

# In-Stream Defense

Streambed mats capture disturbed sand, silt and clay from New York state construction sites, protecting trout-filled waters

By Wayne Rozen

**S**edimat, a patented tool for the protection of streams from sedimentation during in-stream construction activities such as right-of-way access road

installation, was developed and tested under field conditions at eight different streams in central and western New York state. The amount of fine sediment (sand,

silt and clay) in the streambed immediately downstream from the work sites was measured before and after the construction.

At seven of the sites, the disturbance was the excavation of a 4-ft-deep trench for the installation of a natural gas pipeline which was followed immediately by backfilling. At the eighth site, the disturbance was extensive hand digging by shovel. These streams varied in width from 10 to 75 ft and in depth from 6 to 24 in. Velocities ranged from 0.8 to 3.3 ft per second. Trout were present in most of the watersheds, if not at the test sites specifically.

Before construction, the average percent of sediment fines in the streambed just downstream of the work site was 12.2 percent. After construction, it rose slightly to 14.7 percent. Both concentrations of sediment represent levels conducive to trout reproduction (egg survival).

In contrast, there were locations at six test streams that were subject to the disturbance but which were not protected by the mats. These were primarily areas between the edge of the trench and the upstream edge of the mats, or off to a side where mats were purposely not laid.

After construction, the average



Individual mats captured between 500 and 1,000 lb of sediment each.

percent of sediment fines at these unprotected sites rose from 11.5 to 24 percent. This post-construction level of sedimentation is an amount which has been repeatedly documented to cause major declines in trout reproductive success. A comparison of the two before-and-after sediment concentrations indicates that the mats trapped about 80 percent of the disturbed sediment and prevented or minimized adverse impact to trout reproduction.

Individual mats were able to trap and remove between 500 and 1,000 lb of sediment each and did not interfere with construction operations. Because they were laid flat on the streambed, they were not affected by water velocity, nor did they raise water levels and thus flood the work area.

## Installation

The mats should be installed flat on the streambed immediately before in-stream activities are scheduled to occur. The 4-by-10-ft pads should be placed as close to the disturbance as possible without getting in the way of operations. It is wise to discuss mat placement with equipment operators, foremen and others involved in the project so that the mats do not interfere with or become damaged by construction equipment.

The mats may be held in place with either stones or stakes. It is important to ensure that the upstream edge of each mat is in contact with the streambed. If the upstream edge is not tight to the streambed, sediment moving along the bed will simply pass under the mats and not be trapped. Flat stones laid along the upstream edge of the mats work well at holding the edge of the mat down.

The number of mats that protect a site will depend upon stream width, water velocity, distribution of the sediment fines and the amount of disturbance. Faster-moving water requires a greater area of



*Stones or stakes may be used to hold the mats in place.*

coverage than slower-moving water. Streambeds with silt and clay instead of sand and gravel require more coverage. Sedimat is designed primarily for coarse-bottomed streams and is most effective at trapping sand.

## How it Works

The sediment control product may be placed either parallel or perpendicular to the current. If the current below the work area is too fast, the mats should be moved downstream to the first slow spot. Sand will pass through the excelsior and into the burlap, where it forms a sand lens. Additional sand is trapped in the excelsior and forms sand bars on top of the mats when the interiors are full. At water velocities greater than 3 ft per second, the current is too strong for sand bar formation.

Individual mats can absorb 1,000 lb of sediment. When silt

settles out on top of the mats, removal of the mats must be done with care to avoid displacing the silt.

Once removed, the mats can be arranged burlap-side down on a disturbed bank and staked in place. Seeding and mulching can be done right over the top of them. The seed will germinate in the mats and send roots down into the soil below. The wooden stakes may be cut away with a knife after the mats have been removed. **SWS**

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