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 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. Permit fees are eligible for cost share up to 75% of fee.

STREAM RESTORATION	
Maintenance Period	10 YEARS
BMP Units	LIN FT
Required Effects	ACRES_AFFECTED (treated area and buffer) SOIL_SAVED
JAA/NRCS Standard unless otherwise noted	ENG – 580 – Streambank and Shoreline Protection ENG – 322 – Channel Bank Vegetation ENG – 584 – Channel Stabilization
Supporting Practices/References	ECS – 612 – Tree/Shrub Establishment ECS – 382 – Fence ECS – 342 – Critical Area Planting ECS – 472 – Use Exclusion ECS – 393 – Filter Strip ECS – 391 – Riparian Forest Buffer ENG – 578 – Stream Crossing NRCS Engineering Field Handbook Chapter 16
CS2 Reference Materials	NC-ACSP-11 Signature Page Map with BMP location, fields, and roads.

LEVEL III: ASSESSMENT OF STREAM CONDITION AND DEPARTURE

SUMMARY OF "CONDITION" CATEGORIES FOR LEVEL III INVENTORY

Stream Name _____
Location _____
Riparian Vegetation _____
Stream Size, Stream order _____
Meander pattern _____
Channel stability rating (Pfankuch) _____
Sediment supply (check appropriate category):
Extreme _____
Very High _____
High _____
Moderate _____
Low _____
Streambed (vertical) stability
Aggrading _____
Degrading _____
Stable _____
Width/depth ratio condition:
Normal (stable) _____
High _____
Very high _____
Streambank erosion Potential:

Bank erodibility:	Near-bank stress:
Extreme _____	Extreme _____
High _____	High _____
Moderate _____	Moderate _____
Low _____	Low _____

Observers _____
Stream Type _____ Date _____
Flow regime _____
Depositional pattern _____
Debris/channel blockages _____
Altered Channel State: _____
Dimension/shape:
Width _____
Depth _____
Width/depth ratio _____
Patterns: (*show as funct. of Wbkf):
Meander length* _____
Radius of curve* _____
Belt width* _____
Sinuosity _____
Profile:
Water surface slope _____
Valley slope _____
Bed features:
Riffle/pool _____
Step/pool _____
Conver./divrg. _____
Plane bed _____
Other _____
Spacing* _____
Describe alterations: _____

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: _____