



SEDIMAT[®]

CASE STUDY: patented in-stream sedimentation control device (4' x 10' mat size)

SEDIMAT[®] (patented) is an effective tool for the protection of streams from sedimentation damage during instream construction activities such as ROW access road installation. It is a flat 4' by 10' pad which is laid singly or in multiples on the streambed immediately downstream of the worksite. Sediment disturbed by construction is carried along the streambed by the current until it encounters SEDIMAT. The sediment then settles through the upper layer of jute mesh and into a layer of excelsior. A lower layer of burlap prevents the sediment from escaping. After construction is complete, the mats are removed and staked to the streambank. They are seeded, mulched, and provide immediate streambank stabilization. Because the mats are entirely biodegradable there is no need for disposal. The sediment mixed with the rotting excelsior provides a seedbed for germination and growth of the seed mix.

SEDIMAT is packaged individually and is easy to store, handle and transport. It can be installed on a streambed using either stones or stakes and can be placed in any configuration or number to provide desired coverage. It may be used alone or in conjunction with other methods of stream protection such as coffer dams, culverts, haybales or silt screen.

BACKGROUND

SEDIMAT was developed and tested under field conditions at eight different streams in central and western New York State during 1992. 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 four foot 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 feet and in depth from 6 to 24 inches. Velocities ranged from 0.8 to 3.3 feet 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%. After construction, it rose slightly to 14.7%. 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 percent of sediment fines at these unprotected sites rose from 11.5% to 24%. 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 the mats trapped about 80% 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 lbs. 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. SEDIMAT is a valuable tool for stream protection due to its low cost, simplicity, versatility and effectiveness.

INFIELD OBSERVATIONS

SEDIMAT may be placed either parallel or perpendicular to the current. If the current below the work area is too fast move the mats 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 of greater than 3 fps, the current is too strong for sand bar formation. Individual mats can absorb 1,000 lbs 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 SEDIMAT. 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.