

Stream Restoration

Definition/Purpose

A Stream Restoration system means the use of bioengineering practices, native material revetments, channel stability structures, and/or the restoration or management of riparian corridors in order to protect upland BMPs, restore the natural function of the stream corridor and improve water quality by reducing sedimentation to streams from streambank. (DIP)

Policies

1. The use of this BMP for ACSP funding is intended for sites where the natural streambank has been severely damaged by human or animal access, other activities, or natural processes. Each site should be reviewed by the District Board to determine the eligibility for cost share funding and prioritize the sites as to the direct effects, long term benefits and the landowner's willingness to be involved, maintain, and support the practice.
2. Planned practices require a contact with the U.S. Army Corps of Engineers and the N.C. Wildlife Resources Commission for all proposed sites to determine if a Section 404 permit is needed. A Section 401 Water Quality certification may also be needed from the N. C. Division of Water Quality.
3. A minimum set-back of 20 feet of undisturbed native vegetation or restored riparian area adjacent to the installed practice is mandatory in all situations.
4. An analysis of the existing stream condition and the degree of departure for the existing stream condition from its full operating potential must be made as a part of the planning and design process for this BMP. The analysis of stream condition and departure may be made following the procedures established by Dave Rosgen in Applied River Morphology, Chapter 6 (Rosgen, 1996). Rosgen's field survey form, Summary of "Condition" Categories for Level III Inventory may be used to document the analysis.
5. If the analysis, when completed as outlined in Item No. 4, shows that the profile, pattern, and/or dimensions of the stream need to be restored in order to restore the natural stability and function of the stream, assistance will be required from a person who has successfully completed Rosgen's Restoration Course or equivalent natural channel design training.
6. Installations of this BMP will be monitored upstream and downstream as necessary to determine the effects and compare the condition of the stream before versus after the installation. Monitoring can include physical measurements, biological/water quality indicator measurements, chemical measurements (WQ sampling), and/or documentation of visual observations. If documented visual observation is the only monitoring technique used, the observations will be mandatory for the first five years after installation. Other monitoring will be conducted for a minimum of three years.
7. This practice may further be supported by other BMPs such as filter strips, critical area planting, riparian forest buffer, use exclusion, and stream crossings. In-stream

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techniques such as weirs, deflectors, and other proven practices may also be used to address the stabilization of the streambanks.

8. Additional measures to minimize or manage access or traffic may be necessary to ensure the long-term stability of the restored stream/streambank.
9. Estimates of streambank erosion in tons/yr. may be substituted for soil loss calculations on the contract.
10. Effects.
 - Streambank erosion (required)
 - Runoff and flooding (required)
 - Turbidity (required)
 - Surface water temperature (optional)
 - Stream fish population (optional)
 - Stream benthic invertebrates (optional)
11. Repairs on established sites will require a new analysis to determine the suitability of repairing the BMP before the District can commit funds to a repair CPO.
12. BMP soil impacts are required on the contract. Include the treated streambank area and buffer as well. Refer to the Minimum NCACSP Effects Requirements table later in this section for the correct methods of calculation.
13. Permit fees are eligible for cost share up to 75% of fee.

Standards

N. C. NRCS Technical Guide, Section IV, Standards #580 (Streambank and Shoreline Protection), #322 (Channel Bank Vegetation), #584 (Channel Stabilization), #612 (Tree/Shrub Establishment), #382 (Fence), #342 (Critical Area Planting), #472 (Use Exclusion), #393 (Filter Strip), #391 (Riparian Forest Buffer), #578 (Stream Crossing), NRCS Engineering Field Handbook Chapter 16 (available in Draft from Area Offices).

LEVEL III: ASSESSMENT OF STREAM CONDITION AND DEPARTURE

SUMMARY OF "CONDITION" CATEGORIES FOR LEVEL III INVENTORY

Stream Name _____	Observers _____
Location _____	Stream Type _____ Date _____
Riparian Vegetation _____	Flow regime _____
Stream Size, Stream order _____	Depositional pattern _____
Meander pattern _____	Debris/channel blockages _____
Channel stability rating (Pfankuch) _____	Altered Channel State: _____
Sediment supply (check appropriate category):	Dimension/shape:
Extreme _____	Width _____
Very High _____	Depth _____
High _____	Width/depth ratio _____
Moderate _____	Patterns: (*show as funct. of Wbkf):
Low _____	Meander length* _____
Streambed (vertical) stability	Radius of curve* _____
Aggrading _____	Belt width* _____
Degrading _____	Sinuosity _____
Stable _____	Profile:
Width/depth ratio condition:	Water surface slope _____
Normal (stable) _____	Valley slope _____
High _____	Bed features:
Very high _____	Riffle/pool _____
Streambank erosion Potential:	Step/pool _____
Bank erodibility:	Conver./divrg. _____
Extreme _____	Plane bed _____
High _____	Other _____
Moderate _____	Spacing* _____
Low _____	Describe alterations: _____
Near-bank stress:	
Extreme _____	
High _____	
Moderate _____	
Low _____	
General Remarks	

Attach photographs taken mid-stream looking up and downstream. Make site map.

Attach vicinity map of reach and/or aerial photo for specific location.

Note any permanent cross-section for level IV verification of cross-section stability, actual erosion rates, change in pebble counts, deposition studies, sediment sampling, etc.

Attach copy of: stream classification field form, channel Stability rating form, bank erosion rating form, profiles, cross-sections, pebble counts, etc.

Signature: _____