

A GUIDE TO STREAM RESTORATION

Restoration of stream resources occurs for many reasons. You might be interested in goals of:

- Reducing and preventing further bank erosion,
- Increasing your property value,
- Improved fishing,
- Maintaining and improving water quality and quantity.

Lots of resources are available as you evaluate your streams health and your options for restoration. This guide is a designed to get you started.



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CALANDER OF STREAM RESTORATION

Timing your restoration efforts can influence the success of your project.

Technique	Primary Timing
Riparian Fencing	Year round
Willow/Shrub Planting	Spring prior to bud break
Bank Revetment	Fall/Winter during low flows; Spring prior to high flows
Bank Bioengineering	Fall/Winter during low flows; Spring prior to high flows



STREAM RESTORATION: RIPARIAN FENCING

Creating a streamside vegetation (riparian) pasture can go a long ways:

Pros:

Leaves existing riparian vegetation in place.
Provides additional pasture management options.
Simple.

Cons:

Possibly long term before achieving stream restoration goals.
Water needs to be provided for livestock either in offsite water or in water gaps

Considerations:

Riparian pastures can become weedy. Grazing should be timed to reduce and suppress weeds.
Heavily deteriorated riparian systems might need additional input (see following pages).



STREAM RESTORATION: RIPARIAN FENCING

Strategies:

Reduce wildlife damage to fences by follow the FWP's recommendations in "How to Build Fence with Wildlife in Mind"¹⁸:

Consider a temporary fence, laydown fence, or leaving fences open when pastures are not being used.

Fence a large enough area to serve as an short term riparian pasture.

Improve the success of your fence layout by fencing livestock out of steep or tight draws that dead end at your riparian fence.



¹⁸<http://fwp.mt.gov/fwpDoc.html?id=57573>

STREAM RESTORATION: WILLOW/SHRUB PLANTING

Augmenting existing streamside vegetation (riparian) can speed the restoration process and potentially reduce erosion:

Pros:

Leaves existing riparian vegetation in place.

Establishes willows and shrubs at key locations.

Uses free or cheap planting material that is local to your riparian systems.

Cons:

Possibly long term before achieving stream restoration goals.

Grazing should be excluded while willows/shrubs are established.

Considerations:

Streamside vegetation can reduce erosion but may be difficult to establish at areas prone to erosion.

Heavily deteriorated riparian systems might need additional input (see following pages).



STREAM RESTORATION: WILLOW/SHRUB PLANTING

Strategies:

Planting material can be locally collected.

Willows can grow new roots along stem material. Therefore, willows can be planted from cuttings. Soak cuttings for up to a week to improve planting success. Cuttings (1/2—1 inch in diameter) should be collected in the spring before the buds have opened. Cuttings should be inserted into the bank so that they are still wet when the stream level is at low flow. Excess material should be cutoff so that the cutting extends out of the ground no more than 6 inches.

Mature and potted willows/shrubs can be transplanted in the fall and spring when the plants are still dormant. Plant transplants so they are at the same depth from where they were dug. Planting success maybe improved if above ground branches are trimmed bank to within 6—12 inches of the ground.

Planting material can also be purchased through the DNRC State Nursery—(406) 542-4244

Species Group	Cuttings	Transplant
Alder		X
Aspen		X
Boxelder		X
Cottonwood	X	X
Dogwood	Mod	X
Willow	X	X

STREAM RESTORATION: BANK REVETMENT

Revetment is the organic version of riprap and includes bundles of brush, roots, trees, and fiber rolls.

Pros:

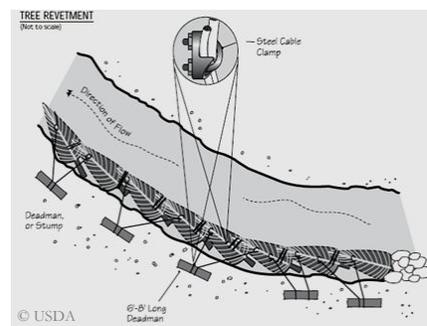
**Armors streambanks using material that is break-down overtime and become “part” of the stream.
Can be easily installed at key locations.
Uses free or cheap material that is local to your riparian systems.**

Cons:

**Possibly long term before achieving stream restoration goals.
Works poorly on high-energy streams.
Often requires heavy equipment to move material.**

Considerations:

**Works best when used in combination of willow/shrub planting (see previous page) and other revegetation efforts.
Heavily deteriorated riparian systems might need additional input (see following pages).**



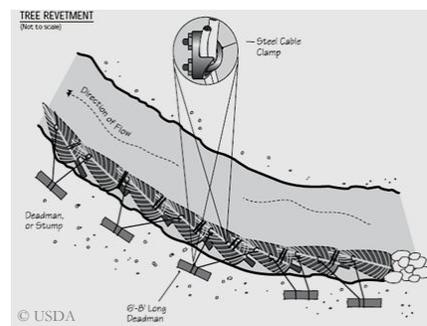
STREAM RESTORATION: BANK REVETMENT

Strategies:

It is important that revetment material is tight to the bank surface and does not allow water to pool between it and the bank. Extend the material below low flow levels and above high flow levels.

Revetment material should be anchored securely to the bank to reduce outwash during high flow.

Avoid extending revetment material into the channel which might cause downstream erosion.



STREAM RESTORATION: STREAMBANK BIOENGINEERING

Bank engineering includes recontouring banks to increase streambank slope, realignment with historic channels, and reconnecting the stream to historic floodplains.

Pros:

**Quickly recovery to stream restoration goals.
Increased stream function.
Effective on high-energy streams.**

Cons:

**Requires expert design and installation.
High cost.**

Considerations:

Works best when used in combination with all the previous restoration techniques (see previous pages) and other revegetation efforts.



STREAM RESTORATION: STREAMBANK BIOENGINEERING

Strategies:

Streams are naturally dynamic and move across the landscape. Avoid using materials that are not native and designs that “lock” your stream into a configuration.

Understanding your stream in both high and low flows is very important to the ultimate success of streambank bioengineering.

Know the stream above and below your reach.

Bioengineered streambanks should allow streams to dissipate the energy of flooding either across the existing floodplain or a designed, inset floodplain.

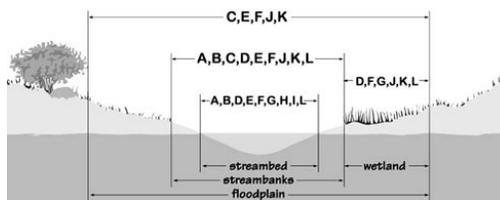
The design of bioengineered streambanks may require working with an expert.



PERMITS NEEDED FOR STREAM RESTORATION

Guide to Required Permits:

- A. Montana Stream Protections Act—FWP—(406) 444-2449
- B. Storm Water Discharge General Permits—DEQ- (406) 444-2406
- C. Streamside Management Zone Law—DNRC-(406) 542-4300
- D. Montana Floodplain and Floodway Management Act—DNRC-(406) 542-4300
- E. Short-term Exemption from Montana's Surface Water Quality Standards—DEQ- (406) 444-2406
- F. Montana Natural Streambed and Land Preservation Act—DNRC-(406) 444-6667
- G. Montana Land-use License or Easement on Navigable Waters—DNRC-(406) 444-2074
- H. Montana Water Use Act—DNRC-(406) 444-6610
- I. Federal Clear Water Act-U.S. Army Corp-(406) 444-6670
- J. Federal Rivers and Harbors Act-U.S. Army Corp-(406) 444-6670
- K. City of County Floodplain Development Permit
- L. Other laws that May Apply



This information courtesy of Montana Department of Natural Resources

NEED FURTHER HELP AND INSPIRATION?

Help and Guidance:

Montana State University Extension—Gallatin County—(406) 388-3213

Montana Association of Conservation Districts—(406) 443-5711

Montana Department of Natural Resources—(406) 444-6601

Montana Watershed Coordinating Council—(406) 475-1420

Grants and Loans for Restoration:

Opportunities to offset the cost of restoration—http://dnrc.mt.gov/cardd/loans_grants/

Other Resources:

Opportunities to offset the cost of restoration—http://dnrc.mt.gov/cardd/loans_grants/

Sources:

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FWP, NRCS,