

Instructional Scenario

Managing River Health



Course/Duty Area: Introduction to Natural Resources & Ecology Systems/Protecting Water Resources

Scenario:

Mr. Smith owns and operates a 275-acre cow-calf operation in Clarke County, VA. The property runs alongside the Shenandoah River for half a mile, with a tributary running through the pasture. He has been interested in creating a management plan to help improve the health of the river but doesn't know where to begin. He has recruited your help, as a conservation specialist with the local Soil and Water Conservation District, to guide him and establish a plan.

Currently, his cattle have access to both the stream and the Shenandoah River, as well as all the pastureland. Before creating the management plan, Mr. Smith must first test the water from both the stream and the river to establish baseline data and understand what areas need to be changed to have a positive impact on the river's health.

As the Soil and Water Conservation District's conservation specialist, take the above information, the water test indicators, and using best management practices (BMPs), create a management plan for Mr. Smith's farm.

Big Question:

How will you create a management plan for Mr. Smith's farm? What factors need to be considered when developing the plan to improve the water health of the Shenandoah River?

Focused Questions:

- What factors impact water health?
- How can water health be impacted by surrounding areas?
- What are *best management practices (BMPs)*?
- How do riparian buffers affect water health?
- What are the different zones in riparian buffers, and what role do they play?
- What impacts does agriculture have on local ecological systems?

Student Project or Outcome:

Students will first test two water samples that simulate the water from the river and stream; these can come from two local water sources or can be manipulated using organic material to replicate excess nutrient levels in the water tests. Students will then develop a comprehensive plan for Mr. Smith's farm, using the information provided and water health data to best support his goal of improving the health of the river and stream.

Project-Based Assessment:

- If feasible, students can travel to a local farm that has natural water sources and use that water's testing data to create a management plan to improve water health
- Students can present their management plans to local extension agents or Soil or Water Conservation District (SWCD) specialists.

Teacher Resources:

- [Soil and Water Conservation](#), Virginia Department of Conservation and Recreation

- [Riparian Buffers and Clean Water](#), Chesapeake Bay Foundation
- [Rotational Grazing- And How It Impacts Water Quality and Grass-Fed Beef](#), Cumberland River Compact
- [Friends of the Shenandoah River](#)

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