

Bank Stabilization Rules

Env-Wt 514 BANK/ShORELINE
STABILIZATION: ALL PROJECTS



Bioengineered bank
stabilization project
Dead Diamond River
Dartmouth College Grant



New Rules!

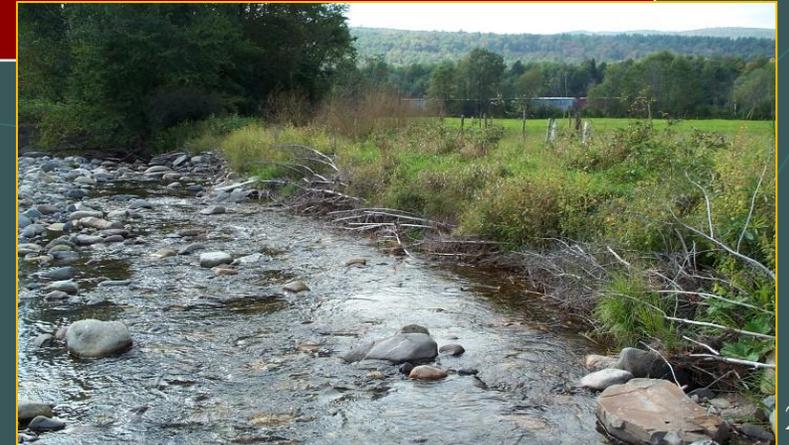
Env-Wt 514.01 Purpose. The purpose is to establish requirements that apply to all types of bank and shoreline stabilization projects, and to maintain or restore healthy and vegetated bank and shoreline system functions that will:

Hold soils together, stabilize banks and shorelines, and provide structural erosion control.

Establish stable and sustainable ecosystems to provide high biological diversity and complexity to support fish and wildlife habitats.

Ensure runoff filtering and effective sediment-trapping functions, so that sediments settle out before nutrients and pollutants are carried into surface waters.

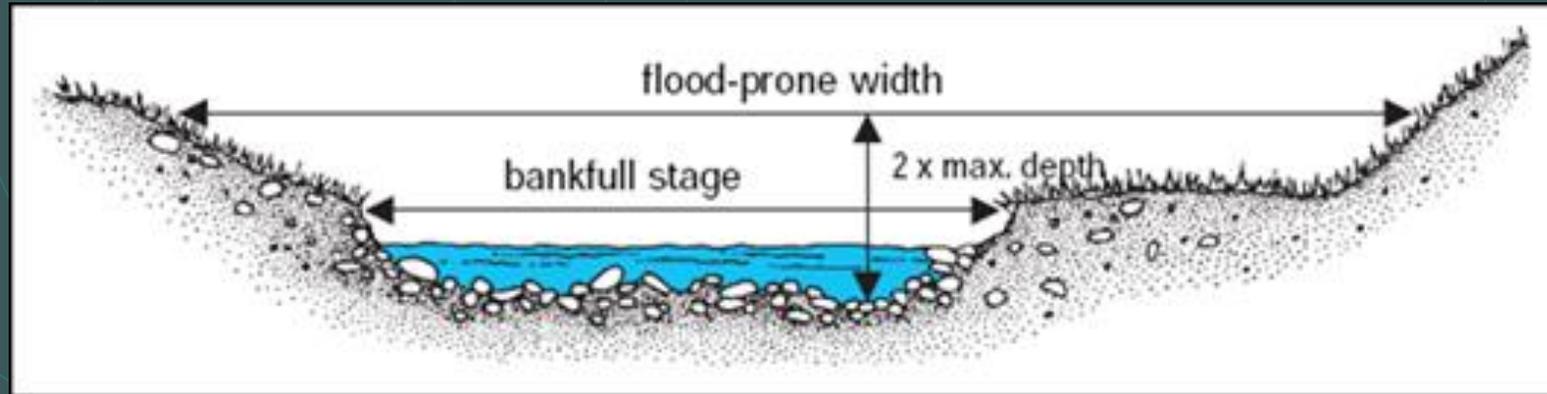
Provide flood abatement functions by trapping sediment during floods and slowing velocity of floodwaters.



Current Rules

- ✓ Definition of “Bank” did not change!

Env-Wt 102.15 “Bank” means the transitional slope adjacent to the edge of a surface water body, the upper limit of which is usually defined by a break in slope, or for a wetland, where a line delineated in accordance with Env-Wt 400 indicates a change from wetland to upland.



Current Rules

PART Env-Wt 404 CRITERIA FOR SHORELINE STABILIZATION

Env-Wt 404.01 Least Intrusive Method

Shoreline stabilization shall be by the least intrusive but practical method.

Least Intrusive Method
Hierarchy

Env-Wt 404.03
Vegetative Stabilization.

Env-Wt 404.04
Rip-rap.

Env-Wt 404.05
Walls.



New Rules

Env-Wt 514.02 Approval Criteria for All Bank/Shoreline Stabilization Projects.

Hierarchy of Bank
Stabilization Practices

Soft vegetative bank
stabilization.

Bioengineered bank stabilization
or naturalized design techniques.

Semi-natural form design.

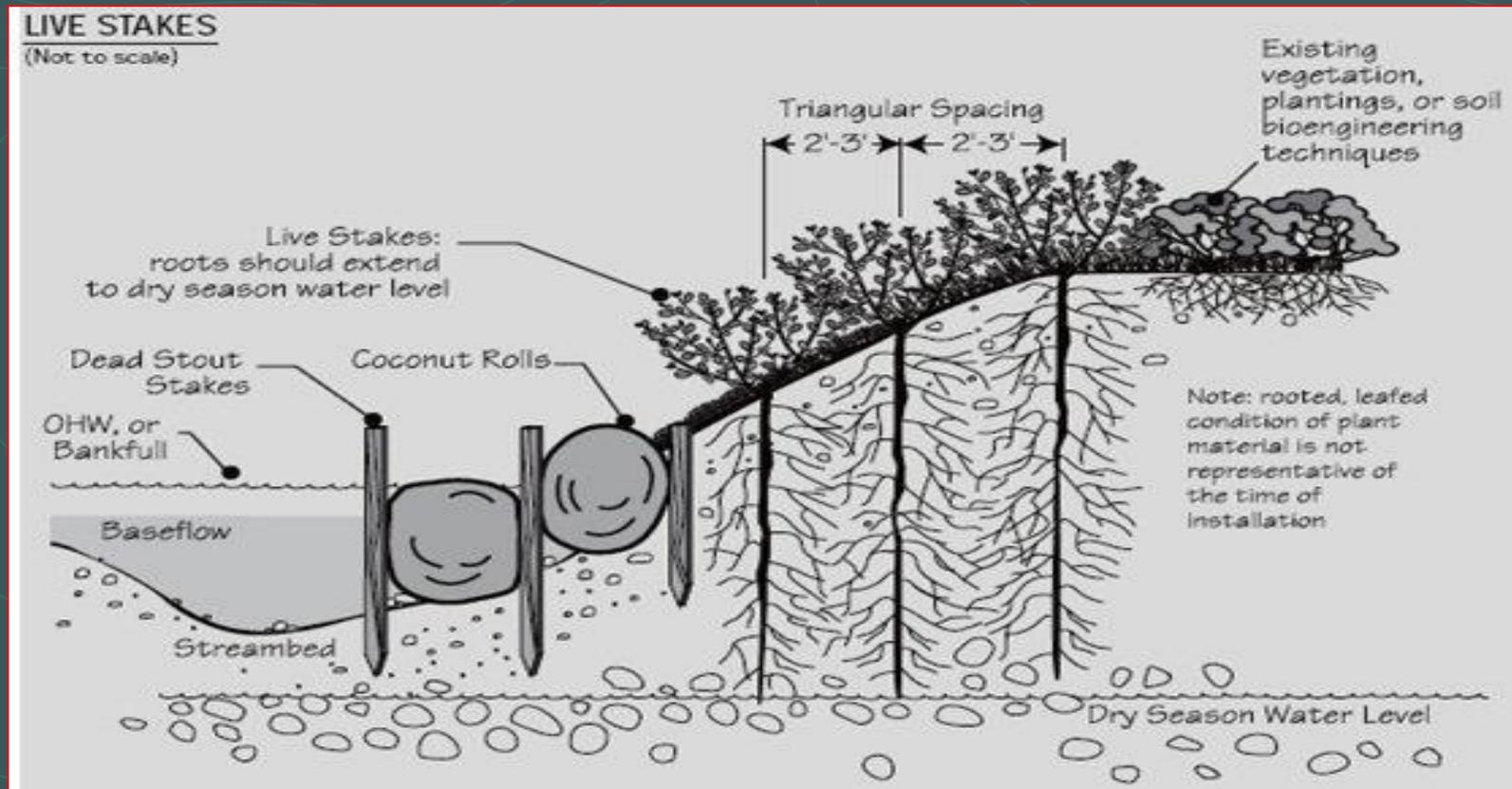
Hard-scape or rip-rap design.

Wall construction.



New Definitions

Env-Wt 102.26 “Bioengineered bank stabilization” means a design method that uses live vegetation and woody material in combination with natural and synthetic materials for slope stabilization, erosion reduction, and vegetation establishment. The term includes soft vegetative stabilization and bioengineered stabilization.



New Definitions

Env-Wt 104.23 “Soft bank stabilization components” means deformable materials used in soft vegetative or bioengineered bank stabilization. The term includes but is not limited to coconut fiber rolls, jute mats, live plantings, and logs.



New Definitions

Env-Wt 103.15 “Hardened shoreline” means a shoreline that is covered with materials such as rocks or walls, so as to deflect rather than absorb wave and current energy.

Env-Wt 103.50 “Ordinary high water mark” means the line on the shore, running parallel to the main stem of the river, established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the immediate bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.

Where the ordinary high water mark is not easily discernable, the ordinary high water mark may be determined by the department of environmental services.



New Project Classifications

Env-Wt 514.07 Bank Stabilization Construction Project Classification

Minimum Impact Projects

The stabilization project impacts less than 50 LF of a bank, and is being done during low flow with no in-channel work, and has been designed by a CWS or a PE,

or

The project uses soft vegetative bank stabilization, bioengineered bank stabilization, or semi-natural form of less than 200 LF of bank impact, and has been designed by a PE, and when the applicant participates in a pre-application meeting, and the application is submitted through the minimum impact expedited review process,

or

The project is for repair of an existing retaining wall that is done in the dry; and results in no change in height, length, location, or configuration; and adds no more than 6 inches of width.

New Project Classifications

Env-Wt 514.07 Bank Stabilization Construction Project Classification

Minor Impact Projects

The project impacts less than 50 LF and exceeds the minimum impact criteria,

or

The project is a bioengineering project that is 200 LF or greater when designed by a professional engineer,

or

The project is for any other bank stabilization project that is 50 LF or more to less than 200 LF in length,

or

The project is for a semi-natural design bank stabilization project of less than 200 LF in length, and where greater than 75 percent of the project is designed using soft bank stabilization components that includes natural plants, dormant stakes, fiber rolls, and native wood logs.

New Project Classifications

Env-Wt 514.07 Bank Stabilization Construction Project Classification

Major Impact Projects

The project is a semi-natural design bank stabilization project of 200 LF or greater or where greater than 25 percent of the project is using hard scape components,

or

The project is for any other project that exceeds the minor bank stabilization criteria.



Soft bank stabilization/ bioengineered examples

Techniques used:

Hardwood bundles.

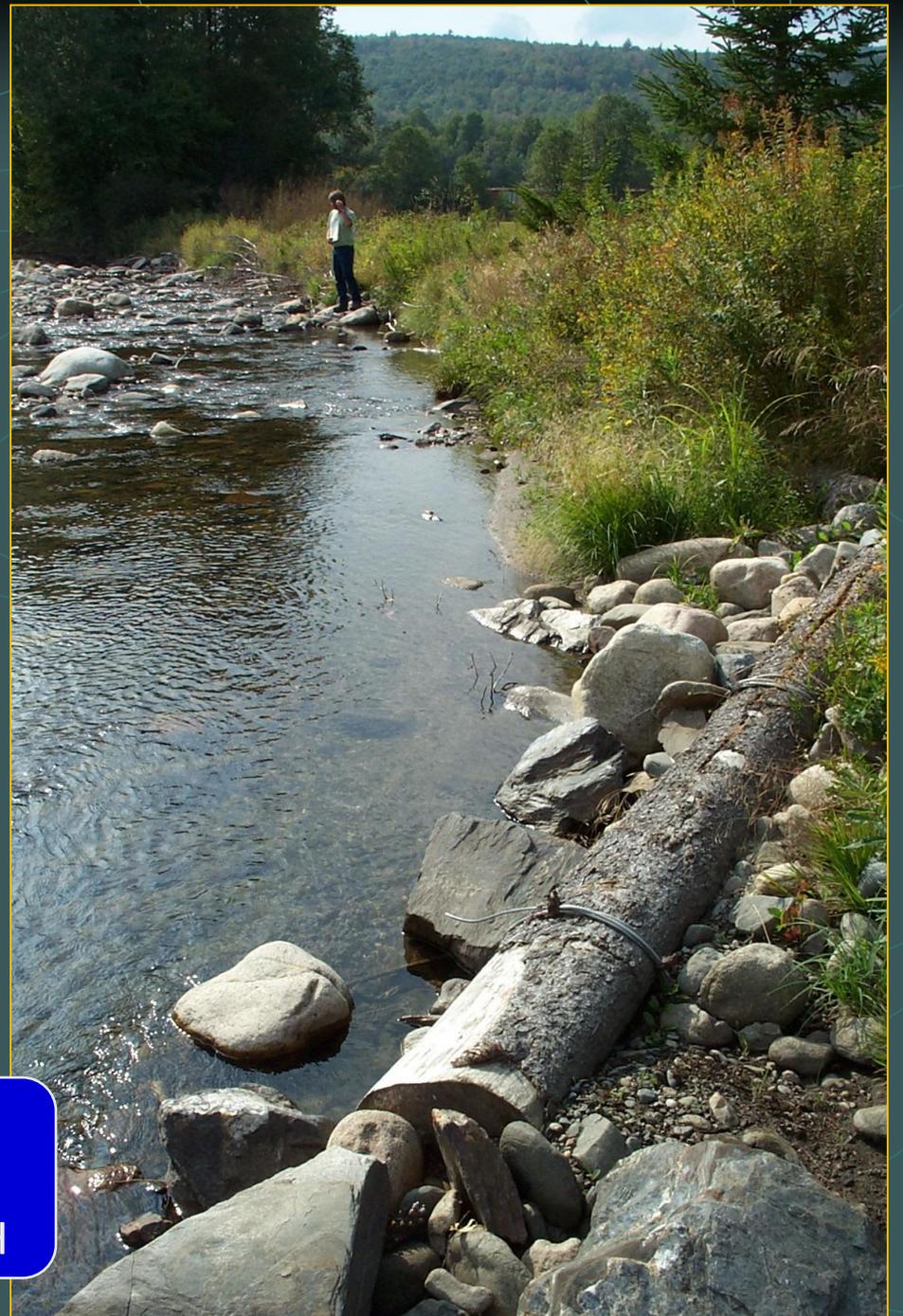
Softwood bundles.

Coconut fiber rolls.

Cabled spruce logs.

Bank plantings.

NRCS Project
Cone Brook
Columbia, NH

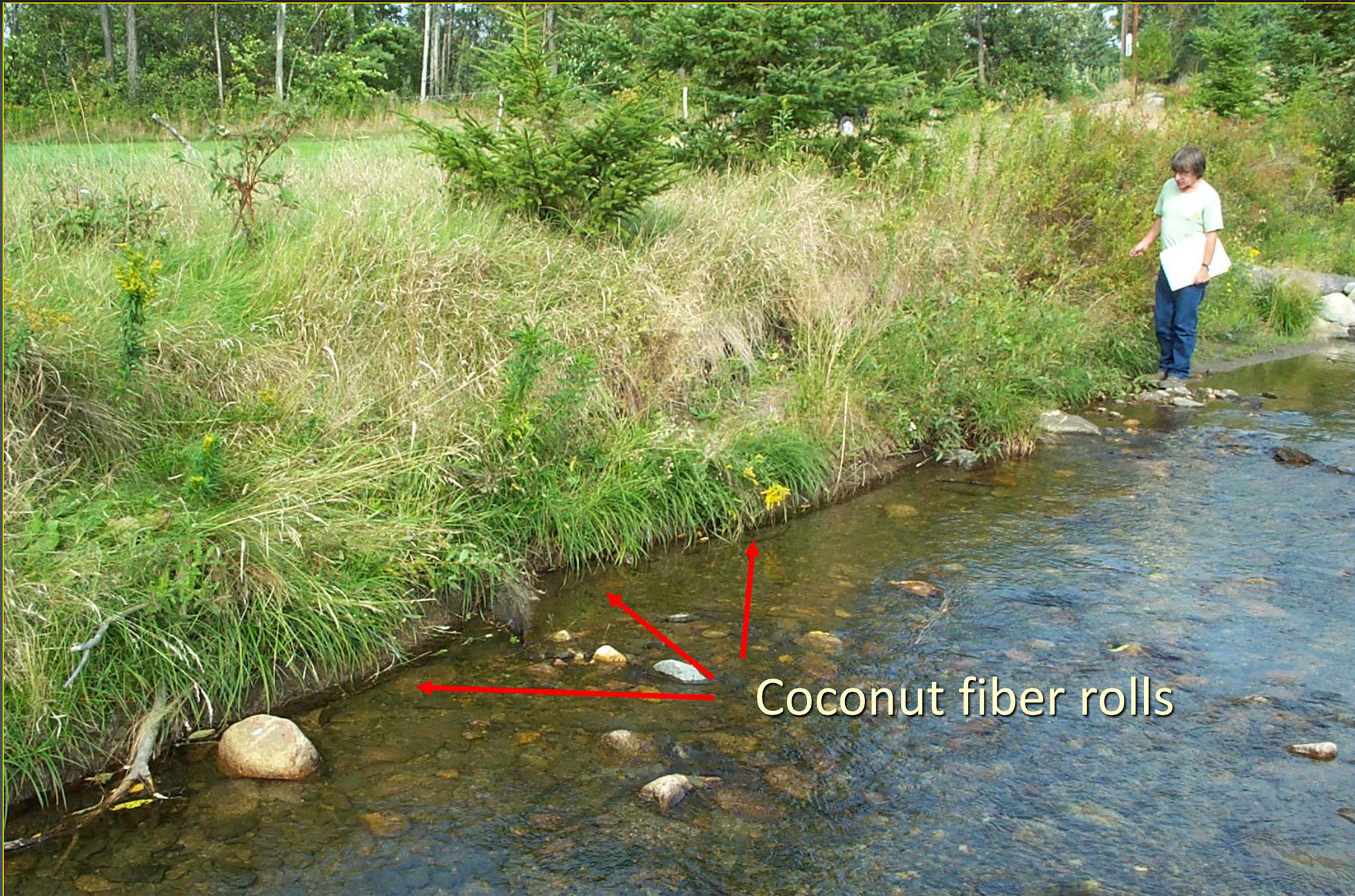




Bank plantings

Spruce trees cabled into streambank to deflect the thalweg away from the toe of the bank.

Thalweg = deepest part of the channel.



Coconut fiber rolls

Soft bank stabilization/ bioengineered examples



Dartmouth College Grant
NRCS Project
Dead Diamond River

Fish lunker logs





Live fascines - dogwood

Undercut fish lunger



Post construction, Sept 2000



Aug 2017



Post construction, Sept 2000



Aug 2017



Post construction, Sept 2000



Aug 2017



Almost 2 decades of successful stabilization adjacent to the roadway!

Smith River, Bristol



Headwaters
Hydrology, PLLC



Brush layering
dormant alder and
dogwood.

Post - one growing season



Post - one growing season



New Monitoring Requirements

Env-Wt 514.06 On-Going Requirements for All Bank/Shoreline Stabilization Projects. The owner shall monitor the project and take corrective measures if the area is inadequately stabilized or restored by:

Replacing fallen or displaced materials without a permit, where no machinery in the channel is required.

Identifying corrective actions and follow-up plans in accordance with Env-Wt 307 (*conditions applicable to all activities in jurisdictional areas*).

Filing an appropriate application and plans where work in the channel is required.



Required Guidance/Reference Documents

Env-Wt 514.02(d) Stream bank-stabilization project plans shall be developed in accordance with the following techniques, as applicable:

Guidelines for Naturalized River Channel Design and Bank Stabilization



New Hampshire
Department of Environmental Services
Department of Transportation

February 2007

USDA, NRCS

Technical
Supplement 14I

Streambank Soil Bioengineering



(210-VI-NRCS, August 2007)

Additional Helpful Documents



A Soil Bioengineering Guide *for Streambank and Lakeshore Stabilization*

USDA, NRCS



White Paper

River Restoration and Fluvial Geomorphology



New Hampshire
Department of Environmental Services
Department of Transportation

May 2006

Is this bioengineered or soft bank stabilization?



Hard-scape

Modified definition:

Env-Wt 104.09 "Rip-rap" means a layer of angular stones placed on a slope to prevent erosion, scour, or sloughing of the slope.

How does an applicant demonstrate that hard-scape design or rip-rap is necessary to stabilize the bank?

Per Env-Wt 514.02(c)(4) Hard-scape or rip-rap design shall be allowed only where anticipated turbulence, flows, restricted space, or similar factors render vegetative, bioengineering, semi-natural form design and diversion methods physically impractical and where necessary to protect existing infrastructure.

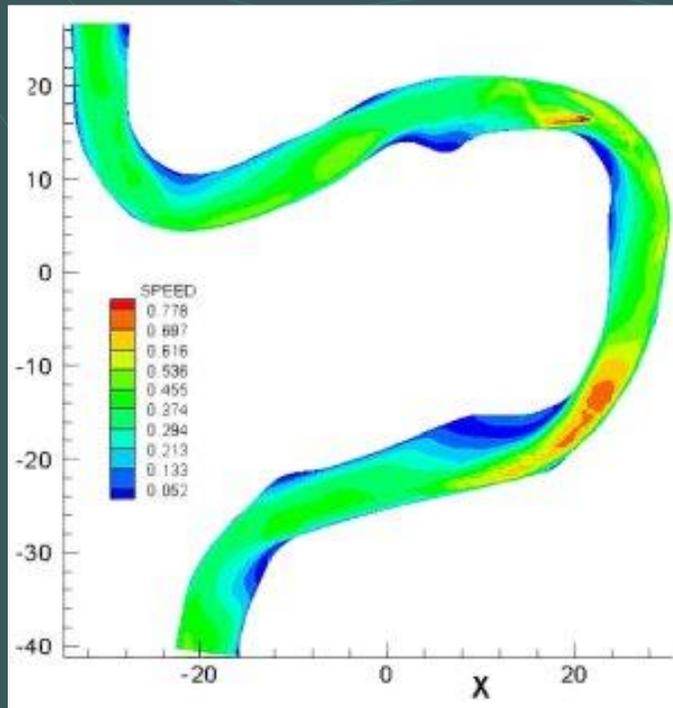
Peabody River, Gorham



Hard-scape design or rip-rap design

Engineering considerations:

- ✓ Anticipated turbulence.
- ✓ Flow velocity/sheer stress.
- ✓ Restricted space.
- ✓ Ice scour.
- ✓ Protecting existing infrastructure.



Mad River, Thornton

Caution: Hard armor not always successful or permanent without considering stream morphology.



Let's Review

Purpose of New Bank/Shoreline Stabilization Rules.

- ✓ *Maintain or restore healthy and vegetated banks and shorelines.*

New Hierarchy of Bank Stabilization Practices.

- ✓ *5 methods listed in order of preference.*

New Definitions.

- ✓ *Bioengineered bank stabilization, soft bank stabilization, etc.*

New Project Classifications.

- ✓ *Minimum, Minor, Major that includes more project types.*



Let's Review

Project Specific Examples.

- ✓ *Completed bioengineered projects.*

New Monitoring Requirements.

- ✓ *Allow for adaptive management.*
- ✓ *Ensure long-term success.*

Required Reference Documents.

- ✓ *Consistent design techniques.*

How to demonstrate that hard-scape design is warranted.

- ✓ *Engineering considerations.*



Questions?

