

Lesson 4: SEDIMENT – TOO MUCH IS BAD

Setup an S channel with 2 bends as in lesson 2, “Vegetation – It’s Doing A Job.” Start moderate flow.

Use flip chart illustration



SEDIMENT

Clay
Silt
Sand
Gravel
Rock

} Moved
By
Water



“What is Sediment? - Sediment is any soil or rock material that is carried or deposited by water. It varies in size from tiny clay particles, too small to see, to rocks as big as a house. You need high velocities to carry large particles like boulders.”

“Sediment is the number one pollutant of our surface waters. Sediment can smother aquatic organisms that are food for fish and make streams and lakes muddy.”

Point out particles being carried along by the flow in the stream model. Point out deposition in point bars and delta formation.

“How far does sediment move? Does one particle just follow the flow all the way from one end of the pan to the other?”

Answer: “No – usually they will get captured in a point bar or elsewhere for a while.”

Shake up bottle with sand, and silt. Hold still to let settle.



Bottle of soil and water.

“When sediment is carried by water it usually settles out according to size just like in this bottle. The bigger particles settle first. Can you see the sand, silt, and clay? Which settles first? How long does it take for each to settle to the bottom? In flowing water, how far does sand move? Silt? Clay? The finer clay can move all the way to a lake, making it ugly and less productive. The silt and sand take longer to travel and as a result they can clog creeks and streams.”

Next flip chart

“Bare soil in the watershed is the main source of sediment. Without good plant cover, the rain will pound on the soil. The impact of rain is like millions of tiny explosions per acre. Each one blasts loose particles and washes them into nearby creeks.”

Next flip chart.

“Sediment smothers the insects and other animals that fish need for food. It also smothers the eggs of stream fish and the newly hatched fish. Some game fish like white bass and smallmouth bass depend on clear streams for spawning- sediment clogged streams mean fewer fish to catch.”



Show bottle with gravel.

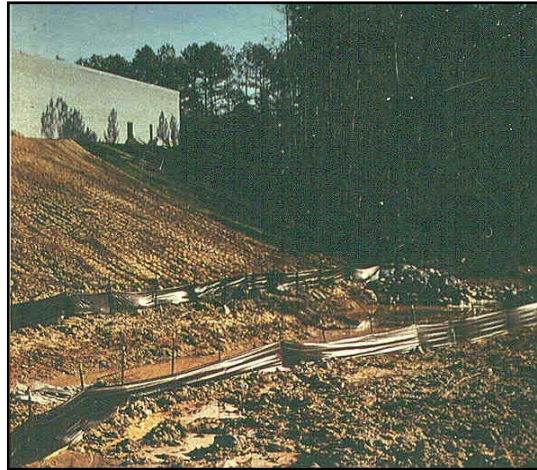
“Rocky bottom creeks are great places for insects and newly hatched fish to live, because they can find shelter in the spaces between rocks and gravel. If sediment fills these spaces it’s ‘goodbye to good fishing’.”

Place construction equipment on upland area and surround by silt fence. Install the fence along the contour. Be sure to bury the bottom so sediment cannot go under the fence! Place silt fence sign.



Installation of silt fence.

Next two flip charts



“Silt fences are installed along the downhill side of building and road construction sites to slow down runoff and trap sediment.”

Place tractor and implements on a different site and surround the “crop field” by filter strips (green outdoor carpet stripe) on downhill sides. Place filter strip sign.

Next flip chart.

“Sediment from plowed fields can be kept out of the creek by using filter strips. These grass strips capture sediment. The grass slows down the runoff and lets sediment settle out.” What happens if there is too much sediment settling out in a filter strip? What if there is too much flow from the field into the filter strip?

Answer: “If too much sediment gets into the filter strip, it will divert the flow and cause erosion in another direction. If there is too much flow across the filter strip, it will erode.”

Next flip chart.



“If there is too much sediment in the stream, it will settle out in the channel. (This happens when there is erosion occurring somewhere in the watershed.) Where will it the sediment settle out? Answer: it will settle out anywhere that the flow slows down, usually on the inside of bends.”

“Example: Inside of a bend the flow is slower than at the outside of a bend. Settling occurs here first. It may also occur directly above any obstruction in the stream, like at a bridge, a culvert, dead tree, etc.”

“When there is a lot of extra sediment in a stream, from erosion problems upstream or in the watershed, settling occurs in the middle of the stream. This forms mid-channel bars and even islands. Any obstruction in the channel will cause the development of mid-channel bars”.

“Mid-channel bars are a sign that there is too much sediment entering the stream.”

Place mid channel bar in stream. This works best if streambed is bare or nearly so.



“Notice what happens to the banks near the mid-channel bar? The mid-channel bar directs the water against the banks. This causes extra erosion of the banks. Anytime you see a mid- channel bar it is a sign that the stream is getting too much sediment.”

“Any obstruction, including mid-channel bars, will cause erosion of the banks.”

Conclusion:

“Bulldozers and farm tractors are powerful tools. People need to use them with care to keep sediment out of streams. Otherwise we can ‘say goodbye’ to good fishing and ‘hello’ to serious bank erosion.”