Article 146

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Coconut Rolls as a Technique for Natural Streambank Stabilization

Eroding streambanks are a ubiquitous problem along urban streams. Traditional solutions have involved hard engineering methods such as rip-rap, channelization, and retaining walls to secure the banks. It was reasoned that only hard material could withstand the enormous erosional energy that occurs during large storm events. Unfortunately, hard engineering techniques are often detrimental to the streamside ecosystem and may be less than satisfactory in controlling erosion.

Natural alternatives to streambank stabilization have their weak points as well; for example, willow stakes planted directly into an eroding bank may not withstand large storms. However, there is a fairly new method on the market for controlling erosion by the use of rolls made of natural coconut fiber.

A key design issue for streambank stabilization is how to physically protect the bank from erosion until the vegetation has become fully established. One solution is to use rolls of coconut fiber (also known as coir rolls) along the toe of the bank. The coconut roll acts as a flexible but resistant foundation for streambank plantings (Figure 1). Fiber rolls are initially plugged with native hydrophytic plants and then laid along the toe of the bank where they retain water and nutrients. The coir rolls eventually degrade but give plants enough time to form a dense network of intertwining roots that holds the bank (Figure 2, A and B).

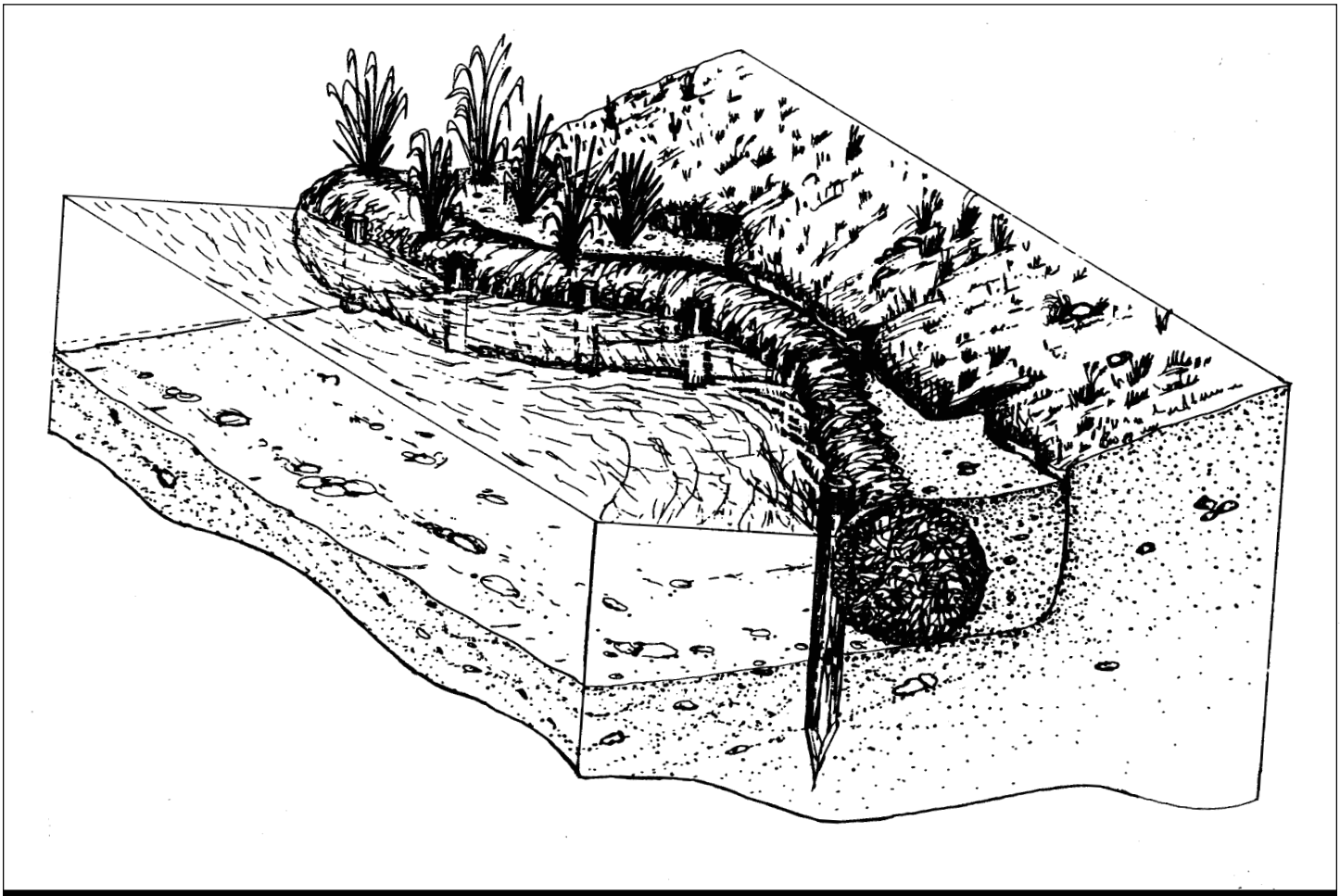

Figure 1: Placement of Coconut Roll Along Toe of Bank *(drawing courtesy of Bestmann Green)*