Introduction to Stream Deflectors
Stream Deflector Protection

• Usually Used in Transport Zone
• Diverts Stream Energy Away from the Stream Bank
What is a stream deflector?
Answer: A stream deflector is a structure that extends into the stream from the bank to redirect streamflow away from an eroding bank.

Stream Deflectors:
• Are low structures that are oriented upstream, into the flow.
• Slow water velocities
• Induce sediment deposition
They can be big
Hard Points and/or Kickers

They can be smaller

Stone Spurs
Stream Deflectors Design Criteria

• Understand basic principles of how stream deflectors work
• Stone Size
• Alignment
• Design
  – Profile
  – Key into bed
  – Key into bank

There are a lot of different types.
Design often requires an engineer
This introduction is going to cover the basics
You may want to get more detailed training
How Do Stream Deflectors Work
These structures slow stream velocity near bank

Question: Why is this useful when you want to stop bank erosion?

Answer: Slower velocity = less erosion

Typically the protection is 3-4 times the length of the deflector

Sediment that is naturally in the stream will drop out of the flow when the water slows
**Stone size**

- The force of the river or stream hits the deflector directly
- Therefore the stone must be larger than riprap on bank
- Suggest that the minimum size is twice the calculated riprap size
Alignment

- Can Vary
- Use 45 degrees from bank
- Clap a 90 degree angle than half

Approximately 45° Pointed up stream

Angle varies depending on radius of bend
Do not use on too tight of a bend
Deflectors are often used in groups. The angle may vary.

- Captured flow
- Redirected flow
- Flow is controlled within the set of deflectors

keeps the same basic curve
Design: Profile

Length < 1/3 channel width
Maximum Bank Height = smaller of 1 meter or 1/3 total bank height
End Height = ½ Bank Height
Design: Bed Key

Bed key = 1 to 2x height
Design: Bank Key

Bank key is larger of 1 meter or bank height
You need an engineer to help with the design if:

• The river has high velocities
• The river is large
• The erosion is significant
• The river system is unstable
• There is something very important on the bank
• The project will cost a lot of money
• Laws state you must have an engineer