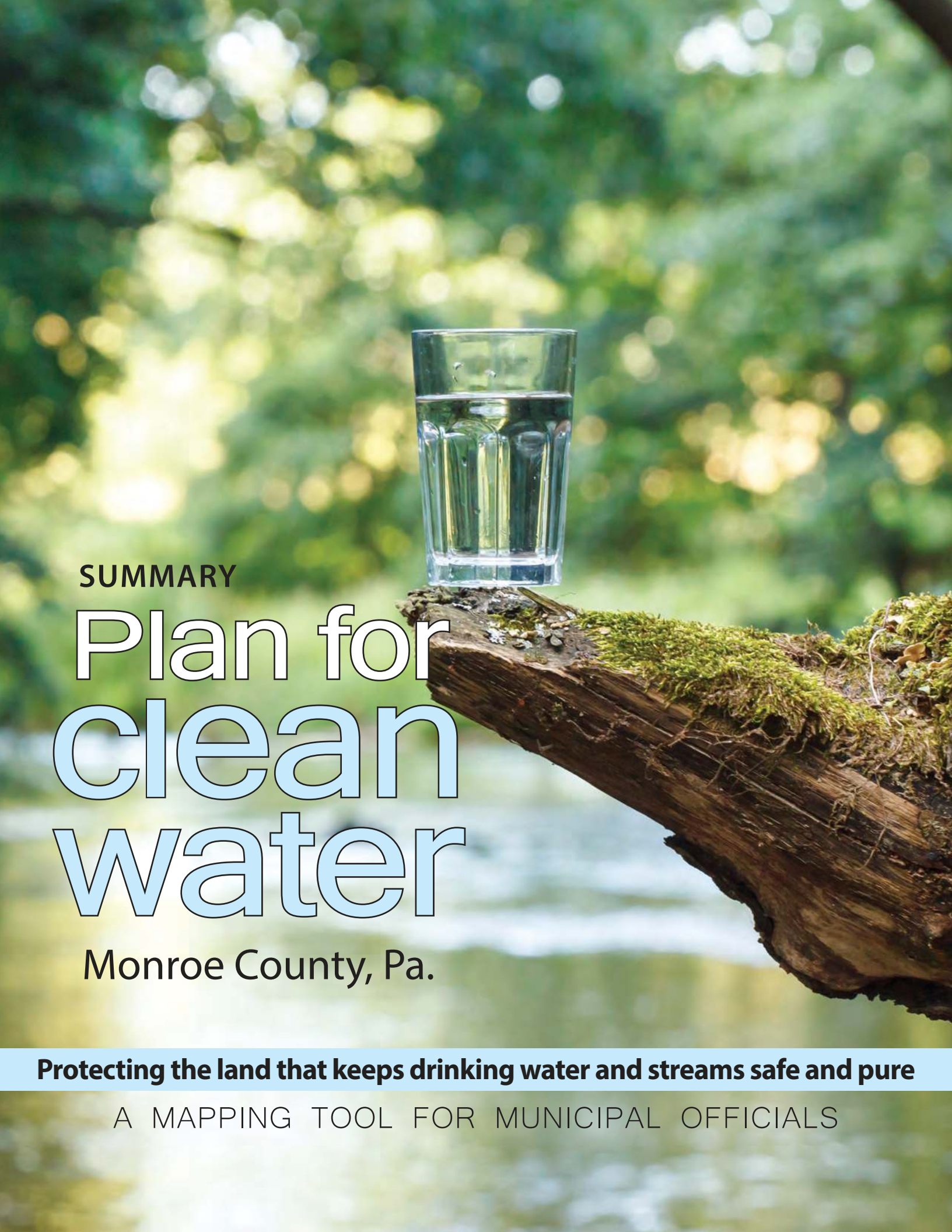


SUMMARY

Plan for clean water

Monroe County, Pa.

Protecting the land that keeps drinking water and streams safe and pure

A MAPPING TOOL FOR MUNICIPAL OFFICIALS

Plan for clean water

EXECUTIVE SUMMARY

Our citizens, visitors, trout streams and economy need safe, abundant water.

- Fresh water is a scarce, finite resource, and is easily polluted. Only a fraction of 1 percent of all the water in the world is available for drinking water and other human uses.

- Monroe County is rich in pure, safe water — both in surface water as wetlands, creeks and streams, and in deep underground "reservoirs," called aquifers.

- Our drinking water is pure, safe, and plentiful thanks to the forested land that filters and otherwise protects it. "Cleaning up" bad drinking water is far more costly than keeping it safe in the first place, and often doesn't work.

- Protecting land protects clean water.

- Municipal officials have the ability through zoning and open space programs to protect land that protects water.

- This plan provides the tools local officials need to make decisions about the most important land to preserve in order to protect water resources.

Protecting water is local.

In Pennsylvania, state law gives municipal officials the authority to plan and zone for clean water and for various land uses in their communities. That means protecting land to protect water is an important part of every municipality's responsibilities.

Land protects and recharges drinking water.

The 300,000-plus acres of forested land in Monroe County (79% of the county) can be credited for the quality of our streams and drinking water resources. Study after study has shown that forests are critically important to the supply of clean drinking water.

Forested land is also vital in protecting areas where groundwater is replenished. These forested "recharge" areas absorb rain and snowmelt. The water then slowly percolates through the earth, filtering out impurities, on the way to replenishing underground aquifers.

If, on the other hand, forested land is paved over, compacted, or built on, drinking water suffers. The land's ability to recharge ground water drops dramatically. Surface waters — creeks, streams, lakes, and wetlands — are degraded, too, as waters laden with sediment, road runoff, and other pollutants reach streams without being cleaned up.

At the same time, people need houses, businesses, and roadways. The tool provided here will help municipal officials make decisions that sustain our local economies while ensuring our water is kept clean and our streams are healthy.

Making informed land use decisions —that take water into account — is the first essential step in protecting this life-giving resource for ourselves and generations yet to come.

Plan for clean water is a science-based tool for decision makers.

This Plan for Clean Water provides county-wide overview maps. On request, the Monroe County Planning Commission will prepare municipal maps to help officials make local land-use decisions that protect water.

Individual parcels are not scored or identified in the plan. That is up to local officials, who know uniquely local conditions — such as locations of existing development, parks and other public land, and privately conserved properties.

Understanding local conditions and using this tool to factor in the need to protect pure water, add up to good decisions. *(See "How to Use This Tool", page 6.)*

MAPPING THE FACTS

A project team, assisted by Dr. Paul Wilson of East Stroudsburg University and Dr. Barry Evans of Penn State University (see team list, page 8), was assembled in mid-2017 to develop this Plan for Clean Water.

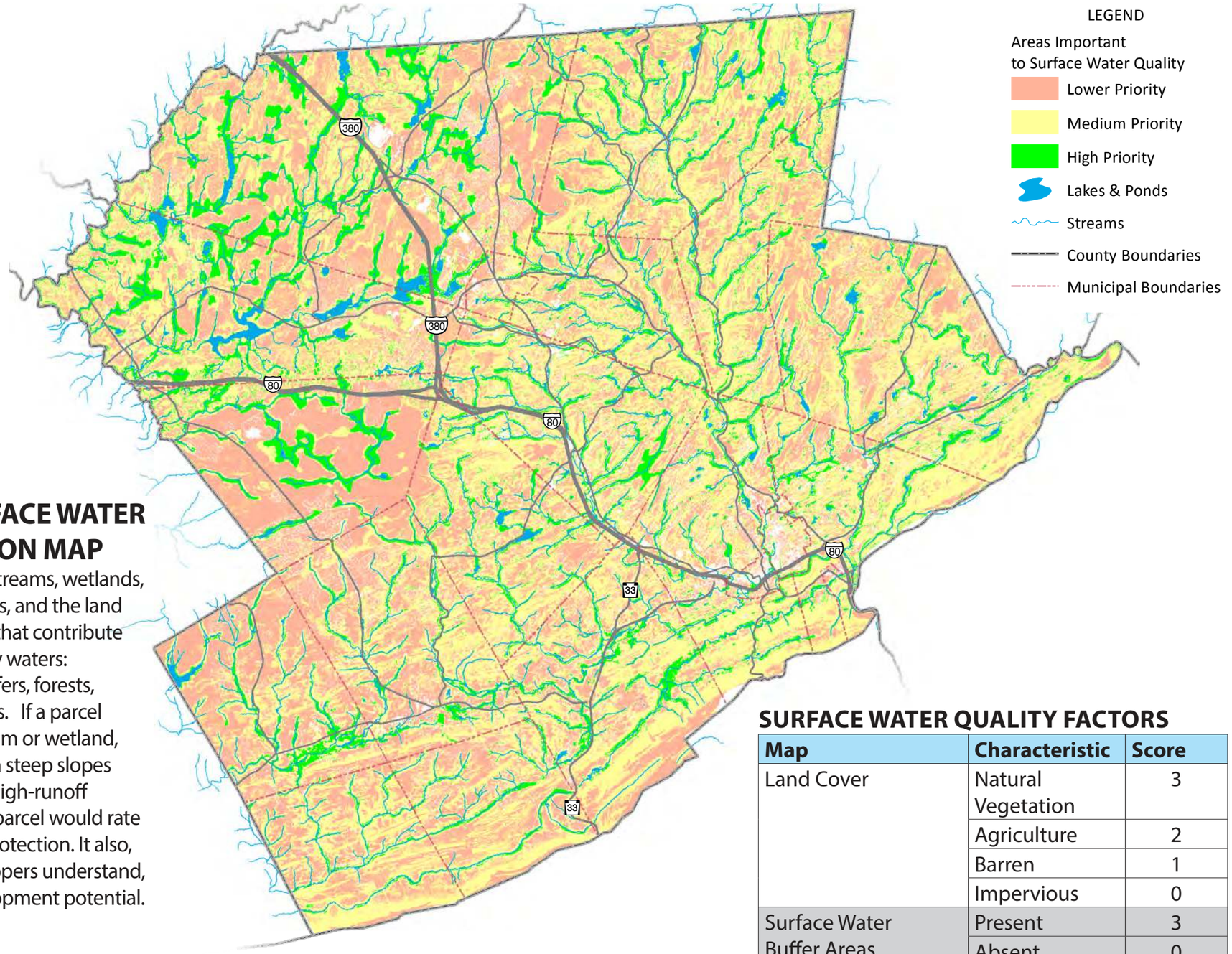
To identify land as high, medium or low priority for water protection, the team defined important factors that affect surface water protection and aquifer recharge potential. These are the factors on which the maps are based.

Factors affecting surface water quality

Surface water includes creeks, streams, wetlands, ponds, and lakes. These features were identified first. As the quality of surface water correlates directly with the protection it receives from surrounding land, features of the land that impact water quality were evaluated next. They include:

MAP: *Monroe's surface water quality*

- **Wetlands and wet or "hydric" soils**
- **Streamside buffers** – those areas alongside our streams and rivers that keep them healthy
- **Land cover/vegetation** – forest areas are important filters and help to keep water clean
- **Soil erosion potential** – sediment- and pollution-laden runoff is greatest in areas of where soils have a high runoff potential and slopes are steep.

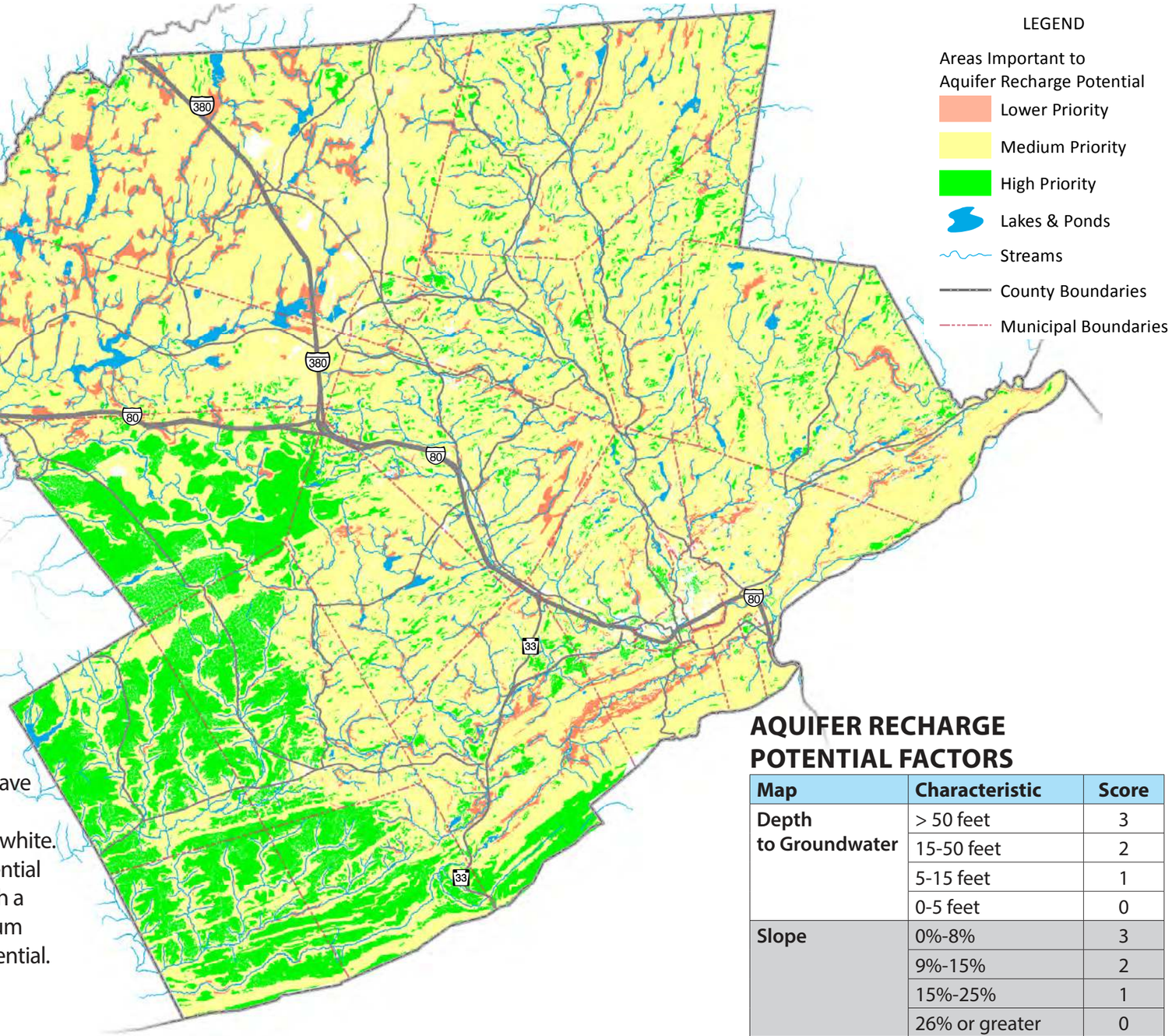


THIS SURFACE WATER PROTECTION MAP illustrates our streams, wetlands, ponds and lakes, and the land characteristics that contribute most to healthy waters: streamside buffers, forests, soils, and slopes. If a parcel contains a stream or wetland, is forested, with steep slopes and soils with high-runoff potential, that parcel would rate very high for protection. It also, as many developers understand, has little development potential.

IF ALL THE BEST FACTORS ARE PRESENT, the best score is 12. To simplify the map, the 1-12 scores are divided into categories of importance, and shown as most to less important for surface water quality protection: Most important, 9-12 (green); Medium 4-8 (yellow); and Less important 1-3 (red). Impervious areas are shown in white.

SURFACE WATER QUALITY FACTORS

Map	Characteristic	Score
Land Cover	Natural Vegetation	3
	Agriculture	2
	Barren	1
	Impervious	0
Surface Water Buffer Areas	Present	3
	Absent	0
Wetland Indicators Factor	Present	3
	Absent	0
Soil Erodibility Factor	High	3
	Medium	2
	Low	1
	Least	0



THIS AQUIFER RECHARGE POTENTIAL MAP

illustrates glacial deposit thickness, slope, hydrologic soil group and depth to groundwater. Impervious surfaces that have no recharge potential are masked out and shown as white. Areas that have some potential for recharge are coded with a color – high (green), medium (yellow), and low (red) potential.

THIS MAP combines the four factors described here, using the ranking system in the chart. If the best parameter for all four factors is present, that spot will score 12. For example: If Depth to Groundwater is greater than 50 feet, the slope is less than 8%, there is no glacial deposit and the soil type is Group A, that spot on the map will score 12.

To simplify viewing the map, the scores of 1-12 are divided into three groups – Most Important, 9-12 (green) Medium 4-8 (yellow) and Least Important 1-3 (red).

Note: On this map, areas with no potential for aquifer recharge are masked out and shown in white.

AQUIFER RECHARGE POTENTIAL FACTORS

Map	Characteristic	Score
Depth to Groundwater	> 50 feet	3
	15-50 feet	2
	5-15 feet	1
	0-5 feet	0
Slope	0%-8%	3
	9%-15%	2
	15%-25%	1
	26% or greater	0
Glacial Deposit Thickness	Non-existent	3
	Thin	2
	Thick	1
Hydrologic Soil Group	Soil Group A	3
	Soil Group B	2
	Soil Group C	1
	Soil Group D	0

Factors affecting aquifer recharge potential

Healthy aquifers provide the water that keeps wells supplied and streams flowing, even during times of drought. The following factors were used to evaluate the potential for the land to recharge underlying aquifers:

***MAP:** Monroe's aquifer recharge potential*

· **Glacial deposit thickness** – Thicker deposits limit recharge.
· **Slope of the land** – Flatter land allows more recharge.
· **Hydrologic Soil Group (HSG)** – The best soils allow more infiltration.
· **Depth to groundwater** – Deeper groundwater permits more recharge.

(For more detailed explanation of these factors, see Technical Report I.)

HOW TO USE THIS TOOL

Working with these maps will give you a new dimension for understanding your community and allow you to work proactively to protect the most important lands for water resource protection.

Go to **PlanForCleanWater.org**, where you will find the P4CW maps. Orient yourself by looking first at the two composite maps: Surface Water Quality and Aquifer Recharge Potential.

Zoom in to your municipality and explore. Explore hills and valleys, stream corridors, developed and undeveloped areas. The color coding will show some areas that are clearly important to protecting Surface Water Quality. Others will have clear Aquifer Recharge Potential.

The most important lands to protect score high for both Surface Water Quality and Aquifer Recharge Potential. For more detail, you will need to go deeper by studying the maps of individual factors.

With this information about how land contributes to water protection, consider local factors, such as proximity to development or conserved land, the need for public services, or the risk of degrading well water, for example. A site visit will reveal other concerns that should be factored in to the decision.

Take action.

- Consider purchasing land or acquiring easements on particularly high scoring properties to protect water;
- Review zoning ordinances to assure major development is zoned in appropriate locations;
- Educate your residents about what they can do to help protect water.

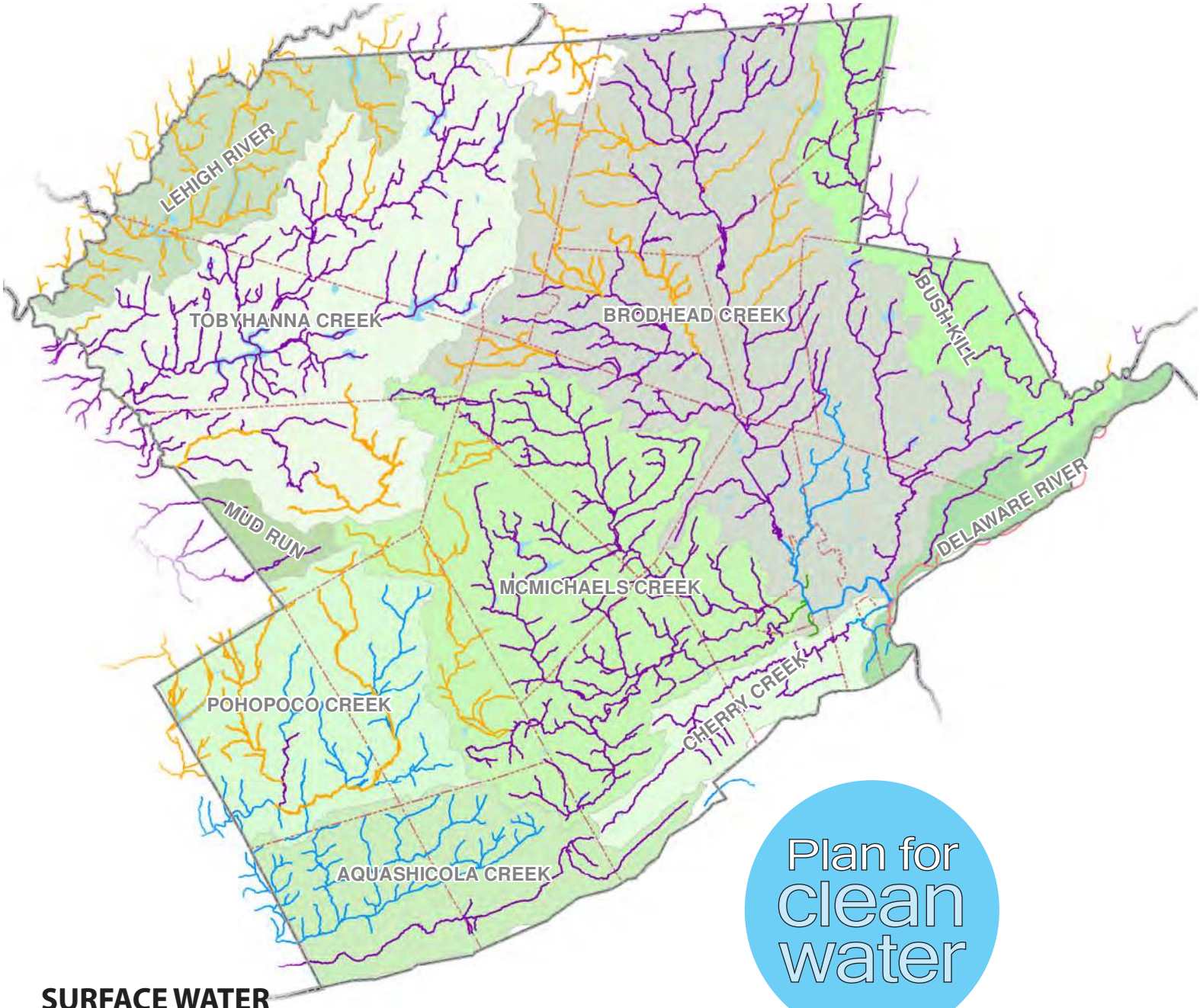
Tip: *If you need to see this information for a particular parcel, call Monroe County Planning Commission. Ask for a map that superimposes the area under review on the surface water and aquifer protection maps. This will pinpoint the exact areas where protection is most important.*

More discussion on using this mapping tool is in Technical Report II.

The good news: It's not hard to protect our water.

It just takes a little planning and common sense, and money well spent. The zoomable maps online at **PlanForCleanWater.org** will help.

Monroe County is water-rich. Knowing where water is concentrated, how the land protects it, and taking steps to plan new development for areas which are not a priority for water protection will keep water safe, pure, and plentiful for today — and for generations to come.



Plan for clean water

SURFACE WATER PROTECTED USES

- EV
- HQ-CWF
- HQ-TSF
- CWF
- TSF
- TSF
- WWF
- Lakes & Ponds
- County Boundaries
- Municipal Boundaries

EV - Exceptional Value
HQ - High Quality
CWF - Cold Water Fishes
TSF - Trout Stocking
WWF - Warm Water Fishes

Everywhere you turn in Monroe County,

you cross another stream. No wonder: We are fortunate to have 1,690 miles of streams in the county. Water quality is maintained through state regulation, local land use choices, and by landowners who care for their land and streams.

Plan for clean water

THE PROJECT TEAM

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Fallon Horan, Community Planner
Nate Staruch, Senior Planner

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Adam Schelhammer, Manager
Annie Mikol, Watershed Specialist

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Plan for Clean Water, Monroe County is funded by the Open Space Institute and the William Penn Foundation.

The Open Space Institute protects land that supports the things we can't live without — like clean water, climate protection, and healthy communities — and safeguards the places that make life worth living, like parks for recreation and plant and animal habitat. Over the past 40 years, OSI has helped save millions of acres through land acquisition, funding, and research and advocacy. ***www.openspaceinstitute.org***

William Penn Foundation supports projects that protect and restore the Delaware River watershed's natural environment to ensure there is an adequate supply of clean water for generations to come. The Brodhead and other sub watersheds of Monroe County are major factors in the health of the Delaware and drinking water for millions of people. ***www.williampennfoundation.org***