

# MEMORANDUM

**TO :** Centerville Creek PRP - Project File 03-04-09


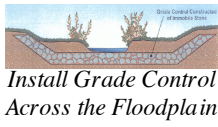

**FROM :** Marty Rye, Project Manager

**DATE :** JUNE 11, 2003

**REGARDING :** Preliminary Alternative Analysis Summary, Inter-Fluve Project # 03-04-09, Centerville Creek WI PRP - USACE Detroit District (Client Project No. Contract DACW57-01-D-0006; Delivery Order DC01 )

A dam was removed on Centerville Creek by the Wisconsin DNR in 1998. Several feet of sediment remain in the historical reservoir. This is contributing significant sediment to Lake Michigan and severely limits the habitat value of the reach and access to upstream reaches. A preliminary qualitative summary of the alternatives being considered for the preliminary restoration plan is provided below in Table 1.

*Table 1. Preliminary Summary of Alternatives Considered*

<b>Performance Criteria</b>	<b>Alternative 1 Do Nothing</b>	<b>Alternative 2 Raise Channel Invert</b>	<b>Alternative 3 Excavate Floodplain</b>
<i>Description</i>		 <i>Install Grade Control Across the Floodplain</i>	 <i>Excavate Floodplain &amp; Build Channel</i>
Flood Protection / Flood Hazard	No Change	No Change	Lower Regulatory Flood Profile
Erosion Impact to Lake Michigan by Stabilizing Banks	Continued Excessive Sediment Delivery	Reduce Sediment Delivery	Reduce Sediment Delivery
Fisheries Impact	Corridor Void of Fishery Habitat	Can be constructed to allow function	Restore corridor and project reach
Riparian Corridor	Disturbed Function	Disturbed Function	Restore Function
Protects Personal / Public Safety	No	Yes	Yes
Recreational Opportunities	None	Somewhat Enhanced	Enhanced
Consistent with Regulations / Federal Goals	No	Possible	Yes
Minimize Maintenance Costs	Yes	No, at some point (perhaps 50-years) it will have to be reconstructed	Yes
Project Life	Will 'heal' naturally – but will likely take > 100 years	Will provide short-term function until failure or need to reconstruct then will need to heal naturally or be reconstructed	N/A – Project will be self sustaining

### Discussion:

A general discussion of the alternatives is provided below.

#### **Alternative #1 - No Action**

The implications of no action were considered. Lateral migration of Centerville Creek will eventually scour out the floodplain and become a stable system that is reflective of its geomorphic influences. However, this process will require a long time period for recovery. Exactly how long this recovery will take is unknown, but it is reasonable to assume that full geomorphic recovery will take several decades and vegetative recovery will take a century or more. The implications of no action are as follows:

- Continued excessive sediment release to Lake Michigan
- Continued safety concerns associated with the incised channel
- Limited recreational use
- Limited aesthetic value
- Limited fishing opportunities
- Limited fishery potential for the upstream reaches

#### **Alternative #2 - Channel Elevation**

The second alternative examined was raising the channel bed elevation to reduce bank height and restore floodplain function. This would include the construction of multiple grade control structures across the valley width to provide a vertical transition between the channel invert downstream of the dam and the channel invert upstream of the dam's influence.

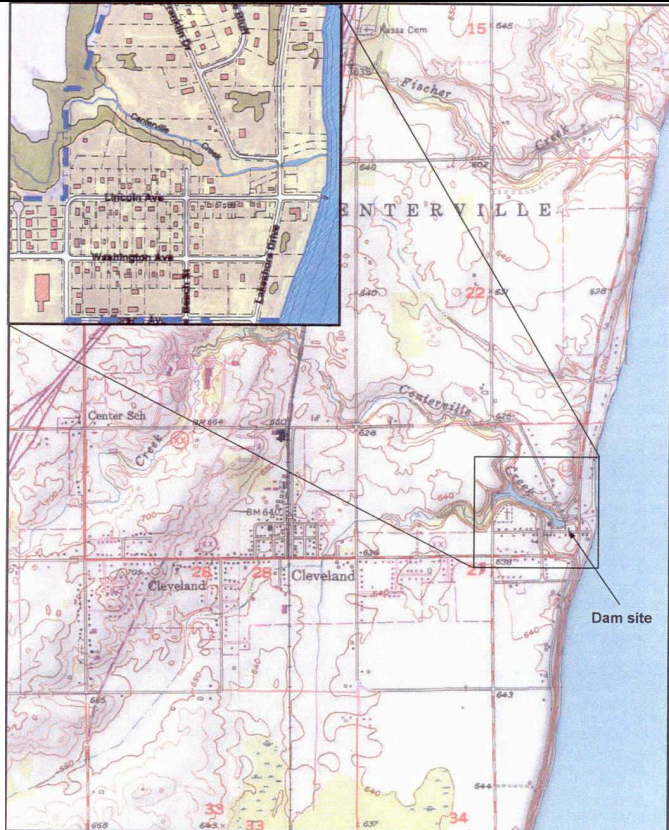
In effect this method would require constructing the historical grade control (dam) with multiple smaller grade control structures. These structures can be made of large rock material and designed to allow fish passage. A detailed cost estimate was not prepared for this alternative, but the construction cost would be significantly less than lowering the floodplain elevation.

However, construction of this type of system would not allow future lateral or vertical migrations that occur naturally and are an important part of functional riverine corridors. Raising the channel invert would give the appearance of a restored corridor but would not create a fully functioning riverine system. In addition, these grade control structures would require future maintenance effort and expense.

#### **Alternative #3 – Lowering Floodplain elevation**

The third alternative involves the excavation of the impounded sediments and restoration of the channel. Inter-Fluve Inc. believes that this plan mimics more closely the original, pre-dam stream condition and also represents the most geomorphically stable and environmentally sound restoration. This plan is the most expensive of the three alternatives, but this alternative eliminates sediment pollution, restores fish habitat and riparian function, allows for natural channel processes and provides aesthetic value.

Selected Photos of Site:



Project Site



Reservoir Prior to Dam Removal



Existing Reservoir



Existing Reservoir



Existing Reservoir (Winter)



Upstream Nickpoint