How to Repair a Small Stream Headcut

What is a Headcut?

Headcuts are a type of streambank erosion. They form at the upper end of a stream where a "knickpoint" is present. The knickpoint is a sudden drop in elevation of the stream. Depending on severity, the knickpoint may look like a small waterfall or cliff and a plunge pool might be present at its base. The knickpoint will continue to advance upstream if left unchecked.

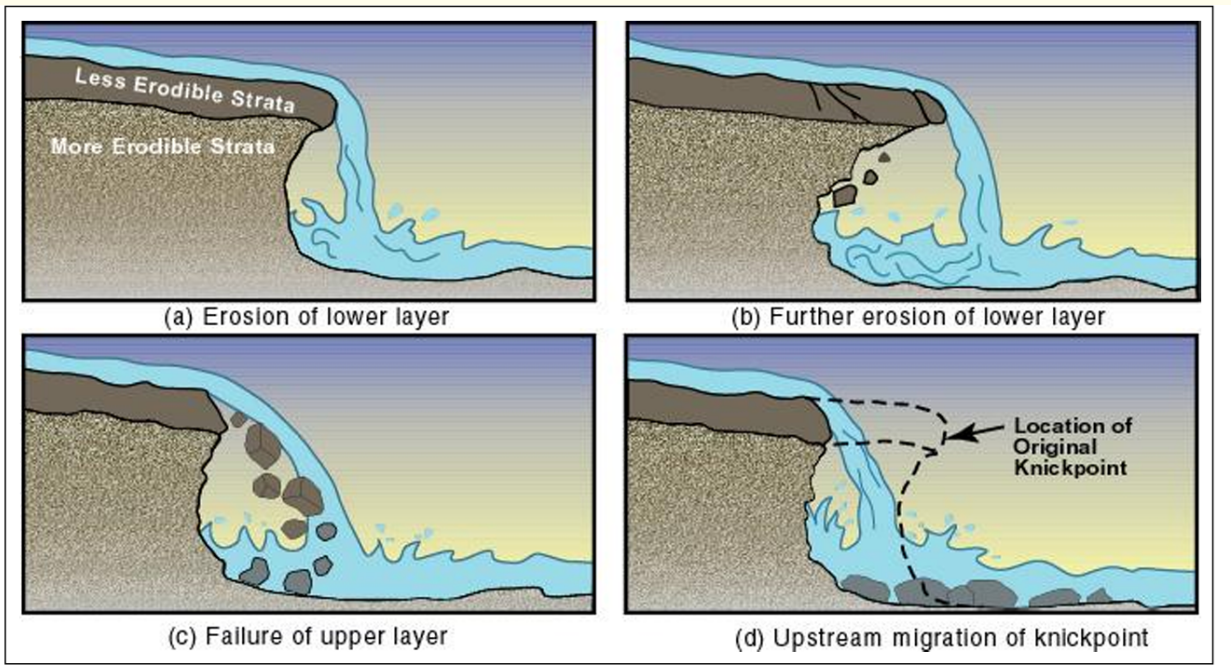

Figure 1. Diagram of knickpoint migration upstream on a headcut and streambank erosion (Papanicolaou et al., 2018).

Why are Headcuts Harmful?

As headcuts form and advance upstream, the streambed deepens, banks become incised, and sedimentation increases as land and soil are lost to erosion. Ultimately, the stream becomes disconnected from the floodplain which can affect the entire watershed.

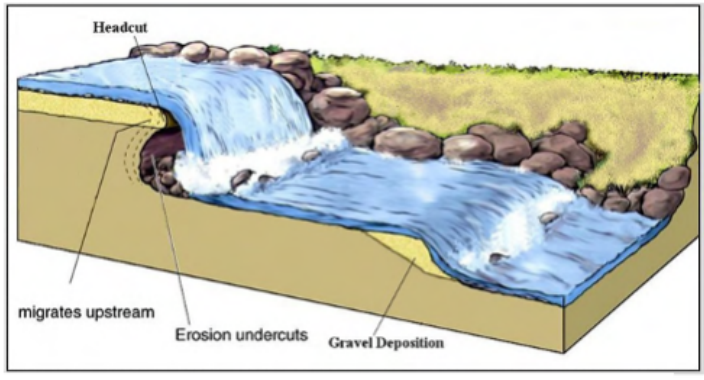

Figure 2. Headcut illustration showing upstream migration, erosion, and sedimentation (DCSWCD, 2012).

What Can You Do to Fix a Headcut?
If you suspect you have a headcut forming on your land, first assess how large the issue is. For small streams (less than 5 feet across), good news! You can take the steps outlined below to repair it. If your headcut is large (more than 5 feet across), consider reaching out to your local NRCS office to explore other restoration options.

Materials and Supplies Needed for Headcut Repair:

- Work gloves
- Safety glasses
- Work boots
- Shovel
- Landscape fabric
- Pre-cut logs or rocks
- Wooden stakes
- Mallet

Steps to Repair a Small Stream Headcut:

1. Determine the appropriate time of year to conduct your stream repair. We recommend restoration take place from October - March, when most wetland species are dormant.

2. Locate the knickpoint of your headcut. This should be upstream where the water suddenly drops in elevation.

3. Using a shovel, remove the overhanging soil at the knickpoint so there is now a gentle slope downwards instead of a sharp drop.


Photo by Rivers of Carbon

4. If you are using pre-cut logs, dig a trench perpendicular to the stream at the base of the knickpoint, with at least 2 extra feet on each side of the stream. The trench should be as deep as the base of the slope. See instructions here if you are using rocks instead of logs.



5. Lay the landscaping fabric across the stream so it covers the slope and trenches. Make sure there is excess on the edges.



6. Place the log over the landscape fabric and into the trench. The log should be as flush as possible with the base of the slope.

7. If the log needs extra support to stay in place, hammer wooden stakes behind it for support.



8. Fill in any remaining gaps under the log and on the streambank with excess soil that was removed when digging the trench. Compact it so there are no holes or leaks.

9. Transplant some rushes or sedges from other areas in the wetland to the bare spots along the stream bank and logs. This will aid in stabilizing the bank.



10. Watch as plants start to re-colonize the stream bank and be proud of your hard work! Check out some headcut repair after photos below.



References and Other Resources:

Delaware County Soil and Water Conservation District, Delaware County Planning Department. (2012). *Post-Flood Emergency Stream Intervention Training Manual*.

Papanicolaou, A. N., Wilson, C. G., Dermisis, D. C., Thomas, J., & Elhakeem, M. (2008). *The effects of headcut and knickpoint propagation on bridges in Iowa* (No. IHRB Project TR-541).

Treating a small erosion headcut with rock flume

Resource Sheet 1: Streambank Erosion and Restoration - January 2010