Road Stream Crossing Inventory
Scoring for Erosion Quantification

SITE NUMBER_____ **LOCATION** upstream _____ downstream _____

culvert/bridge crossing _____ stream bank _____

left bank _____ right bank _____

Soil Texture (check one)

____ sand ____ gravel ____ silt _____clay _____ organic matter

if the bank is stratified or multiple soil textures are observed, indicate the approximate percentage of each soil texture.

Vertical Height of Erosion Site *(H)*

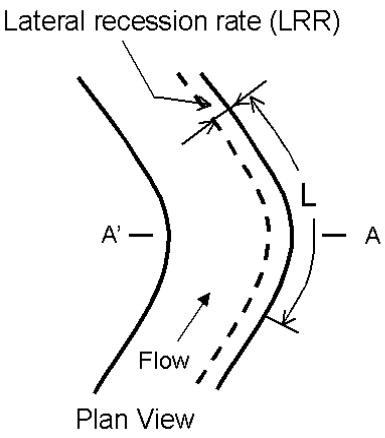
_____ feet

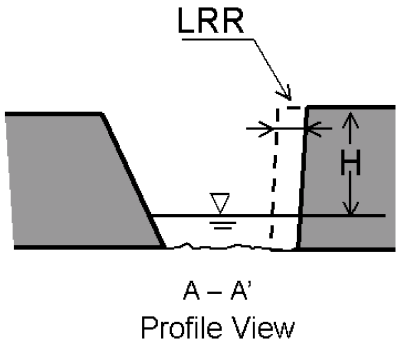
Length of Erosion Site *(L)*

_____ feet

Erosion Severity

____ very severe ____ severe ____ moderate ____ slight





Erosion Scoring Form Instructions

Soil texture
If the bank is stratified, please estimate the percentage of each soil type observed. Estimate soil type visually. However, if you can determine a more specific soil type by touching the soils, record this observation. You can use this more specific classification to determine a dry density (for calculation of annual loading. See below.)

Height of erosion site
Determine the height of the eroding bank from the water line to the top of the bank.

Length of erosion site
Determine the length of the eroding bank.

Erosion Severity
Estimate the severity of erosion using the following descriptions. This estimation can be used to approximate the lateral recession rate *(LRR)*.

Category	**Description**	**Lateral Recession Rate (feet/year) *(LRR)***
Slight	Some bare bank, but active erosion not readily apparent. Some rills but not vegetative overhang. No exposed tree roots.	0.01-0.05
Moderate	Bank is predominantly bare with some rills and some vegetative overhang.	0.06-0.2
Severe	Bank is bare with rills and severe vegetative overhang. Many exposed tree roots and some fallen trees and slumps or slips. Some changes in cultural features such as fence corners missing and realignment of roads or trails. Channel cross-section becomes more U-shaped as opposed to V-shaped.	0.3-0.5
Very Severe	Bank is bare with gullies and severe vegetative overhang. Many fallen trees, drains and culverts eroding out and changes in cultural features as above. Massive slips or washouts common. Channel cross-section is U-shaped and stream course or gully may be meandering.	0.5+

Calculating Sediment Loading

Sediment loading from each site can be estimated based upon the geometry of the site and an estimation of the lateral recession rate. The lateral recession rate is the thickness of soil eroded from a bank surface perpendicular to its face in an average year. It can be estimated by using the above table, by reviewing aerial photographs (in which a change in the bank location can be measured over time) or by observing the bank's position relative to a stationary object (such as a utility pole or culvert) over time. Use the following equations to calculate the volume and weight of sediment loss in an average year.

Volume of annual soil loss (cubic feet/year) = length of eroding bank (feet) *(L)* * height of eroding bank (feet) *(H)* * lateral recession rate (feet/year) *(LRR)*.

Weight of annual soil loss (tons/year) = volume of annual soil loss (cubic feet/year) * dry density (tons/cubic foot).

Use your estimation of soil type to determine dry density. If the soils are stratified or mixed, determine the average density by multiplying the percentages of each soil texture by their respective densities and adding. For example, for an eroding bank composed of 40% clay and 60% silt, use the following equation:

0.4 * 0.035 + 0.6 * 0.0425 = 0.0395

Use the following dry density soil weights to determine the weight of annual soil loss. If you were able to determine a more specific soil textual class, use that determination to estimate a dry density from a source on soil physical properties. For example, sandy clay loam has a density of 0.045 tons/cubic foot.

Soil textural class	**Dry density (tons/cubic foot)**
organic matter	0.011
gravel*	0.05
sand	0.055
silt	0.0425
clay	0.035

Sources

MDEQ Surface Water Quality Division. Pollutants Controlled Calculation and Documentation for Section 319 Watersheds Training Manual. Revised June 1999.

*gravel dry density source: Dewberry & Davis. Land Development Handbook. McGraw Hill. New York. 1996.