



Office  
of Water

# Murrumbidgee – Erosion Control Workshop

Engineering Solutions

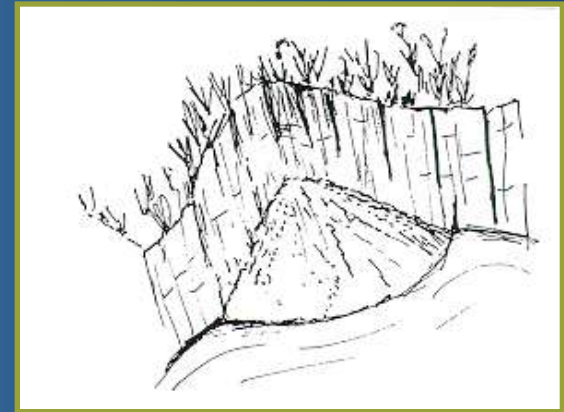
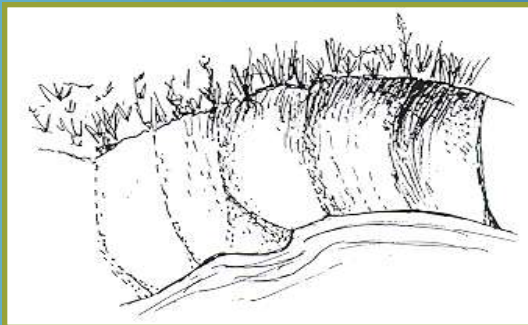
Tim Smith – NSW Office of Water  
Queanbeyan

# Principles of River Management

- Erosion of rivers and creeks is a natural and essential process
  - The layering evident in the banks of creeks shows a complex history of deposition and erosion
  - Dark layers represent periods of stability
  - Light layers represent periods of flow domination
- Catchments have changed
  - More flow within channel
  - Erosion and deposition more “vigorous”
- Return to “natural state” is unrealistic
  - Manage what is in front of us
- Cannot control creek
  - Works will sometimes be inadequate
  - This should not be seen as a “failure”

# Principles of River Management

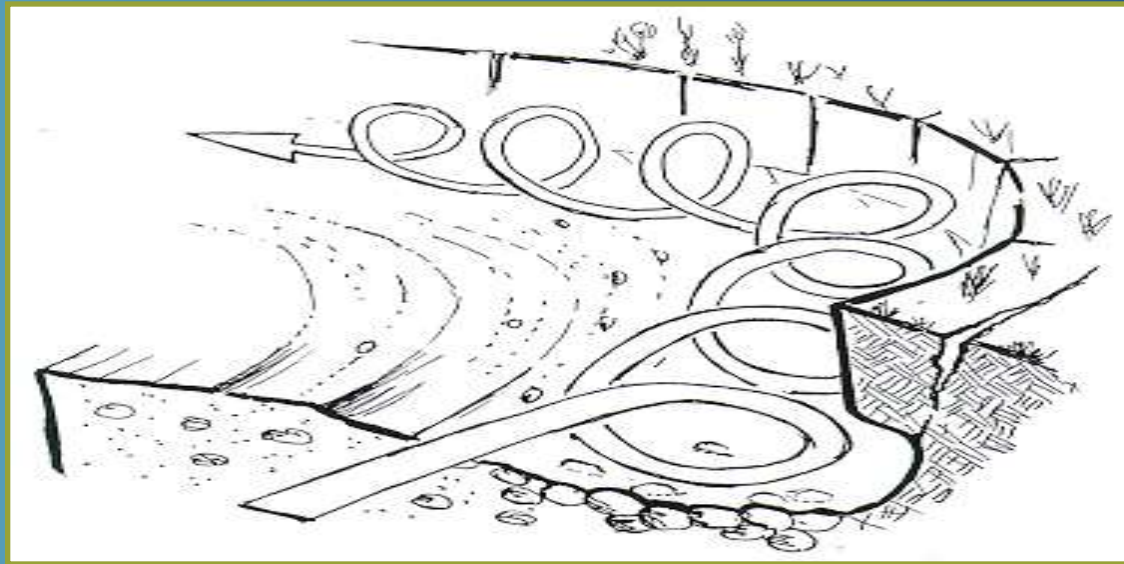
- Three broad categories of bank erosion
  - Sub-aerial erosion
  - Scour
  - Mass Failure



# Principles of River Management

## ■ Scour

- Most evident of these erosion types in this area
- Flows form a secondary “corkscrewing” current that erodes bank



# Engineering Solutions

- Structural works must never be regarded as permanent solutions to erosion
- Materials will deteriorate over time, or be outflanked by the natural meander migration of a river
- Structural works allow for a period of vegetation establishment to occur
- Vegetation is the best long-term protection against bank erosion

# Engineering Solutions

- Rock armouring



# Engineering Solutions

- Rock armouring



# Engineering Solutions

- Rock armouring





# Engineering Solutions

- Rock groynes



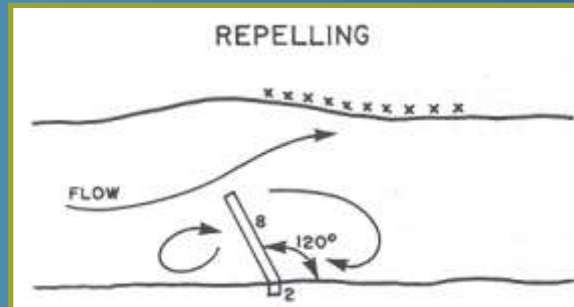
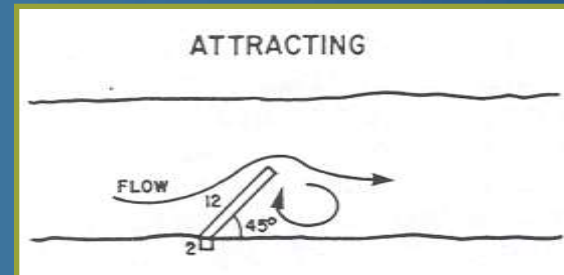
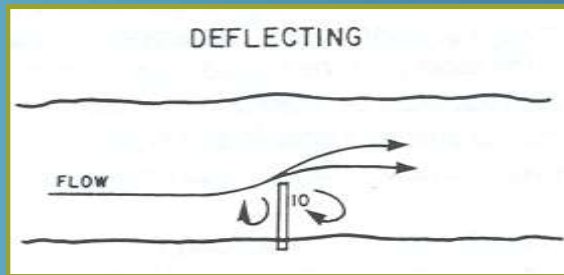
# Engineering Solutions

- Rock groynes (aerial view)



# Engineering Solutions

- Rock groynes (alignment)



# Engineering Solutions

- Sausage gabions



# Engineering Solutions

- Sausage gabions



# Engineering Solutions

- Sausage gabions (groynes)



# Engineering Solutions

- Log wall



# Engineering Solutions

- Log groynes





# Engineering Solutions

- Log pins



# Engineering Solutions

- Log pins



# Engineering Solutions

## ■ Concrete

- Too rigid, no flexibility required for in-channel works
- Cracks, these become weak points
- Not necessarily cheaper than other options such as rock armouring

# Engineering Solutions

- Gabion baskets and mattresses
  - Too rigid, no flexibility required for in-channel works
  - Can only withstand low to moderate flows
  - Mattresses have high surface area to weight ratio, so can float in high flow



# Engineering Solutions

- Sausage gabions



# Engineering Solutions

## ■ Gabion baskets and mattresses

- Too rigid, no flexibility required for in-channel works
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# Legal Responsibilities

- Works within channel and within 40 metres of high bank require approval from NSW Office of Water
- In-channel works may also require co-consent from NSW Fisheries
- Approval is required for works that involve excavation of bed and/or bank or deposition of material on bed and/or bank
- Can access approval form from

[www.water.nsw.gov.au/Water-Licensing/Approvals/Controlled-activities/default.aspx](http://www.water.nsw.gov.au/Water-Licensing/Approvals/Controlled-activities/default.aspx)

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