

Local mitigation techniques

New Trends for Sustainable Communities

by

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Delaware County Soil & Water Conservation District





Historical Stream Practices





Channel Straightening



8-31-2011

Channel Straightening

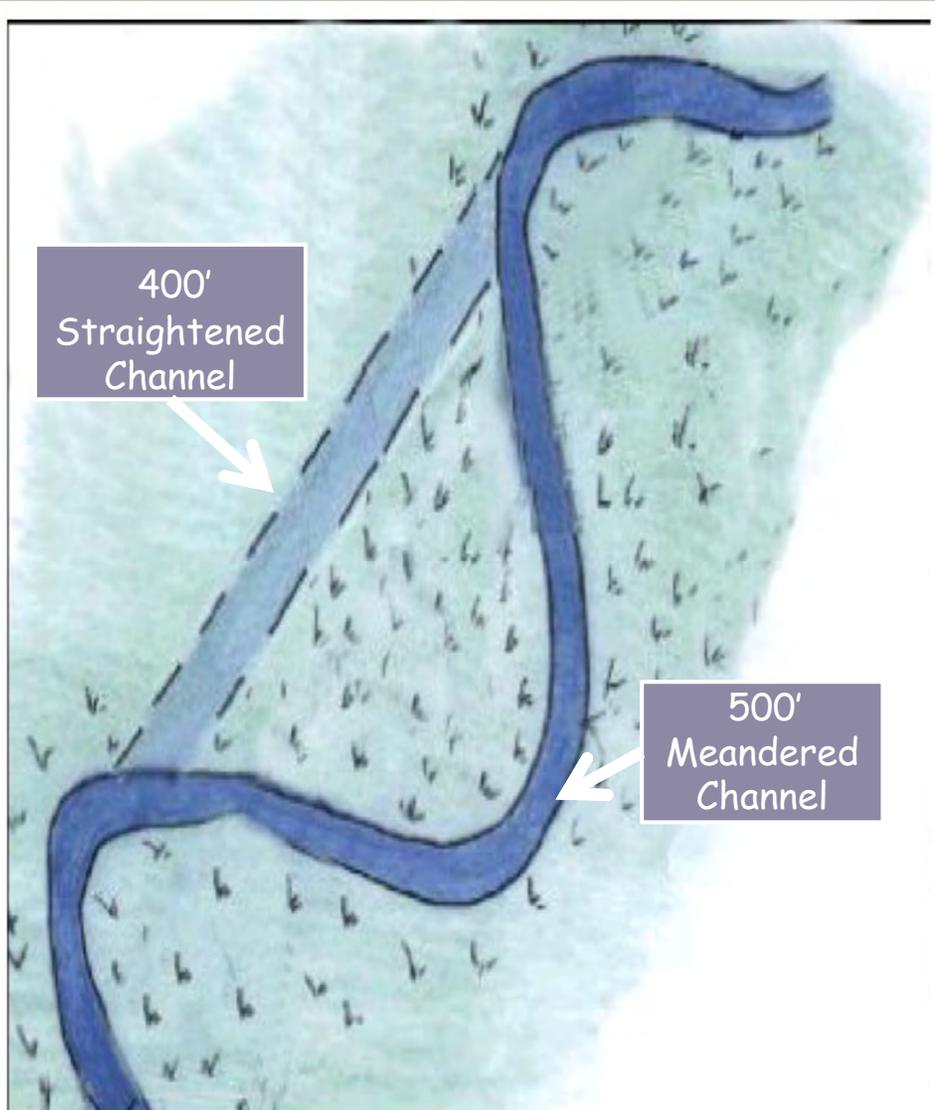


Channel Straightening - Repair

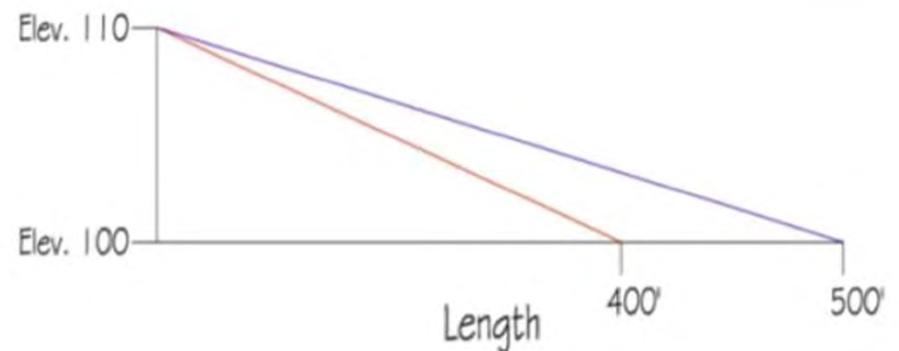


9-23-2011

Channel Straightening



- Shorter distance means a steeper slope
- A steeper slope increases velocity
- A steeper slope increases erosion on the streambank and bed



Historic Stream Stabilization Practices



8-12-05



7-31-06





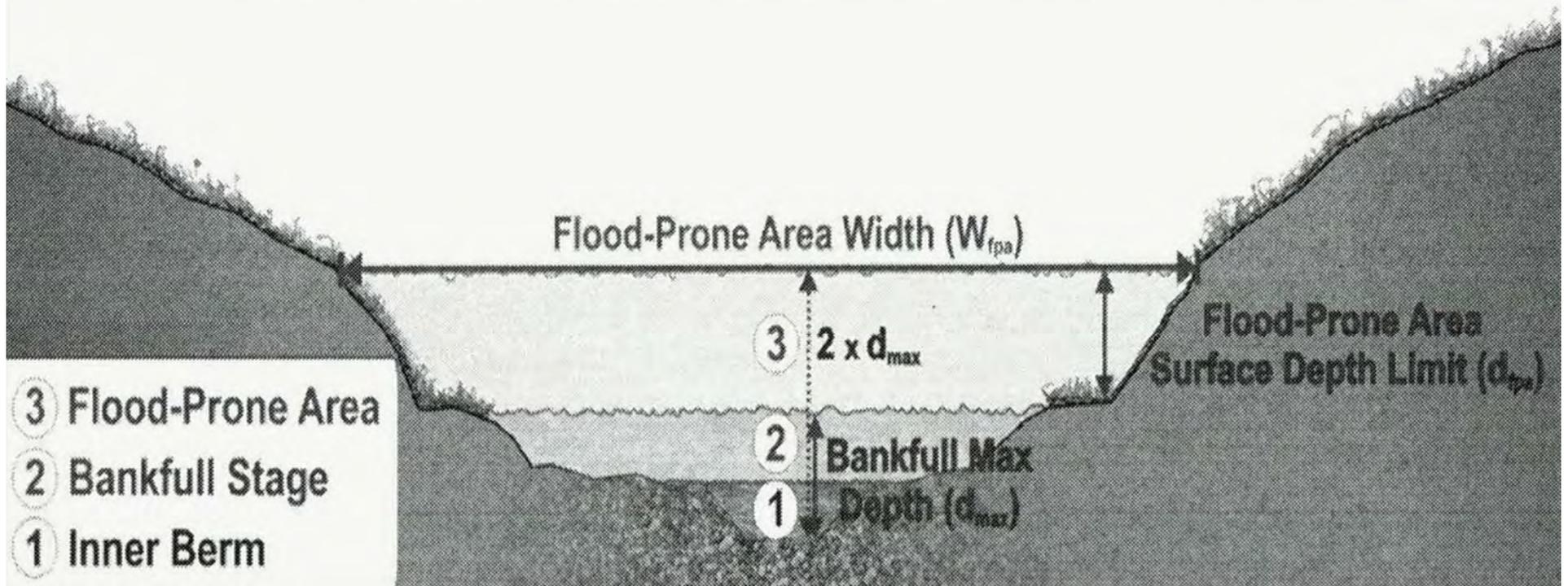
7-31-06



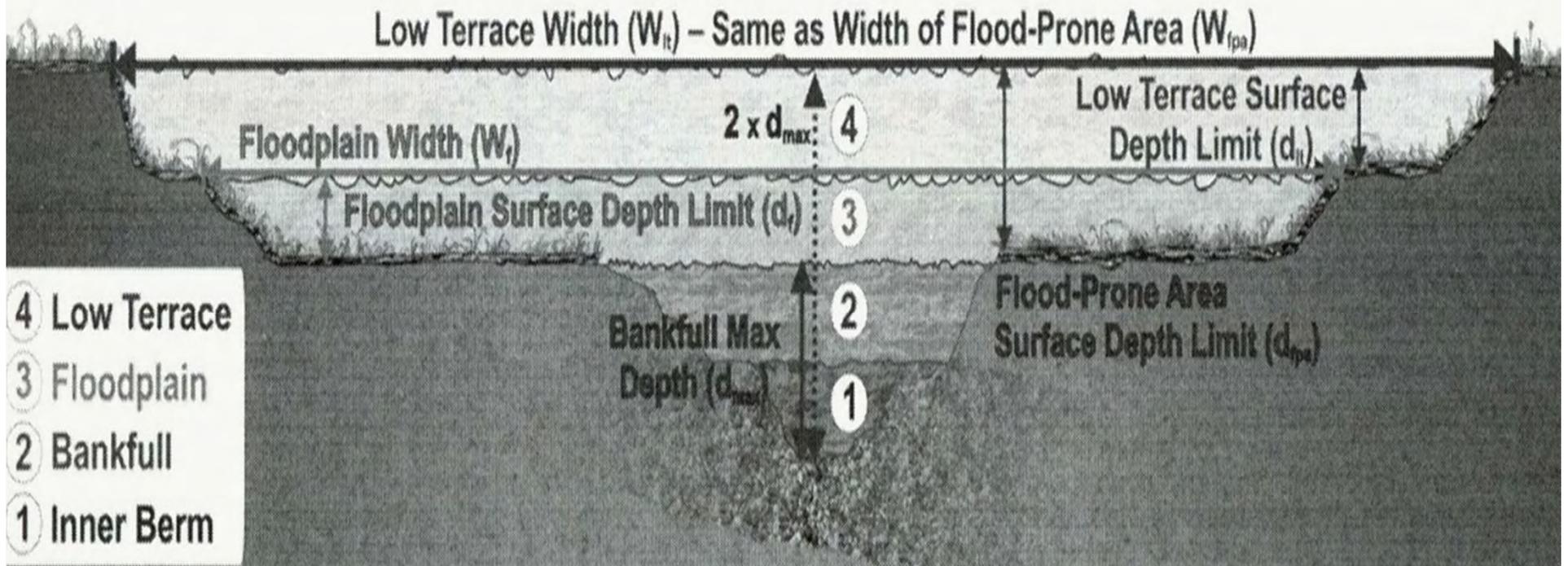
7-31-06



Flood-Prone Area Dimensions: Three-Stage Channel



Flood-Prone Area Dimensions: Four-Stage Channel



Berms



Berms = Failure



Berms = Failure



Floodplains



Floodplain Definition

The floodplain is the area bordering a stream, constructed by the river and inundated during periods of high flow.

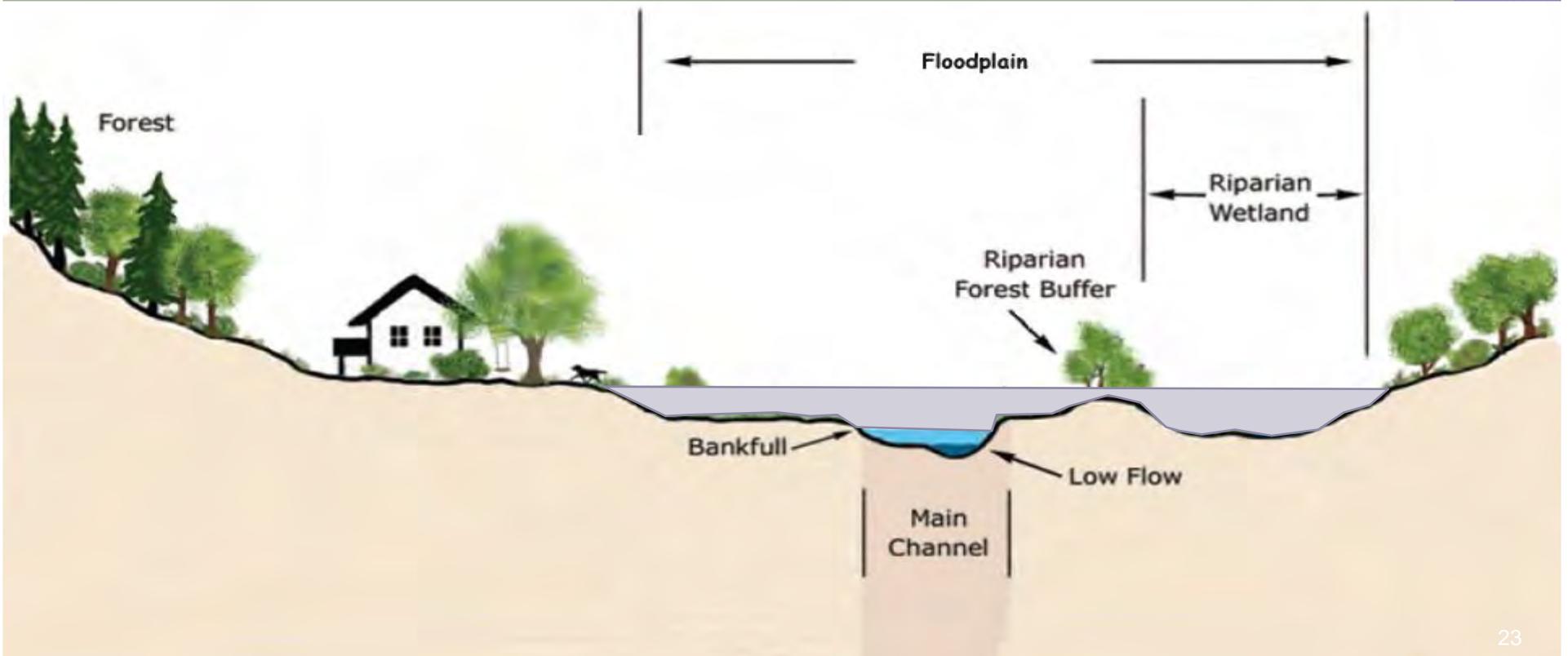


Floodplain Function

- ⊙ Energy dissipation during flooding events
 - Velocity and energy decreases
- ⊙ Lowers flood peaks due to storage and infiltration
 - Water released more slowly downstream
- ⊙ Provide a place for debris and sediment to be deposited
 - Natural process of topsoil formation

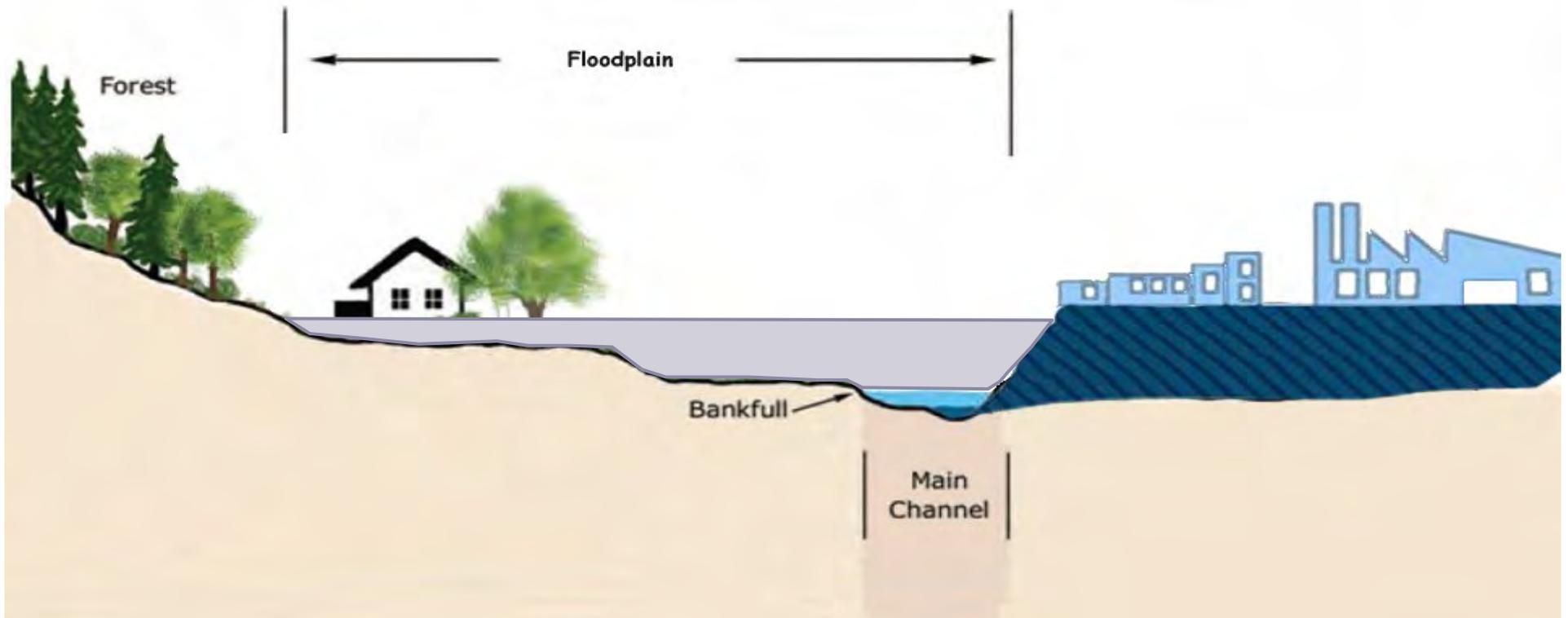
Floodplain

The floodplain is part of the river during storm conditions



Today's Floodplains are not necessarily Tomorrow's floodplain

If large areas of the floodplain are filled, then there will be an increase in the land area needed to store flood waters. This means your home, farm, or business may be impacted.



Development on the floodplain can lead to significant damage to infrastructure





08/28/2011









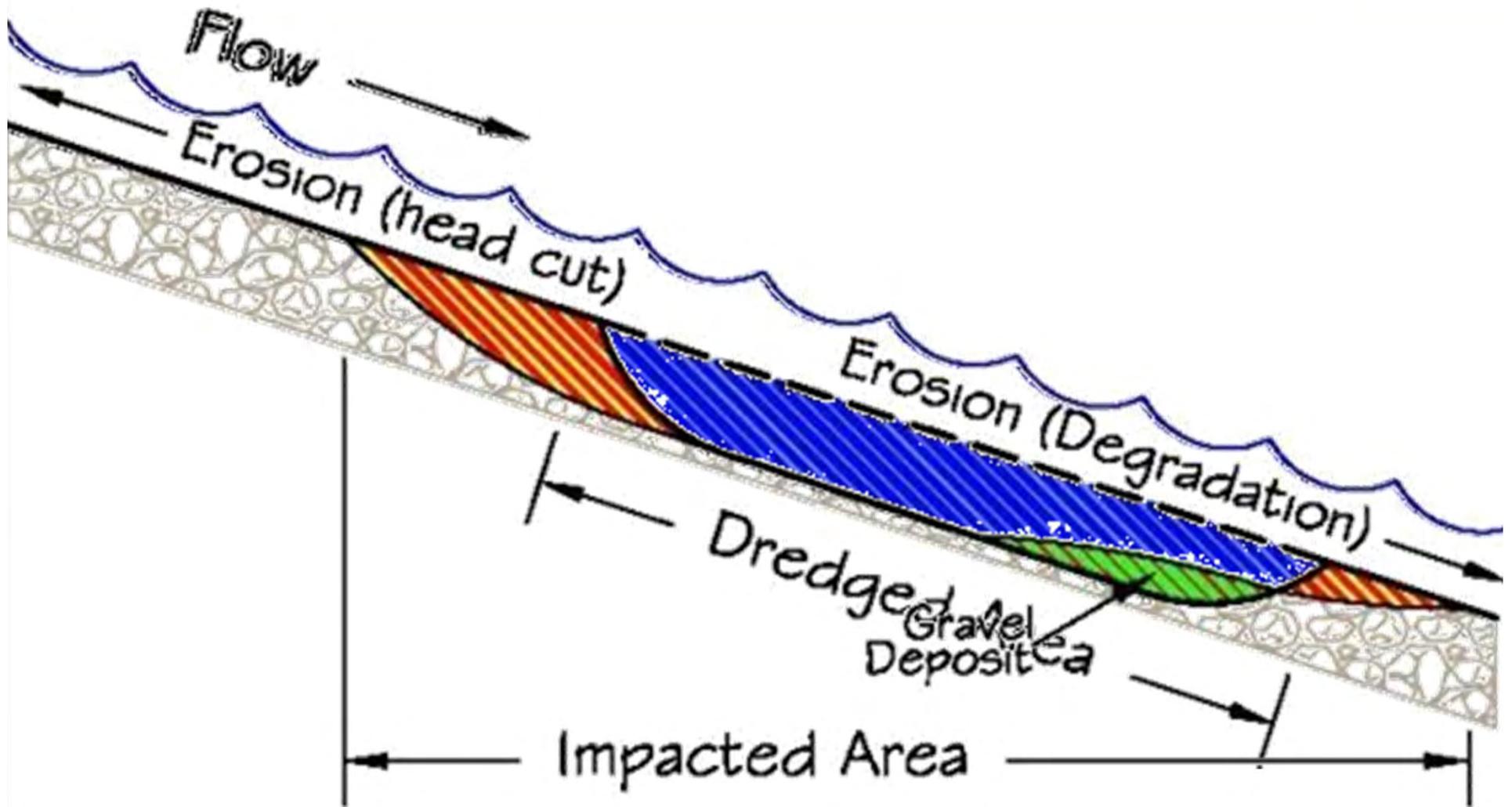






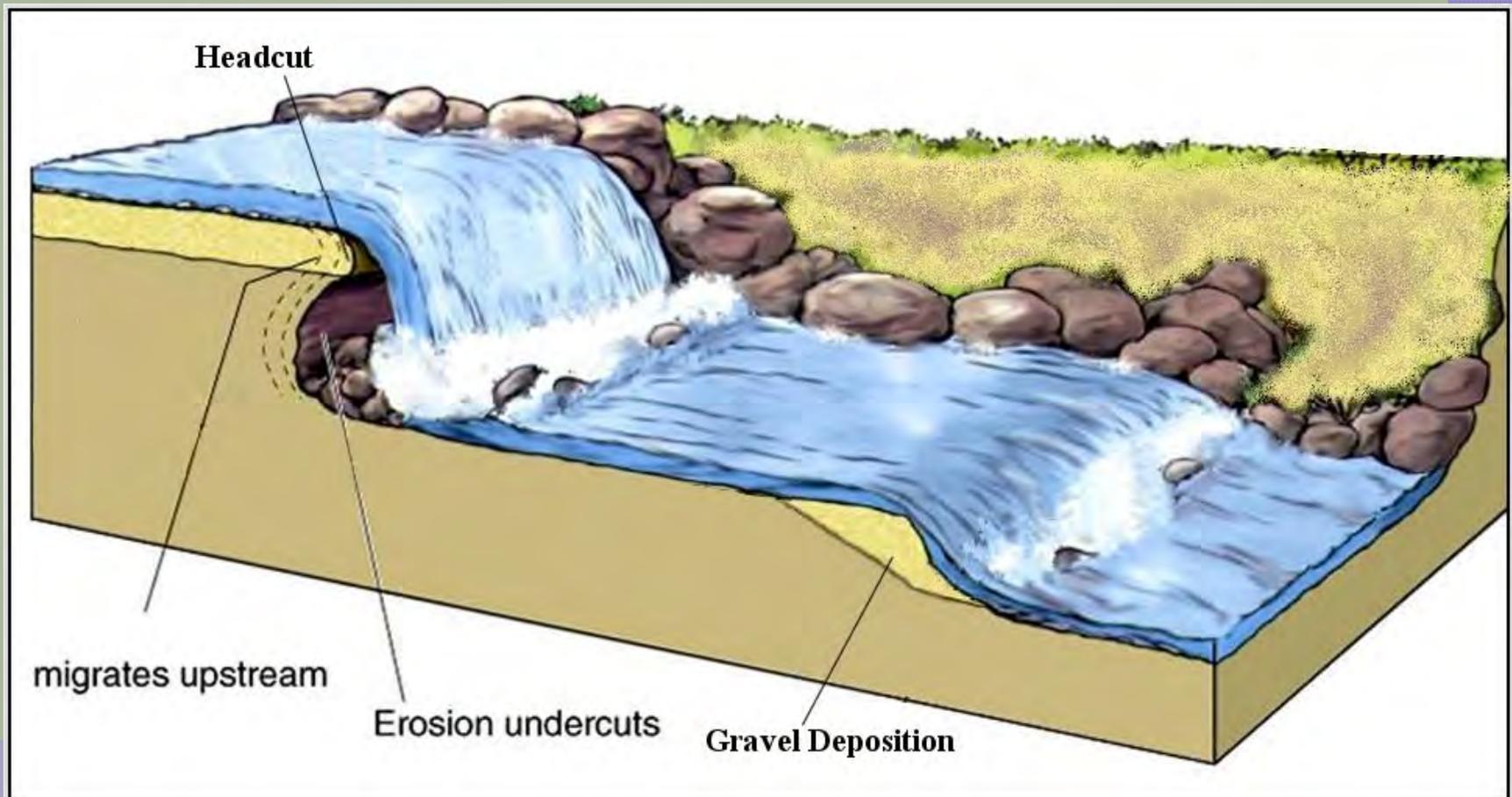
Impacts to Streams with Historic Maintenance Techniques

Dredging

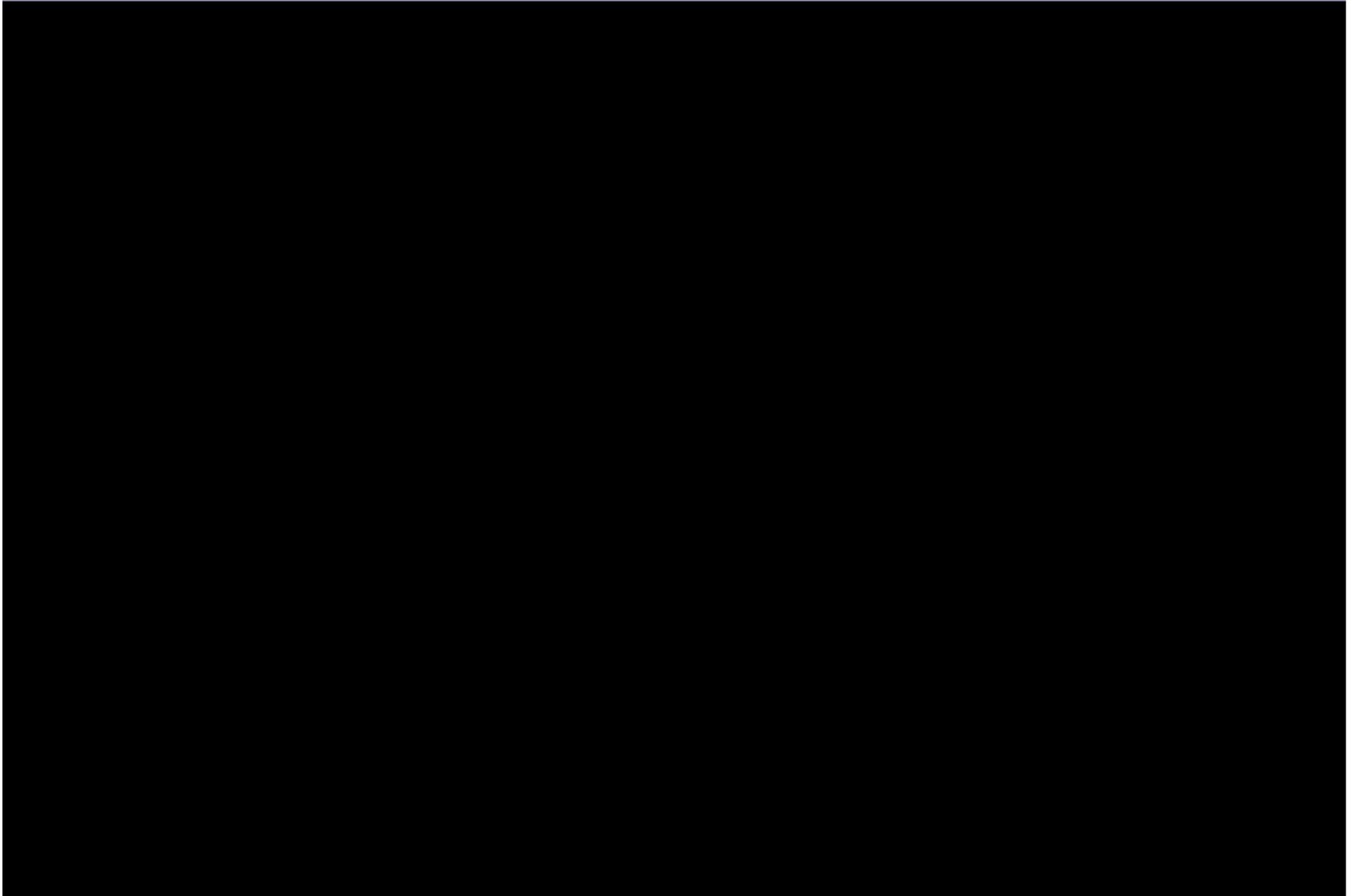


Head cut Definition

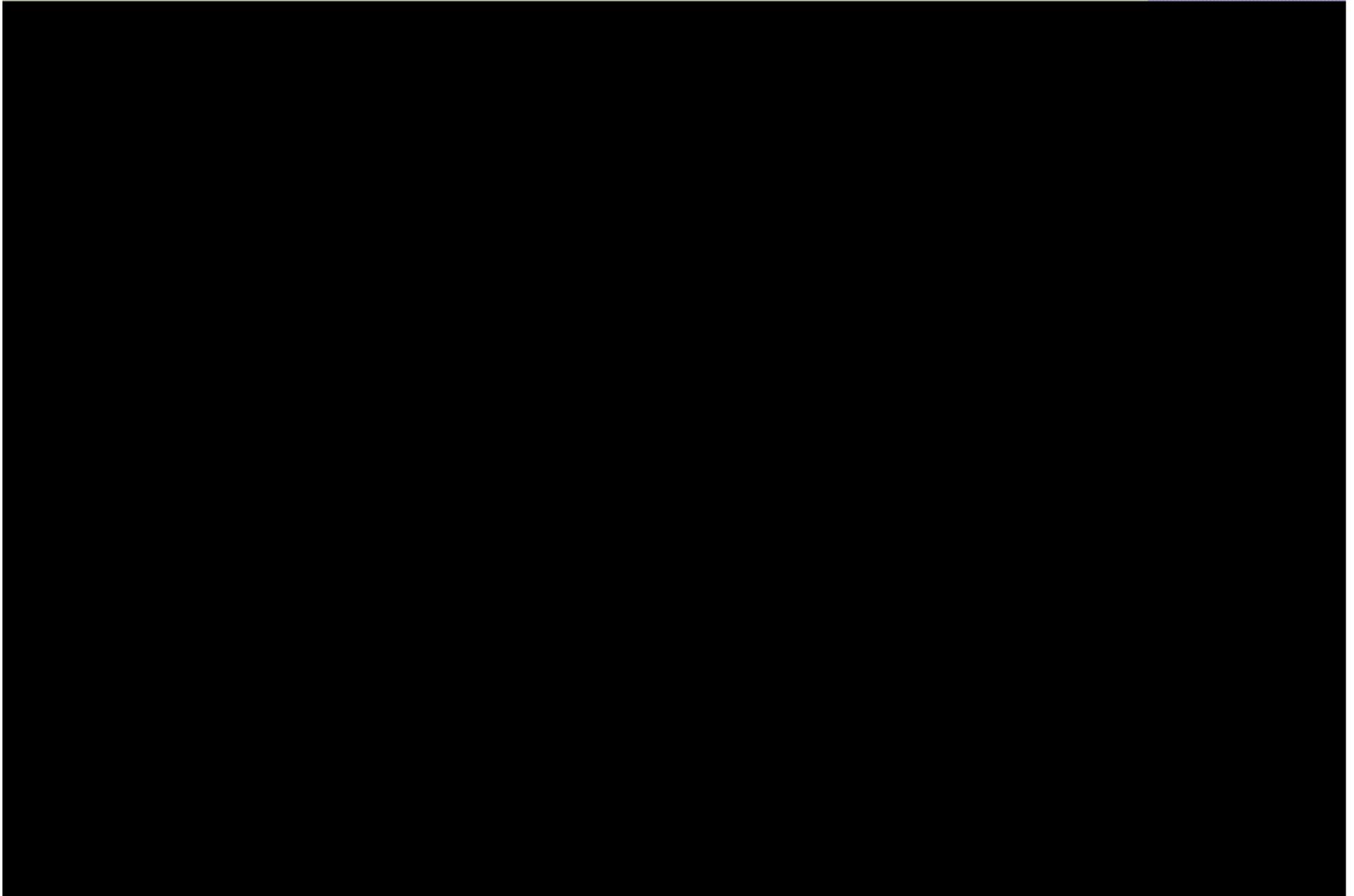
Instability that progress upstream and downstream from a local disturbance.



Headcut in Profile



Headcut & Floodplain Disconnect



Would you work here?



7-07-06 38



8-14-06



10-23-06



12-13-06



3-06-08

This downstream adjustment created a head-cut upstream...



10-23-06



10-23-06





New Approach to Stream Maintenance

Local Flood Analysis

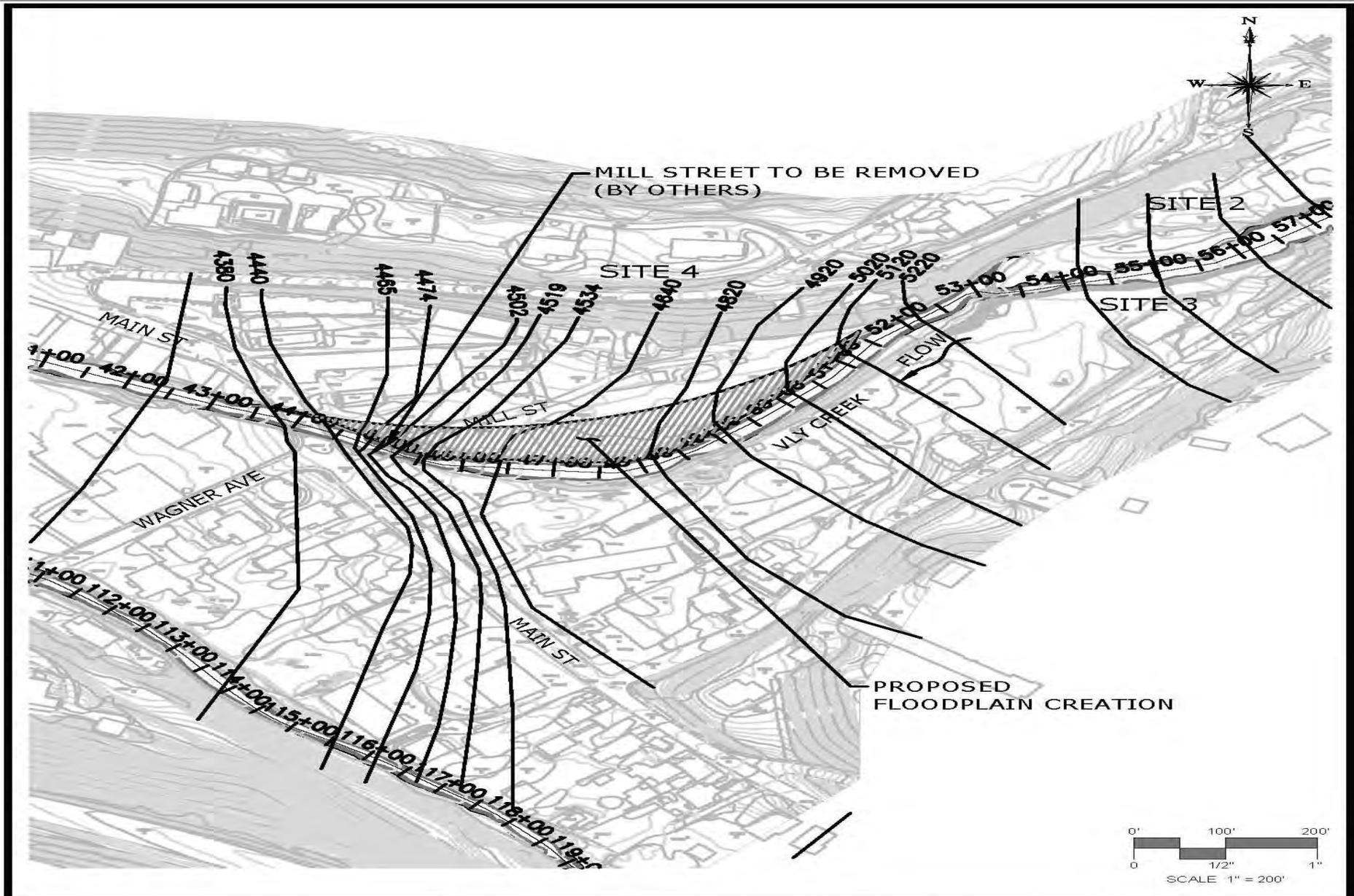
- What is it?
 - A two-phase, scientific analysis of a community's options for reducing flood risks
- Phase I
 - Flood Engineering Analysis:
 - *Identifies the specific causes of flood inundation hazards in population centers*
- Phase II
 - Local Flood Hazard Mitigation Plan:
 - Enhances the benefits and feasibility of each project selected in Phase I by the community and prepares a plan for implementing the projects viable after Phase II

Phase I – Flood Engineering Analysis

- Utilizes the Models that create the FEMA Flood Insurance Rate Maps
- Uses:
 - Latest Detailed Data on Precipitation and Runoff
 - Detailed Topography Data
 - Advanced Hydraulic Modeling software
- Evaluates:
 - Potential projects from each community's All-Hazard Mitigation Plan
 - Potential projects identified during public meetings
 - Potential projects revealed by the modeling
- Results in:
 - Engineering Analysis Report that identifies viable projects for Community review.

◎ The Engineering Analysis can:

- Identify the specific causes of flood inundation hazards in population centers
- Evaluate a range of potential solutions to these hazards and considers:
 - How many residences & businesses are helped?
 - Is the solution cost-effective?
 - How long will it last?
- Clarifies community readiness to implement the solutions evaluated



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SITE 4 - HEC-RAS SECTION LOCATION PLAN

**VLY CREEK
BANK AND CHANNEL RESTORATION**

VILLAGE OF FLEISCHMANN'S
DELEWARE COUNTY, NEW YORK

PROJECT PHASE: **PRELIMINARY DESIGN**

REV: ---

DATE **SEPT 4, 2012**

SCALE **1" = 200'**

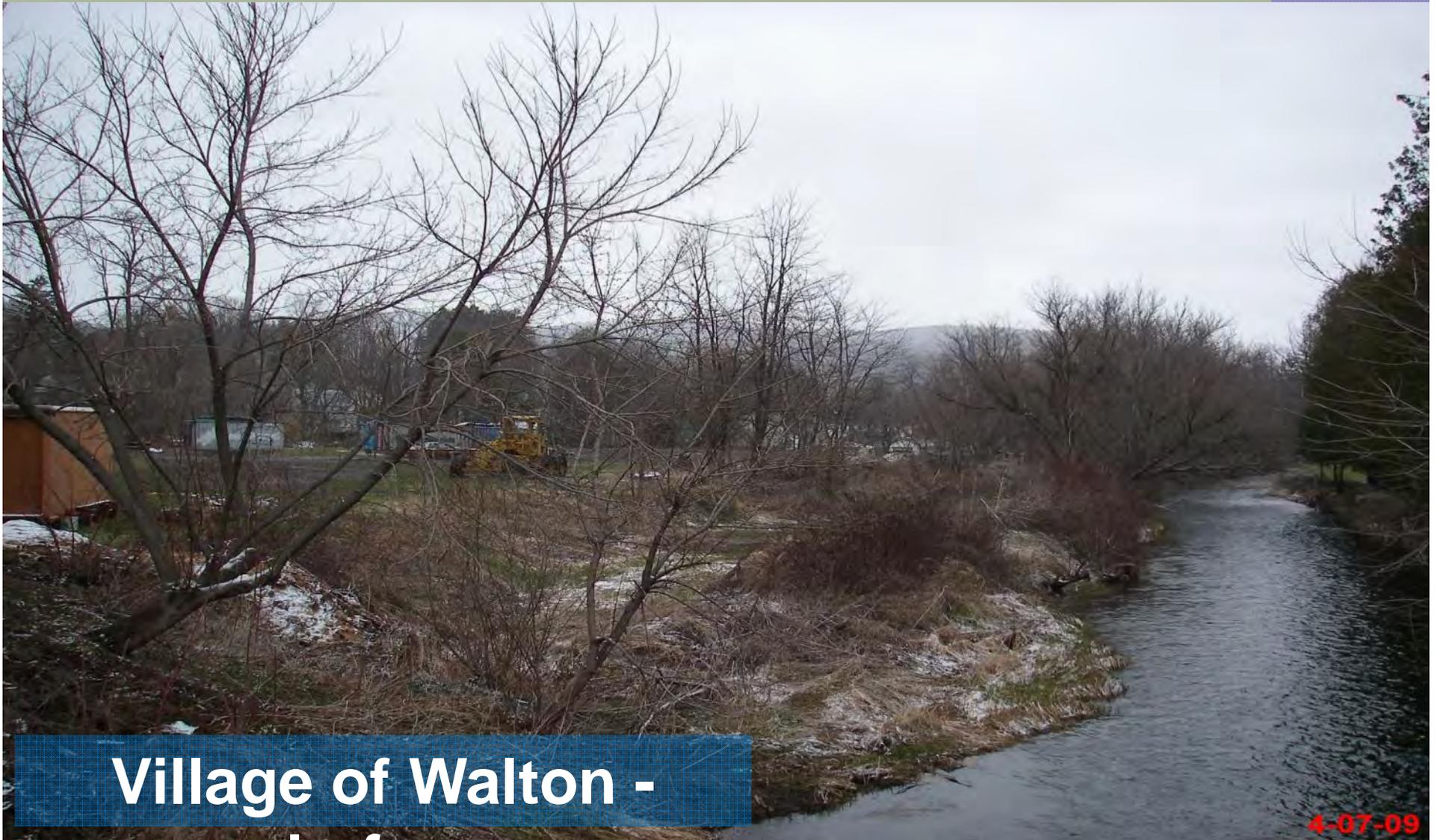
PROJ. NO. **3597-17**

DESIGNED JCM	DRAWN JCM	CHECKED JGM
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DRAWING NAME:

FIG. 1

What happens if we fill in floodplains for development?



Village of Walton -

4-07-09

What happens when streams are reconnected to their natural floodplains?



Village of Walton -

11-14-11



What Happens to flood elevations if we widen this structure so it is no longer a constriction?



What are the new flood elevations?



Community Benefits

◎ Phase I

- The community will get a scientifically based picture of the effects of flooding and what factors are contributing to the flood risks
- Solutions are based on *the most up-to-date information*:
 - Current stream condition*
 - Changes in precipitation*
 - The relative sustainability of different solutions*
- Eligibility for grant programs for implementation

◎ Phase II

- Better understanding of feasibility and effects of project implementation
- Increased opportunities for funding sources

Questions

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