



Adopt-A-Stream Habitat Assessment: A Virtual Experience



LEARNING OBJECTIVES

- Students will increase their knowledge of stream characteristics or parameters that determine the overall health and stability of a stream.
- Students will conduct a habitat assessment of streams in Gwinnett using a virtual format.
- Students will complete inquiry-based research to increase their knowledge of stream restoration and the negative impact of urban development on stream health.
- Students will complete inquiry-based research to determine possible solutions for remedying streams with poor health.
- Students will propose action plans for stream maintenance or stream restoration.

BACKGROUND

Water is one of our most valuable resources. Gwinnett County depends on waterways like streams, rivers, and Lake Lanier for drinking water, agriculture, industry, recreation, and to provide a rich, stable habitat for plants and wildlife. For this reason, it is important to maintain the health of our waterways.

Over the past 50 years, Gwinnett County has experienced historic growth. Nearly 50% of Gwinnett County has been developed since 1974 leaving only 19,000 acres of undeveloped land within the county. Gwinnett County residents reside in the Chattahoochee, Oconee, and Ocmulgee watersheds. A watershed is a land area over which all the water, sediment, and dissolved materials flow and drain into a larger body of water like a stream, river, or lake. Stream health and stability is negatively affected by urbanization within our watershed.

With urbanization comes the increase of impervious surfaces. Impervious surfaces are hard, non-porous surfaces such as roads, driveways, parking lots, runways, sidewalks, and roofs. These surfaces are problematic for our watershed because they create increased stormwater runoff and flooding, compromise water quality, and can affect stream health and stability.

CURRICULAR CONNECTIONS

Gwinnett County Public School Academic Knowledge and Skills – Biology/AP Biology

- Obtain, evaluate, and communicate information on how changes in the environment have contributed to speciation and biodiversity.
- Obtain, evaluate, and communicate information to assess the interdependence of all organisms on one another and their environment.

Georgia Standards of Excellence – Biology

- SB5 Obtain, evaluate, and communicate information to assess the interdependence of all organisms on one another and their environment.
 - SB5.a Plan and carry out investigations and analyze data to support explanations about factors affecting biodiversity and populations in ecosystems.
 - SB5.c Construct an argument to predict the impact of environmental change on the stability of an ecosystem.
 - SB5.d Design a solution to reduce the impact of a human activity on the environment.

Georgia Standards of Excellence – AP Environmental Science

- SEV4 Obtain, evaluate, and communicate information to analyze human impact on natural resources.
 - SEV4.a Construct and revise a claim based on evidence on the effects of human activities (i.e. agriculture, forestry, ranching, mining, urbanization, fishing, water use, pollution, desalination, wastewater treatment) on natural resources (i.e. land, water, organisms).
 - SEV4.b Design, evaluate, and refine solutions to reduce human impact on the environment including, but not limited to, smog, ozone depletion, urbanization, and ocean acidification.

Georgia Standards of Excellence – CTAE: Career Cluster: Agriculture, Food, and Natural Resources – Environmental Science & Stewardship

- AFNR-ESS-9 Analyze water quality and its importance in aquatic ecosystems.
 - AFNR-ESS-9.1 Understand water quality by researching parameters defining quality water and analyze water to determine its condition.

Possible Essential Questions:

- What parameters determine if a stream habitat is healthy or impaired?
- What methods can we use to restore an impaired stream?
- How does human development impact stream health and stability?
- How can we redesign existing impervious surfaces within our watershed to reduce negative impacts on stream health and stability?
- How can we incorporate sustainable materials into future development designs or projects to protect nearby streams within Gwinnett?

LESSON PLAN

STEP 1:

Students will learn how to assess a stream's habitat via the Georgia Adopt-A-Stream: Stream Habitat Survey – Full Reference Guide. Students will become familiar with this guide in order to learn about the 10 stream habitat parameters, what to look for, why they are important, and how to score them.

[Stream Habitat Survey – Full Reference Guide](#)

This link will take you to the “Monitoring Resources” page on the Georgia Adopt-A-Stream website. Scroll down to “Visual Monitoring” and select the “Stream Habitat Survey – Full Reference Guide.”

STEP 2:

Students will virtually tour two Gwinnett streams and complete stream habitat surveys for each stream.

[Virtual Stream Tour Webpage and Survey Activity Instructions](#)

Use this link to access the two Gwinnett County virtual stream tours and accompanying activity directions and materials. We suggest downloading the Stream Habitat Survey form and providing two copies to each student.

STEP 3:

Students will analyze data from each stream to determine overall stream health. Next, with a partner or group, they will compare results to determine accurate scoring. Discuss and defend scores using evidence. Share with the class.

STEP 4:

Research solutions to improve stream habitat health (i.e. habitat restoration, land use, green infrastructure innovation, sustainability practices) ***If completing the optional extension portion of this lesson, please skip to the extension section now.**

STEP 5:

Create a presentation to share findings and recommendations for stream habitat restoration or maintenance for virtual streams.

EXTENSION (OPTIONAL):

STEP 5:

Using the Georgia Adopt-A-Stream: Stream Habitat Survey, students will conduct a stream habitat assessment of an on-site or nearby stream.

STEP 6:

Students will complete a [Site Sketch](#) of the area surrounding the stream (i.e. buildings, paved surfaces, trails, fencing, picnic table, sports field, roads) that could be impacting the stream's health. (To access the Site Sketch data sheet, click on the provided link, scroll down to “Visual Monitoring,” and select “Site Sketch.” Download the PDF.)

STEP 7:

Students will analyze and compare data and determine the health of the on-site stream.

STEP 8:

Research solutions to improve or maintain stream habitat health (i.e. habitat restoration, land use, green infrastructure innovation, sustainability practices)

STEP 9:

Students will recommend a plan of action designed to improve and/or maintain the health of the stream (i.e. habitat restoration, land use, green infrastructure innovation, sustainability practices).

RESOURCE LIST

[Adopt-A-Stream Georgia Website](#)

[Monitoring Resources | Georgia Adopt-A-Stream \(Habitat assessment reference guides\)](#)

[How Impervious Surface Impacts Stream Health](#)

[Gwinnett Water Resources | Pervious Pavement](#)

[EPA's How's My Waterway? Website](#)

[Gwinnett County Sustainable Infrastructure Guide](#)

[Gwinnett County Land Use Guide](#)

CONTACT INFORMATION

For more information or instructional support, please contact us at DWRSchools@GwinnettCounty.com.

In your email subject line, please write: ATTN: (Insert name of one of the following Gwinnett Water Resources staff members):

- John Butler, Outreach Manager
- Lexie Inserra, Education Associate
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- Chrissy Rubel, Conservation Coordinator

