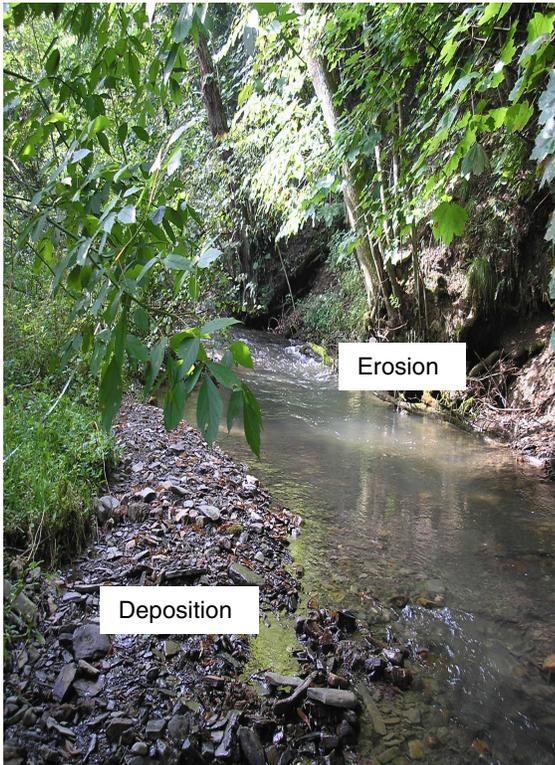


### What is sediment and how does it affect aquatic animals?



Sediment is natural earth material. It consists of soil particles of all sizes ranging from the smallest, “silt (mud) and sand”, to larger sizes which include the gravels, cobbles and boulders. Sediment also includes extremely hard and very large materials (bedrock) and very small tightly compacted materials (clay). All of these materials succumb to the forces of erosion from water, wind and pressures caused by expanding and contracting forces. A stream contains a certain variety of sediment based upon its geology, topography, precipitation rates and other factors in the watershed. The study of the land and water interactions is called “**fluvial geomorphology**”.

#### If sediment is natural, then what is the problem?

The answers are both simple and complicated. All streams carry a certain sediment load. They are able to move this sediment through the watershed and deposit it either periodically or permanently in many places. This same sediment movement also causes erosion. These depositional and erosional processes are responsible for the wide variety of shapes (patterns and profiles) of our streams. Healthy streams maintain their basic shape for long periods of time, much

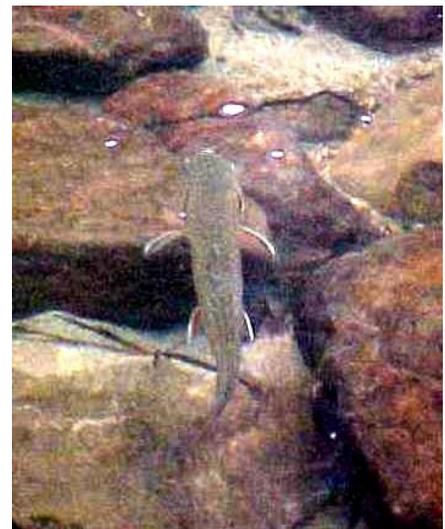
longer than our life spans. It is important here to understand that there is change, but the change does not affect the streams basic shape, which tells us that the stream is behaving the way it should.

#### What does this mean to the life of the stream?

There are a wide variety of plants and animals that make our streams their home; and, many more, including us, are dependent upon the survival of these plants and animals. All life requires the same basic ingredients; a safe place to live and raise a family, sources of food and a healthy environment surrounding and protecting them. Streams provide all these things and more, especially healthy streams of the **Appalachian Mountains**, which are earth's oldest mountains and they support a wonderful diversity of aquatic life.

Sediment has both direct and indirect influences upon the stream ecosystem (the community of animals, plants and microorganisms and the interrelated physical and chemical environment). Here are some examples of effects that too much sediment can have.

- The physical nature of sediment movement causes scouring and deposition. Scouring moves materials and dislodges small animals and deposition (burring) smothers the animals, especially those that live between the small spaces on the bottom of the stream. We use the term embeddedness to describe this burring effect. **Embeddedness** occurs when larger sized particles such as gravel, cobble and boulders, are being



Our native brook trout need clean cool water with little variation in turbidity and sediment composition, or changes to their habitat.

## The Mountain State Monitor

surrounded by much smaller silt and sand. If the deposition continues, much less space is available for the animal and plant life, but more dangerous than that is the animal's may suffocates or there is interferences with their food intake. 

- There is both suspended and bedload movement of sediment. The bedload changes, resulting in shifts to the depositional features of the stream, and if there are too many shifts or too much deposition, embeddedness can occur. The suspended materials are much smaller and move within the water column. Small particles are moving and settling all the time, but with higher velocity many of our streams rapidly become very muddy (turbid). Streams that have wide riparian buffers protecting them from the surroundings are much less likely to show rapid increase in turbidity and will return to a normal clarity much sooner. If turbidity continues it can have a dramatic impact on the life of the stream. Muddy water reduces light penetration decreasing the plant communities' ability to **photosynthesize**. This basic process (primary productivity) is very important; it creates the building blocks on which all other forms of aquatic life depends.
- Certain chemical pollutants bind to sediment as it washes across the land during rainstorms. If these pollutants have a direct path to our streams, they can very rapidly change the water quality. These chemicals are often dangerous to small animals and plants as well as larger forms of life. If the processes continue the stream will not be able to support life for long periods of time, nor will it be any benefit for water supply, recreation or aesthetic purposes. 

### What can we do?



Potomac Stream Samplers explore the aquatic life of Spring Run in Grant County.

The first step is to ask yourself; how do my activities affect my local streams and what can I do to help or learn more. Getting involved with local watershed or community organizations, or forming one if they do not exist is a good start. Research information about your local streams and ask the professionals for more information and for their assistance. Maybe even begin the learning process with a monitoring program to help you become closely acquainted with your stream.

Our streams deserve our time and attention. We all are responsible for their condition and we all can do our part to preserve them for the future.

For more information about our state's streams, visit the WV Save Our Streams website at: <http://www.dep.wv.gov/sos>, E-mail the **Coordinator** or write to **Save Our Streams** at the address below.

WV Department of Environmental Protection  
601 57<sup>th</sup> Street, SE  
Charleston, WV 25304



Promoting a Healthy Environment