.8%

*Source: DEC Stream Classification and Trout Status
 Publisher: NYS Department of Environmental Conservation
 Publication Year: 2022*

WATER CLASSIFICATIONS AND STANDARDS OF THE PUNCH BROOK- ROELIFF JANSEN KILL WATERSHED

- Class A
- Class B
- Class C
- Class C (T)
- Class C (TS)

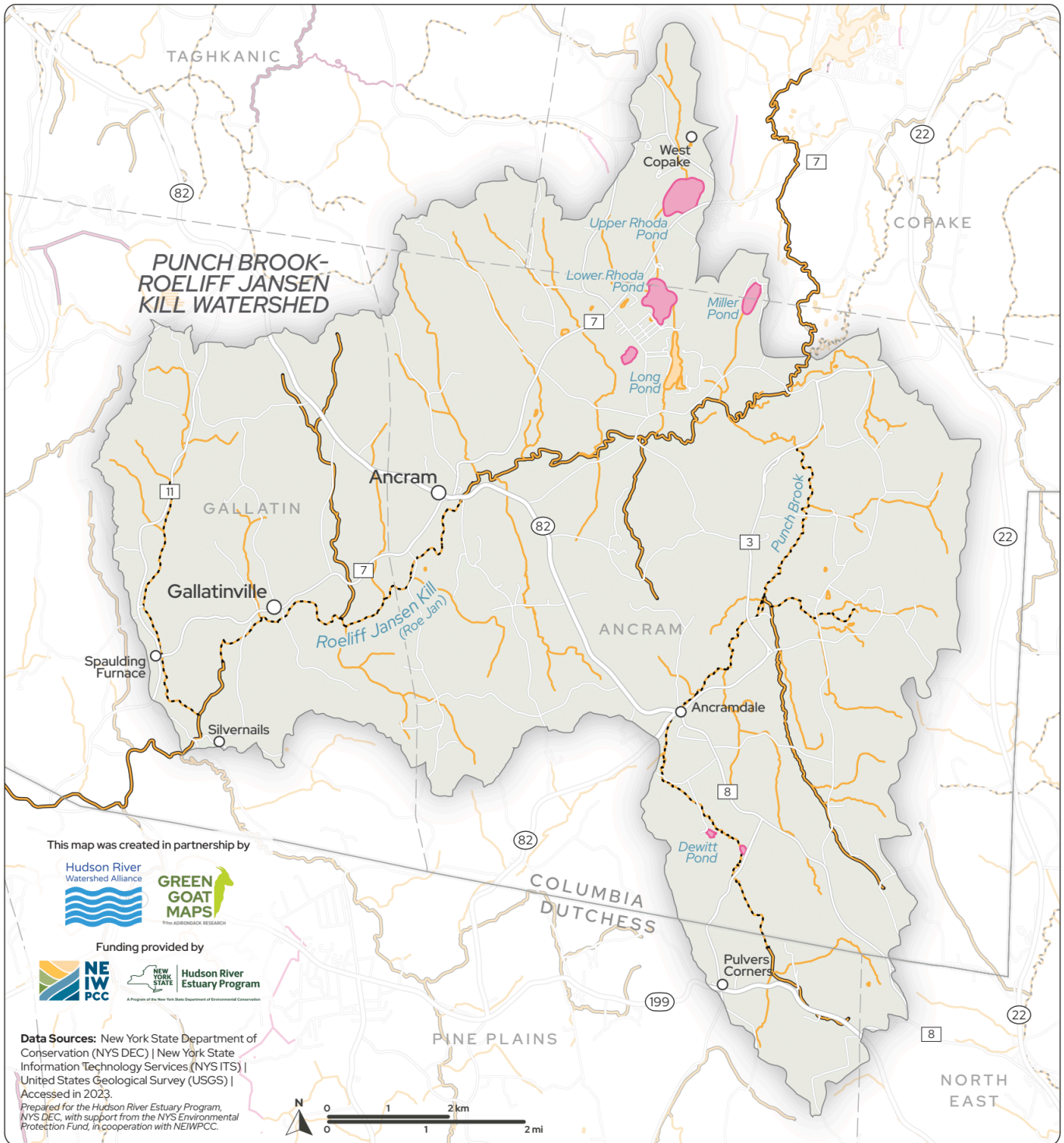


Figure 20. Water classifications and standards in the Punch Brook-Roeliff Jansen Kill watershed.

Waterbody Assessments

The Waterbody Inventory/Priority Waterbodies List is an inventory of New York State’s surface water quality. The Waterbody Inventory/Priority Waterbodies List compiles and interprets information on water quality for surface waters, based on their classification or “best use” (see previous section on Waterbody Classifications and Standards). For each waterbody or stream segment, the Waterbody Inventory/Priority Waterbodies List summarizes water quality conditions, the extent to which it meets designated uses, and progress towards identifying and resolving water quality problems.

To better assess water quality at a regional scale, most waterbodies are grouped into segments based on classification, size, and land use or character. Segments are assessed as:

- Impaired Waters
- Waters with Minor Impacts
- Threatened Waterbodies
- Waterbodies with Impacts Needing Verification
- Waterbodies with No Known Impacts
- Unassessed Waterbodies

The Punch Brook-Roeliff Jansen Kill watershed includes two stream segments and two lakes within the Waterbody Inventory/Priority Waterbodies List (Figure 21, Table 23). The segment Punch Brook and tribs is currently Unassessed, but water quality monitoring and assessment is currently in process and expected to be updated later in 2024. [Roeliff Jan Kill, Mid, and minor tribs](#) has No Known Impacts to water quality. Miller Pond is currently Unassessed. [Long Pond and Lower/Upper Rhoda Ponds](#) are grouped together as one lake segment and listed as Needs Verification, because nutrient monitoring results from the Citizen Statewide Lake Assessment Program (CSLAP) show impairment of primary and secondary contact recreation (Table 24).

Waterbody impairment is determined using data from NYS DEC’s water quality monitoring and other available information. Impaired waters that do not meet applicable water quality standards are considered for inclusion on the state’s Clean Water Act Section 303(d) List. The process for conducting assessments of best use(s) is available in NYS DEC’s [Consolidated Assessment and Listing Methodology](#). No waters in the Punch Brook Roeliff Jansen Kill watershed are on the 303(d) list of impaired waters.

Waterbody Inventory/Priority Waterbodies List segments and waterbody assessments are available through the [DECinfo Locator](#).

WATER QUALITY OF THE PUNCH BROOK-ROELIFF JANSEN KILL WATERSHED

- Community Sampling Sites**
- Roe Jan Watershed Community Sampling Points
 - ▲ Citizen's Statewide Lake Assessment Program

- NYS DEC Aquatic Biomonitoring Sampling Sites**
- - Moderately Impacted
 - - Slightly Impacted
 - - Non-Impacted
 - - Data Not Yet Available

- Priority Waterbodies List**
- - Impaired
 - - No Known Impact
 - - Possibly Impaired, Needs Verification
 - - Not Assessed

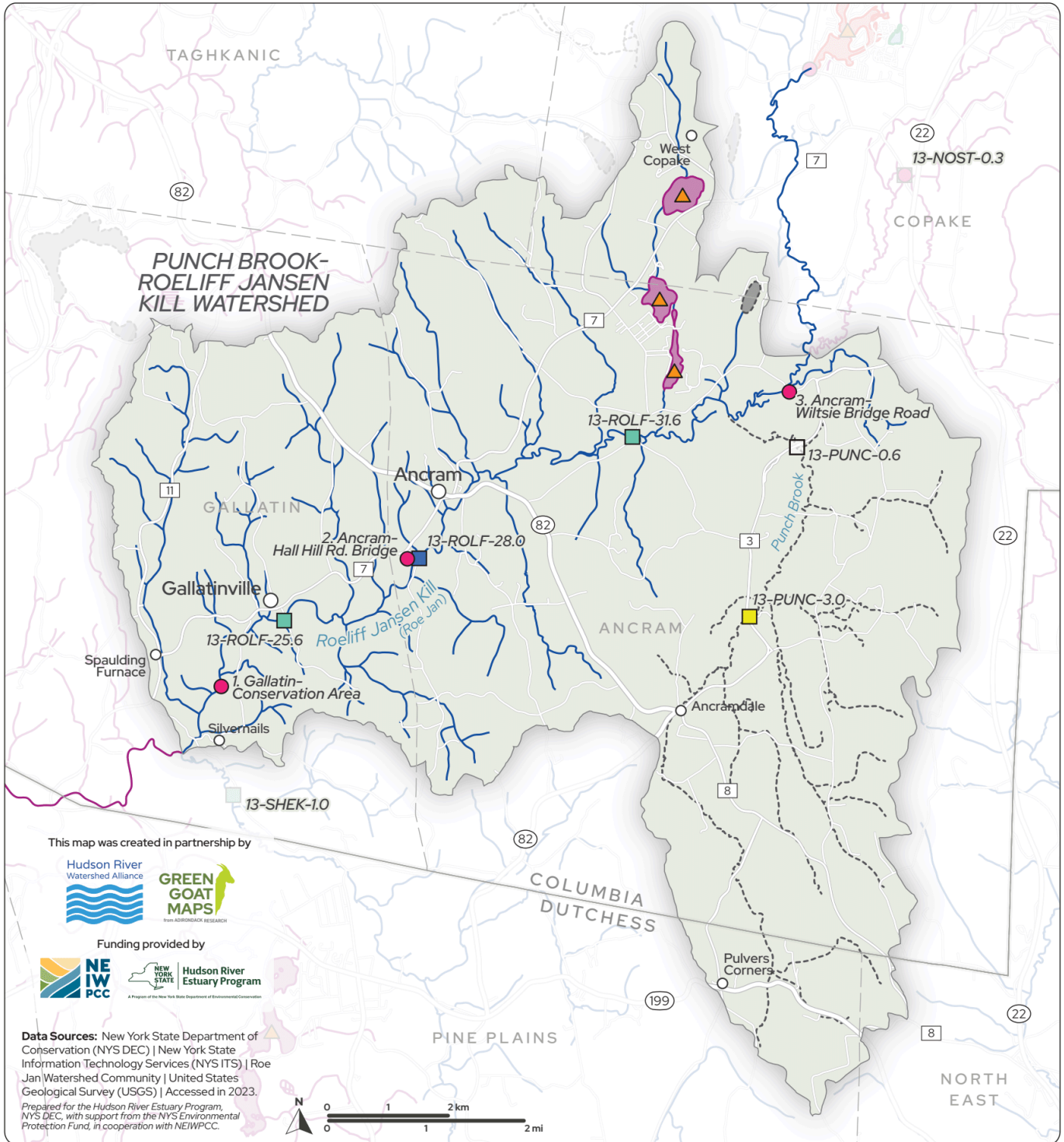


Figure 21. Waterbody assessments and water quality in the Punch Brook-Roeliff Jansen Kill watershed.

Table 23. Waterbody Inventory/Priority Waterbodies List Stream segments and lakes within the Punch Brook-Roeliff Jansen Kill watershed.

Type	Waterbody Name	PWL ID	WIN	Size	Description	Assessment	Last Update
Stream	Punch Brook and tribs	1308-0020	H-188-57	Not available	Entire stream and tribs	Unassessed	None
Stream	Roeliff Jan Kill, Mid, and minor tribs	1308-0011	H-188	90.0 miles	Stream and select tribs, from Silvernails to Taconic Shores	No Known Impact Fact Sheet	11/5/07
Lake	Miller Pond	1308-0019	H-188-56-P 891	Not available	Entire lake	Unassessed	None
Lake	Long Pond, Lower/Upper Rhoda Ponds	1308-0018	H-188-55-P 887, P888, P889	166.6 acres	Total area of all three lakes	Needs Verification Fact Sheet	12/7/21

Source: Waterbody Inventory/Priority Waterbodies List (Shorelines, Rivers and Streams, Lakes and Reservoirs)
 Publisher: NYS Department of Environmental Conservation
 Publication Year: As needed, but at least once every two years. Last updated 12/18/21; Information accessed through the DECinfo Locator.

Table 24. Assessment of best use of Long Pond and Lower/Upper Rhoda Ponds.

Best Use	Use Assessment	Use Assessment Confirmation	Pollutant(s)	Integrated Reporting Category	303(d) Year
Fishing	Unassessed	—	No data	IR3	N/A for Assessment Category
Secondary Contact Recreation	Impaired	Unconfirmed	Phosphorus	IR3	N/A for Assessment Category
Primary Contact Recreation	Impaired	Unconfirmed	Phosphorus	IR3	N/A for Assessment Category

Source: [Waterbody Inventory/Priority Waterbodies List \(WI/PWL\) Fact Sheet: LONG POND, LOWER/UPPER RHODA PONDS \(SEGMENT ID 1308-0018\)](#)

Publisher: NYS Department of Environmental Conservation
 Publication Year: 2021; Information accessed through the DECinfo Locator.

Water Quality Monitoring

Water quality can be assessed in streams and lakes using a variety of parameters and methods. Biological monitoring (also called biomonitoring) uses the abundance and kinds of aquatic organisms as a measure of waterbody health. The organisms collected from polluted water differ from those collected in clean water, providing information on relative water quality. NYS DEC's Stream Biomonitoring Unit has conducted [biological monitoring](#) since 1972 to assess [water quality of rivers and streams](#). More information on NYS DEC's [water quality monitoring programs](#) is available on their website.

There are four NYSDEC biomonitoring sites in the Punch Brook-Roeliff Jansen Kill watershed, including one on the Punch Brook and three on the Roeliff Jansen Kill (Figure 21, Table 25). Information on aquatic biological monitoring is available on the [DECinfo Locator](#). Additional details about water quality at each site, including chemistry, biomonitoring, habitat, and user perception, is available through the NYS DEC [Division of Water Monitoring Data Portal](#).

Table 25. NYS DEC Biomonitoring sites within the Punch Brook-Roeliff Jansen Kill watershed.

Stream Name	Site ID	Most Recent Assessment Status	Most Recent Assessment Date
Punch Brook	13-PUNC-3.0	Moderately impacted	9/11/2007
Roeliff Jansen Kill	13-ROLF-31.6	Slightly impacted	7/28/1992
Roeliff Jansen Kill	13-ROLF-28	Non-impacted	7/28/1992
Roeliff Jansen Kill	13-ROLF-25.6	Slightly impacted	7/28/1992

Source: *Aquatic Biological Monitoring Reports*

Publisher: NYS Department of Environmental Conservation

Publication Year: Updated annually, last updated 4/4/22; Information accessed through the DECinfo Locator.

Since 2016, members of the Roe Jan Watershed Community have monitored water quality in the Roeliff Jansen Kill watershed. Samples are collected monthly by volunteers and processed by the Bard College [Community Sciences Lab](#), in partnership with Riverkeeper. Each sample includes data on water temperature, conductivity, temperature compensated conductivity (specific conductivity), turbidity, and Enterococcus fecal-indicator bacteria.

Three sites are located within the Punch Brook-Roeliff Jansen Kill watershed (Figure 21, Table 26). A fourth site located just downstream of Lower Rhoda Pond was monitored for one year (2017) and discontinued. Information on water quality in Lower Rhoda Pond is available through the Citizens Statewide Lake Assessment Program (CSLAP), see section below. Complete datasets from these sites are available through the [Bard Community Sciences Lab: Roe Jan Monitoring Program webmap](#). Enterococcus datasets are available through the [Riverkeeper: Roeliff Jansen Kill website](#).

To evaluate water quality for swimming, the US EPA uses two metrics for Enterococcus. The Enterococcus geometric mean threshold is 30 cfu/100 mL, and considers all collected samples. The Beach Action Value is based on the percent of single samples that are over 60 cfu/100 mL. More information is available in the US EPA [Recreational Water Quality Criteria](#) (2012).

Riverkeeper published a summary of enterococcus data from 2016-2019 in the [Roeliff Jansen Kill Community Water Quality Monitoring Results](#) (2020). Enterococcus in the Punch Brook-Roeliff Jansen Kill was slightly above the geometric mean threshold at two sites in Ancram, and slightly below the geometric mean threshold at the site in Gallatin (Table 26).

Of the 19 Hudson River tributaries that Riverkeeper and community scientists have monitored, overall, the Roeliff Jansen Kill has had the lowest geometric mean of Enterococcus. The geometric mean of Enterococcus across the Roeliff Jansen Kill watershed was 27 cfu/100 mL, based on samples taken between 2016 and 2018. More information is available in Riverkeeper’s [Community Water Quality Monitoring – Tributary Comparison Report](#) (2018).

Table 26. Roe Jan Watershed Community sampling sites within the Punch Brook-Roeliff Jansen Kill watershed.

# on Map	Site Name	Waterbody Name	Sampling Years	Enterococcus Geometric Mean	% of samples above EPA Beach Action Value
1	Gallatin- Conservation Area	Roeliff Jansen Kill	2017-2019	27.6 cfu/100 mL	24%
2	Ancram- Hall Hill Rd. Bridge	Roeliff Jansen Kill	2016-2019	30.5 cfu/100 mL	26%
3	Ancram- Wiltsie Bridge Road - public fishing access point	Roeliff Jansen Kill	2016-2019	31.3 cfu/100 mL	25%

*Source: Roeliff Jansen Kill Community Water Quality Monitoring Results 2016-2019
 Publisher: Riverkeeper
 Publication Year: 2020*

Community scientists have also used biomonitoring at two sites in the Punch Brook-Roeliff Jansen Kill watershed through the NYS DEC’s [Water Assessments by Volunteer Evaluators program](#) (Figure 21, Table 27). Volunteers assessed water quality at Hall Hill Rd. Bridge and Wiltsie Bridge/Snyder Road. Results are available in the [2016 WAVE Sample Data Summary Chart: Upper Roe Jan Watershed](#) (2016).

Table 27. WAVE assessment sites within the Punch Brook-Roeliff Jansen Kill watershed.

# on Map	Site Name	Waterbody Name	WAVE Assessment	Izaak Walton League Score
2	Ancram- Hall Hill Rd. Bridge	Roeliff Jansen Kill	No conclusion (2016)	Good (20/27)
3	Ancram- Wiltsie Bridge Road - public fishing access point	Roeliff Jansen Kill	No Known Impact (2016)	Fair (15/27)

Source: [Division of Water's WAVE Program: Volunteer macroinvertebrate monitoring at wadeable streams](#)

Publisher: NYS Department of Environmental Conservation

Publication Year: 2022, accessed 1/24/24

Community scientists monitor water quality in lakes through the [Citizens Statewide Lake Assessment Program \(CSLAP\)](#). CSLAP is a volunteer lake monitoring and education program managed cooperatively by NYS DEC and New York State Federation of Lake Associations. Upper Rhoda Pond, Lower Rhoda Pond, and Long Pond are monitored through CSLAP (Figure 21, Table 28). More information is available through the CSLAP annual reports, which are accessible through the [DECinfo Locator](#).

Table 28. CSLAP reports for lakes and ponds within the Punch Brook-Roeliff Jansen Kill watershed.

Waterbody Name	Municipality	Group	Lake Size (acres)	Watershed Size (acres)	CSLAP Reports	Trophic State	HABs Susceptibility	Invasive Vulnerability
Upper Rhoda Pond	Town of Copake	NA	72.8 acres	756 acres	2022 2021	Meso-eutrophic	No Reported Blooms, Moderate susceptibility	No invasives present ⁵ , Moderate vulnerability
Lower Rhoda Pond	Town(s) of Ancram, Copake	Rhoda Lake Community, Inc.	58 acres	1,760 acres	2022 2021 2020	Meso-trophic	No Reported Blooms, Low susceptibility	Invasives present, High vulnerability
Long Pond	Town of Ancram	Friends of Long Lake	12 acres	1,971 acres	2022 2021 2020	Meso-trophic	Periodic Blooms, Low susceptibility	Invasives present, High vulnerability

Source: Citizens Statewide Lake Assessment Program (CSLAP) Annual Reports

Publisher: NYS Department of Environmental Conservation

Publication Year: Updated annually, last updated 11/23/22; Information accessed through the DECinfo Locator.

⁵ While the 2022 CSLAP report for Upper Rhoda Pond indicated that no invasives are present, past CSLAP reports have documented the presence of invasive species. In 2023, the Upper Rhoda Lake Association [applied to NYS DEC for a permit](#) to remove curly leaf pond weed and Eurasian Milfoil.

Water Infrastructure

New York State uses the [State Pollutant Discharge Elimination System \(SPDES\)](#) to control wastewater and stormwater discharges, in accordance with the federal Clean Water Act. Additional information on SPDES permits for both wastewater and stormwater is available through the [DECinfo Locator](#). SPDES permit compliance status information is available from the US EPA's [Enforcement and Compliance History Online \(ECHO\)](#).

For information on drinking water infrastructure, see the [Aquifers & Water Use](#) section.

Stormwater

NYS DEC issues a [Multi-Sector General Permits for Stormwater Discharge Associated with Industrial Activity](#), which regulates stormwater discharges to surface waters from a point source with industrial activity. The Schweitzer-Mauduit International paper mill is the one facility in the Punch Brook-Roeliff Jansen Kill watershed with an industrial stormwater permit (Figure 16, Table 29). Additional information on NYS DEC's [Stormwater Regulatory Requirements](#) is available on their website. For more information on the Schweitzer-Mauduit paper mill, see the [Built Environment](#) section and the [Large Water Withdrawals](#) section.

Table 29. Multi-Sector General Permits for Stormwater Discharge Associated with Industrial Activity within the Punch Brook-Roeliff Jansen Kill watershed.

Facility Name	Location (Municipality)	SPDES Permit	SIC Code: SIC Description	Sector	EPA ECHO Report
Schweitzer - Mauduit International, Inc	Town of Ancram	NYR00C573	2621: Paper Mill	B	EPA Echo Report

Source: Multi-Sector General Permits (MSGP)

Publisher: NYS Department of Environmental Conservation

Publication Year: updated quarterly, last updated 9/30/2022; Information accessed through the DECinfo Locator.

Wastewater

New York State law requires a permit for constructing or using an outlet or discharge pipe (called a "point source") that discharges wastewater into the surface waters or groundwaters of the state. Permits are also required for constructing or operating a disposal system, such as a sewage treatment plant.

The Punch Brook-Roeliff Jansen Kill watershed includes four wastewater treatment facilities (Figure 16, Table 30). All four wastewater facilities are considered minor (discharge class 09 or 01). The rest of the watershed is presumed to be served by private, on-site septic systems.

Table 30. Wastewater treatment facilities within the Punch Brook-Roeliff Jansen Kill watershed.

Facility Name Permittee Name	Location (Municipality)	Receiving Waters Water Index Number Waterbody Classification	SPDES Permit Discharge Class	Outfalls: Wastewater Type
Town Highway Garage Town of Ancram	Town of Ancram	Wetlands (CO-24) to Punch Brook WIN: H-188-57 Class: C	NY0282430 09 Document Folder	001: Effluent of oil-water separator (Snow/ice melt, vehicle rinse water, & rain)
Simon's General Store The Ancram Preservation Group, Inc.	Town of Ancram	Unnamed tributary to Roeliff Jansen Kill WIN: H-188-47D Class: C(T)	NY0282448 09 Document Folder	001
Schweitzer - Mauduit International, Inc - Ancram Mill Schweitzer - Mauduit International, Inc	Town of Ancram	Roeliff Jansen Kill WIN: H-188 Class: C(T)	NY0006157 01 Document Folder	001: Water Intake Bypass 003: Process wastewater, cooling water, and landfill leachate 006: Sanitary wastewater 007: Fire Protection Discharge 002, 005, and 008-14: Regulated under SPDES Multi-Sector General Permit GP-0-06002 for Stormwater Discharges
Camp Pontiac Camp Pontiac	Town of Copake	Subsurface discharge WIN: Not Applicable Class: GA	NY0282499 01 Document Folder	001, 002, & 003: effluent from on-site treatment system

Source: Wastewater Facilities (SPDES)

Publisher: NYS Department of Environmental Conservation

Publication Year: updated daily, accessed 12/18/22; Information accessed through the DECinfo Locator.

People of the Punch Brook-Roeliff Jansen Kill Watershed

This section focuses on the people living in and caring for the watershed.

Demographics

The six towns within the Punch Brook-Roeliff Jansen Kill watershed have a combined total population of about 12,800 people (Table 31). The approximate population of the Punch Brook-Roeliff Jansen Kill watershed is 1,890 people, estimated based on the total population of each municipality and the percentage of each municipality in the watershed.

The population of each town in the watershed has declined between 2010 and 2020, according to the 2020 [US Census](#) (Table 31).

Table 31. Population in the Punch Brook-Roeliff Jansen Kill watershed

Municipality (County)	Percent of Municipality within the Watershed	2023 Total Population of Municipality	Percent Population Change 2010-2020*
Town of Ancram (Columbia County)	71.2%	1,409	-8%
Town of Gallatin (Columbia County)	28.6%	1,643	-2%
Town of Copake (Columbia County)	6.7%	2,168	-7%
Town of Pine Plains (Dutchess County)	6.5%	3,332	-10%
Town of Taghkanic (Columbia County)	2.2%	1,266	-6%
Town of North East (Dutchess County)	0.7%	2,984	-0.2%
TOTAL		12,802	

Source: [Esri Updated Demographics Variables, Feature Service](#)

Publisher: ESRI

Publication Year: 2023; Accessed 1/31/24

*Source: US Census

Publisher: US Census Bureau

Publication Year: 2020

Table 32 shows the race and ethnicity of the total population of the six watershed municipalities, which is mostly White and Non-Hispanic.

Table 32. Race and Ethnicity in the Punch Brook-Roeliff Jansen Kill watershed

Race or Ethnicity	Percent, based on Municipality's Total Population
White Non-Hispanic	84.1%
Hispanic	7.5%
Multiple Races Non-Hispanic	5.1%
Black/African American Non-Hispanic	1.4%
Asian Non-Hispanic	1.4%
Other Races Non-Hispanic	0.6%
American Indian/Alaska Native Non-Hispanic	0.1%
Pacific Islander Non-Hispanic	0.02%

Source: [Esri Updated Demographics Variables, Feature Service](#)

Publisher: ESRI

Publication Year: 2023; Accessed 1/31/24

Vulnerable Populations

Environmental burdens, including polluted water and flood risks, fall disproportionately on marginalized communities. There are a number of tools to help understand the vulnerability of the watershed's populations.

Households in Financial Stress

There are two thresholds of financial stress: 1) the standard federal poverty rate, which was \$13,788 for one person and \$27,740 for a four-person household in 2021, and 2) the Asset Limited, Income Constrained, Employed (ALICE) rate, which includes households that earn more than the Federal Poverty Level, but less than the basic cost of living for the county. Neither ALICE households nor those living in poverty can afford household essentials: housing, child care, food, transportation, health care, and a basic smartphone plan. For more information, see the [United for ALICE website](#). One quarter to one-third of the households in the six watershed municipalities are financially stressed, based on the municipality's total population (Table 33).

Table 33. People with Low Incomes in Punch Brook-Roeliff Jansen Kill Watershed Towns

Watershed Municipality	Household Poverty Rate	Household ALICE rate	Households that can't afford the essentials
Town of Ancram	6%	25%	31%
Town of Copake	4%	24%	28%
Town of Gallatin	8%	28%	36%
Town of North East	17%	24%	41%
Town of Pine Plains	14%	27%	28%
Town of Taghkanic	5%	28%	33%

Source: U.S. Census Bureau's American Community Survey (ACS), 2021; Alice Threshold 2021
 Publisher: United for Alice
 Publication Year: 2021

NYS Potential Environmental Justice Areas

[Potential Environmental Justice Areas](#) are US Census block groups of 250 to 500 households that meet or exceed certain statistical thresholds for race or ethnicity and household incomes. The Punch Brook-Roeliff Jansen Kill watershed includes a NYS DEC Potential Environmental Justice Area in the portion of the watershed within the Town of Copake (Census Block Group 360210016002) because 34.29% of household incomes are below the federal poverty level. Potential Environmental Justice Areas are available on the [DECinfo Locator](#).

Disadvantaged Communities

New York's Climate Leadership and Community Protection Act requires the identification of disadvantaged communities, so that climate investments are distributed equitably. The state has identified census tracts that are most vulnerable to the impacts of climate change based on 45 indicators of environmental burdens, climate change risks, population characteristics, and health vulnerabilities. The watershed does not include any Disadvantaged Communities. For more information, view the [Final Disadvantaged Communities Map](#) (2023).

The Justice 40 Initiative is a federal effort to ensure the equitable distribution of the federal investments in climate change, clean energy and energy efficiency, clean transit, affordable and sustainable housing, training and workforce development, remediation and reduction of legacy pollution, and the development of critical clean water and wastewater infrastructure. The [Climate and Economic Justice Screening Tool](#) identifies overburdened and underserved areas by census tract. The Punch Brook-Roeliff Jansen Kill watershed does not include disadvantaged census tracts.

For more information about vulnerable populations and how they might be affected by pollution and climate change risk, view [EJScreen](#), EPA's environmental justice mapping and screening tool. The tool may help users identify [census block groups](#) with more vulnerable populations and those with potential environmental quality issues.

Watershed Groups

The [Roe Jan Watershed Community](#) (RJWC) began in 2016 as a citizen science project, sampling water quality to better understand its condition. The RJWC is now a New York State 501(c)(3) not-for-profit corporation working to monitor and enhance the Roeliff Jansen Kill, an important tributary of the Hudson River. The RJWC's water quality monitoring work is described in the [Water Quality](#) section.

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References used for the report, tables, and maps are listed in alphabetical order, by section. If references are included in more than one section, they are included in the first section in which they appear. Secondary data sources used to inform the *Punch Brook-Roeliff Jansen Kill Watershed Characterization Report* are also available in the [GIS Data Spreadsheet](#) and the [Report Data Spreadsheet](#).

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Appendices

Appendix A. Punch Brook-Roeliff Jansen Kill watershed soils.

Map Symbol	Name	Area (m ²)	Percent of total
Ad	Alden silt loam	155567	0.1%
BeC	Bernardston silt loam, 8 to 15 percent slopes	9665	0.0%
BeD	Bernardston silt loam, 15 to 25 percent slopes	161472	0.1%
Bh	Birdsall silt loam	8946	0.0%
BIA	Blasdell channery loam, 0 to 3 percent slopes	2842332	2.3%
BIB	Blasdell channery loam, 3 to 8 percent slopes	2594047	2.1%
BIC	Blasdell channery loam, rolling	5525334	4.5%
BID	Blasdell channery loam, hilly	2495741	2.0%
BmA	Blasdell channery silt loam, 0 to 3 percent slopes	284531	0.2%
BmB	Blasdell channery silt loam, 3 to 8 percent slopes	180184	0.1%
Cc	Catden muck, 0 to 2 percent slopes	2399874	1.9%
Ce	Castile gravelly silt loam	150108	0.1%
CuB	Cheshire-Urban land complex, 2 to 8 percent slopes	144099	0.1%
CuC	Cheshire-Urban land complex, 8 to 15 percent slopes	83341	0.1%
CuD	Copake gravelly silt loam, hilly	60668	0.0%
DwC	Dutchess-Cardigan complex, rolling, rocky	247948	0.2%
FaB	Farmington silt loam, undulating, very rocky	203214	0.2%
FaC	Farmington silt loam, rolling, very rocky	2526089	2.0%
FaD	Farmington silt loam, hilly, very rocky	2601152	2.1%
FcC	Farmington-Galway complex, rolling, very rocky	58070	0.0%
FdE	Farmington-Rock outcrop complex, steep	1046044	0.8%
Ff	Fluvaquents-Udifluents complex, frequently flooded	9269	0.0%
Fn	Fluvaquents-Udifluents complex, frequently flooded	2841808	2.3%
Fr	Fredon loam	695612	0.6%
GaA	Georgia silt loam, 0 to 3 percent slopes	235336	0.2%
GaB	Georgia silt loam, 3 to 8 percent slopes	2166699	1.8%
GaC	Georgia silt loam, 8 to 15 percent slopes	2000009	1.6%
GfD	Galway-Farmington complex, hilly	65255	0.1%
GsB	Georgia silt loam, 3 to 8 percent slopes	304367	0.2%
GsC	Georgia silt loam, 8 to 15 percent slopes	57947	0.0%

Map Symbol	Name	Area (m ²)	Percent of total
Ha	Halsey mucky silt loam	251595	0.2%
HoA	Hoosic gravelly sandy loam, 0 to 3 percent slopes	4380	0.0%
HoC	Holyoke-Rock outcrop complex, rolling	46406	0.0%
HoD	Holyoke-Rock outcrop complex, hilly	92796	0.1%
HpE	Hoosic and Blasdell soils, steep	474826	0.4%
HsC	Hoosic gravelly loam, rolling	30416	0.0%
HsD	Hoosic gravelly loam, hilly	52891	0.0%
HtA	Hoosic channery loam, fan, 0 to 3 percent slopes	42921	0.0%
HtB	Hoosic channery loam, fan, 3 to 8 percent slopes	78230	0.1%
KrB	Knickerbocker fine sandy loam, undulating	34296	0.0%
Ln	Linlithgo silt loam	3475393	2.8%
Lo	Linlithgo silt loam	1244195	1.0%
MaC	Macomber-Taconic association, strongly sloping, rocky	551565	0.4%
MbE	Macomber-Taconic association, steep, very rocky	2272255	1.8%
MnB	Massena silt loam, 3 to 8 percent slopes	1131274	0.9%
MnC	Manlius channery silt loam, 8 to 15 percent slopes	2045583	1.7%
MnD	Manlius channery silt loam, 15 to 25 percent slopes	1022206	0.8%
MsA	Massena silt loam, 0 to 3 percent slopes	760973	0.6%
MsB	Massena silt loam, 3 to 8 percent slopes	1754808	1.4%
NaB	Nassau channery silt loam, undulating, rocky	808069	0.7%
NbC	Nassau channery silt loam, rolling, very rocky	10513095	8.5%
NbD	Nassau channery silt loam, hilly, very rocky	15712079	12.7%
NbE	Nassau channery silt loam, steep, very rocky	7653332	6.2%
NcA	Natchaug muck, 0 to 2 percent slopes	1018227	0.8%
NwB	Nassau-Cardigan complex, undulating, very rocky	523334	0.4%
NwC	Nassau-Cardigan complex, rolling, very rocky	1116208	0.9%
NwD	Nassau-Cardigan complex, hilly, very rocky	1307042	1.1%
NxE	Nassau-Rock outcrop complex, steep	75798	0.1%
NyA	Natchaug muck, 0 to 2 percent slopes	48273	0.0%
Om	Occum loam	246779	0.2%
Pr	Pits, quarry	12239	0.0%
Ps	Pits, gravel	67520	0.1%
PtB	Pittstown silt loam, 3 to 8 percent slopes	25651	0.0%

Map Symbol	Name	Area (m ²)	Percent of total
PtC	Pittstown silt loam, 8 to 15 percent slopes	263221	0.2%
PtD	Pittstown silt loam, 15 to 25 percent slopes	124486	0.1%
PuB	Punsit silt loam, 3 to 8 percent slopes	46335	0.0%
PuC	Punsit silt loam, 8 to 15 percent slopes	41676	0.0%
Sa	Sloan silt loam	137269	0.1%
ScB	Scio silt loam, 3 to 8 percent slopes	13058	0.0%
SkB	Stockbridge silt loam, 3 to 8 percent slopes	475375	0.4%
SkC	Stockbridge silt loam, 8 to 15 percent slopes	411692	0.3%
SkD	Stockbridge silt loam, 15 to 25 percent slopes	387722	0.3%
SkE	Stockbridge silt loam, 25 to 45 percent slopes	41875	0.0%
SmC	Stockbridge-Farmington complex, rolling, rocky	7214	0.0%
StB	Stockbridge silt loam, 3 to 8 percent slopes	2365375	1.9%
StC	Stockbridge silt loam, 8 to 15 percent slopes	5565226	4.5%
StD	Stockbridge silt loam, 15 to 25 percent slopes	6327870	5.1%
StE	Stockbridge silt loam, 25 to 35 percent slopes	1118738	0.9%
Su	Sun silt loam	92422	0.1%
SuB	Stockbridge-Farmington silt loams, undulating	1719704	1.4%
SuC	Stockbridge-Farmington silt loams, rolling	10233613	8.3%
SvD	Stockbridge-Farmington silt loams, hilly, very rocky	2544850	2.1%
Sw	Sun silt loam	3894078	3.1%
TmF	Taconic-Macomber association, very steep, very rocky	85876	0.1%
Ue	Udorthents, wet substratum	186120	0.2%
W	W	7630	0.0%
W	Water	1159083	0.9%
Wy	Wayland silt loam	60195	0.0%

Source: Soil Survey Geographic Database (SSURGO)

Publisher: Natural Resources Conservation Service and United States Department of Agriculture.

Publication Year: 2003, accessed 2023.

Appendix B. Land Cover Classes within the Punch Brook-Roeliff Jansen Kill watershed.

National Land Cover Database Class	Description	Percent Cover (2021)
Open Water	Areas of open water, generally with less than 25% cover of vegetation or soil.	0.7%
Developed, Open Space	Areas with a mixture of some constructed materials, but mostly vegetation in the form of lawn grasses. Impervious surfaces account for less than 20% of total cover. These areas most commonly include large-lot single-family housing units, parks, golf courses, and vegetation planted in developed settings for recreation, erosion control, or aesthetic purposes.	3.2%
Developed, Low Intensity	Areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 20% to 49% percent of total cover. These areas most commonly include single-family housing units.	2.5%
Developed, Medium Intensity	Areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 50% to 79% of the total cover. These areas most commonly include single-family housing units.	0.6%
Developed, High Intensity	Highly developed areas where people reside or work in high numbers. Examples include apartment complexes, row houses and commercial/industrial. Impervious surfaces account for 80% to 100% of the total cover.	0.1%
Barren Land	Areas of bedrock, desert pavement, scarps, talus, slides, volcanic material, glacial debris, sand dunes, strip mines, gravel pits and other accumulations of earthen material. Generally, vegetation accounts for less than 15% of total cover.	0.1%
Deciduous Forest	Areas dominated by trees generally greater than 5 meters tall, and greater than 20% of total vegetation cover. More than 75% of the tree species shed foliage simultaneously in response to seasonal change.	50.8%
Evergreen Forest	Areas dominated by trees generally greater than 5 meters tall, and greater than 20% of total vegetation cover. More than 75% of the tree species maintain their leaves all year. Canopy is never without green foliage.	0.8%
Mixed Forest	Areas dominated by trees generally greater than 5 meters tall, and greater than 20% of total vegetation cover. Neither deciduous nor evergreen species are greater than 75% of total tree cover.	1.1%
Shrub/Scrub	Areas dominated by shrubs; less than 5 meters tall with shrub canopy typically greater than 20% of total vegetation. This class includes true shrubs, young trees in an early successional stage or trees stunted from environmental conditions.	0.5%

National Land Cover Database Class	Description	Percent Cover (2021)
Grassland/Herbaceous	Areas dominated by graminoid or herbaceous vegetation, generally greater than 80% of total vegetation. These areas are not subject to intensive management such as tilling, but can be utilized for grazing.	0.4%
Hay/Pasture	Areas of grasses, legumes, or grass-legume mixtures planted for livestock grazing or the production of seed or hay crops, typically on a perennial cycle. Pasture/hay vegetation accounts for greater than 20% of total vegetation.	22.8%
Cultivated Crops	Areas used for the production of annual crops, such as corn, soybeans, vegetables, tobacco, and cotton, and also perennial woody crops such as orchards and vineyards. Crop vegetation accounts for greater than 20% of total vegetation. This class also includes all land being actively tilled.	6.9%
Woody Wetlands	Areas where forest or shrubland vegetation accounts for greater than 20% of vegetative cover and the soil or substrate is periodically saturated with or covered with water.	8.9%
Emergent Herbaceous Wetlands	Areas where perennial herbaceous vegetation accounts for greater than 80% of vegetative cover and the soil or substrate is periodically saturated with or covered with water.	0.8%

Source: National Land Cover Database (2021)

Publisher: US Geological Survey

Publication Year: 2021