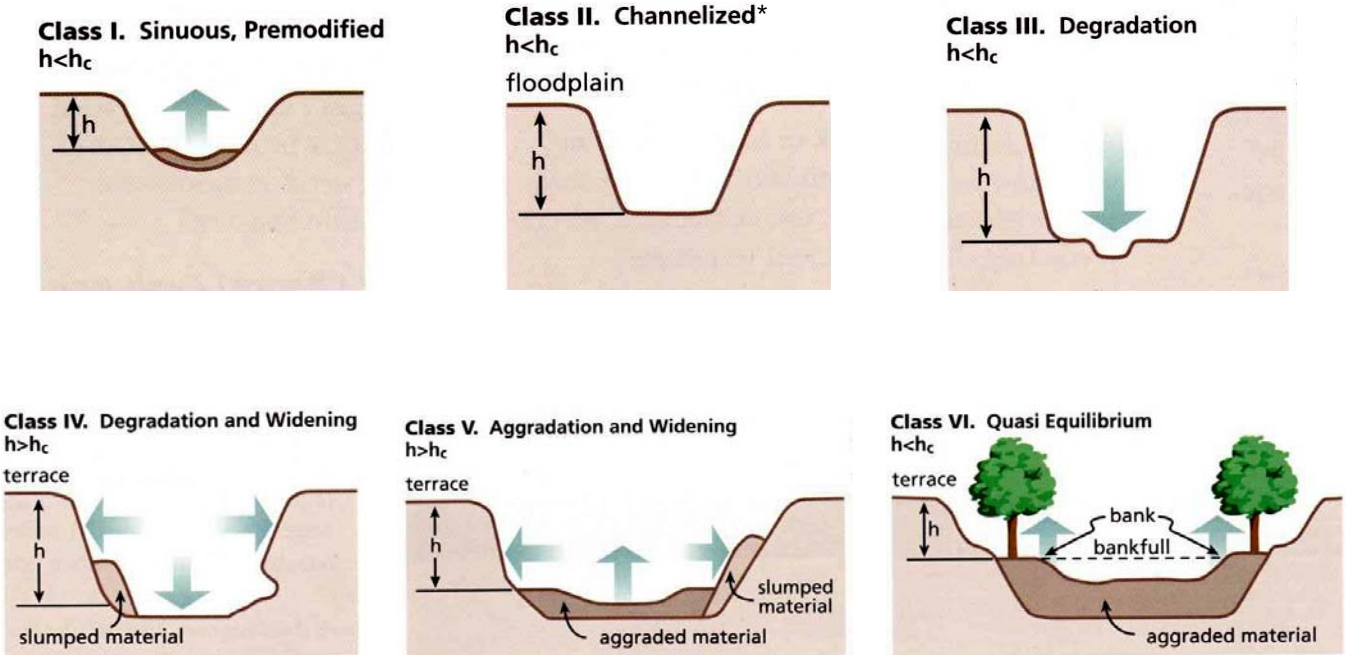
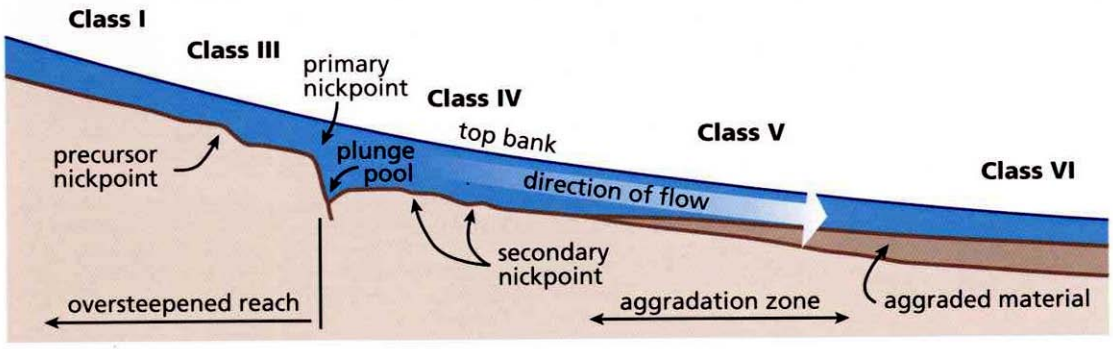
CHANNEL EVOLUTION MODEL (SIX STAGES)
Simon and Hupp, 1986



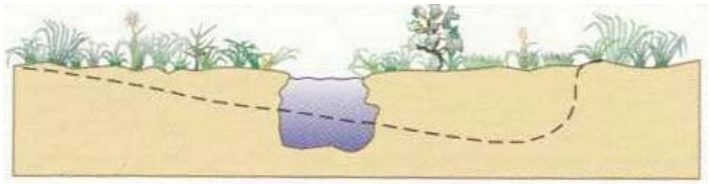
**Anthropogenic*



The channel evolution model (CEM) above illustrates the importance of establishing or assuring a stable grade before initiating any bank protection project. A channel that is actively degrading (Stage III above) may potentially undermine any project that is placed on the banks. Note that a stage II is not necessarily found in all channels and that it does not necessarily initiate a stage III. Also, keep in mind that it is possible to skip steps and that physical constraints may limit the ability of the channel to evolve in any one direction.

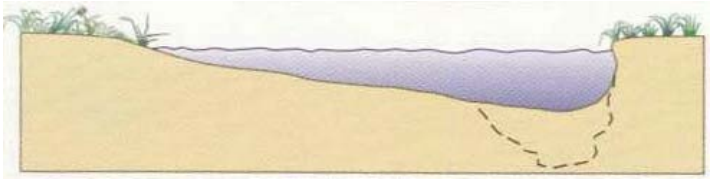
Sequence of Stream Type Occurrence Based on Morphological Change
Rosgen, 1996

E4 → C4



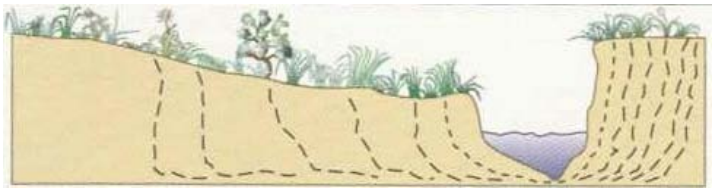
Morphological Variables

C4 →G4c



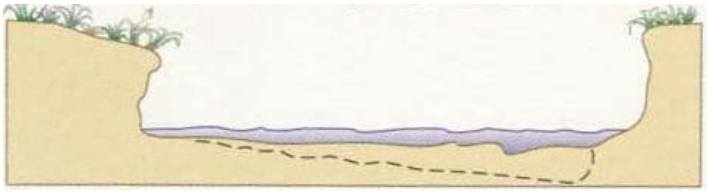
Stream Type C4
Entrenchment Ratio: 20
Width/depth ratio: 18
Sinuosity: 1.8
Slope: .005
Meander width ratio: 8
Valley slope: .009

G4c →F4



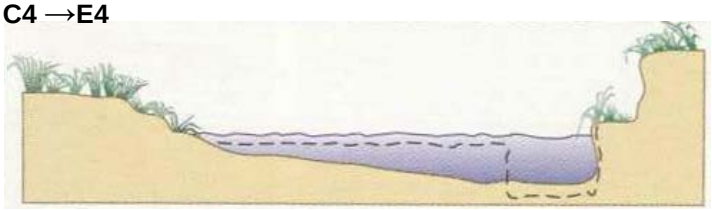
Stream Type G4
Entrenchment Ratio: 1.1
Width/depth ratio: 5
Sinuosity: 1.3
Slope: .007
Meander width ratio: 4

F4 →C4



Stream Type: F4
Entrenchment Ratio: 1.0
Width/depth ratio: 150
Sinuosity: 1.2
Slope: .008
Meander width ratio: 1.5

C4 →E4



Stream Type: C4
Entrenchment Ratio: 12
Width/depth ratio: 20
Sinuosity: 1.6
Slope: .006
Meander width ratio: 6

E4