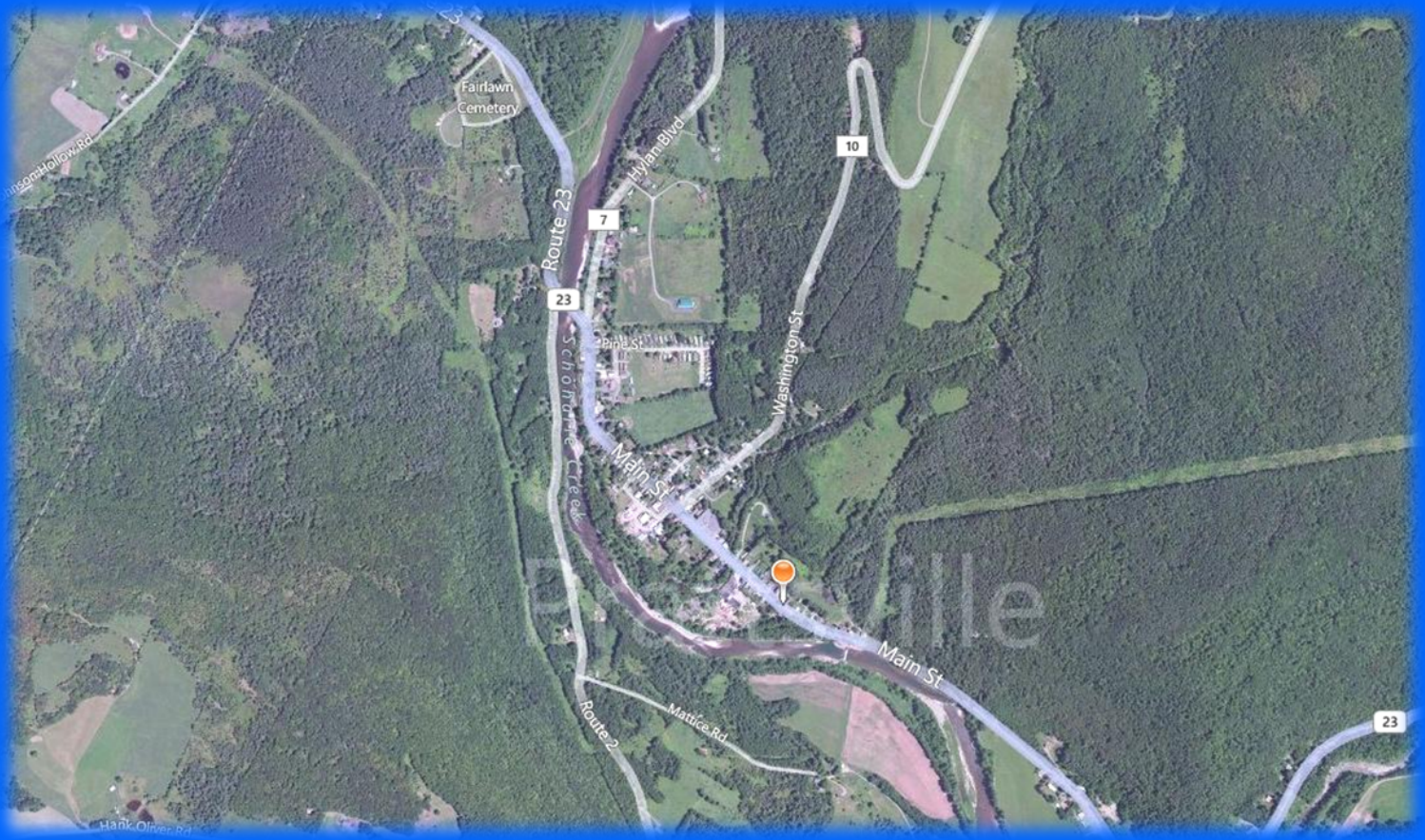
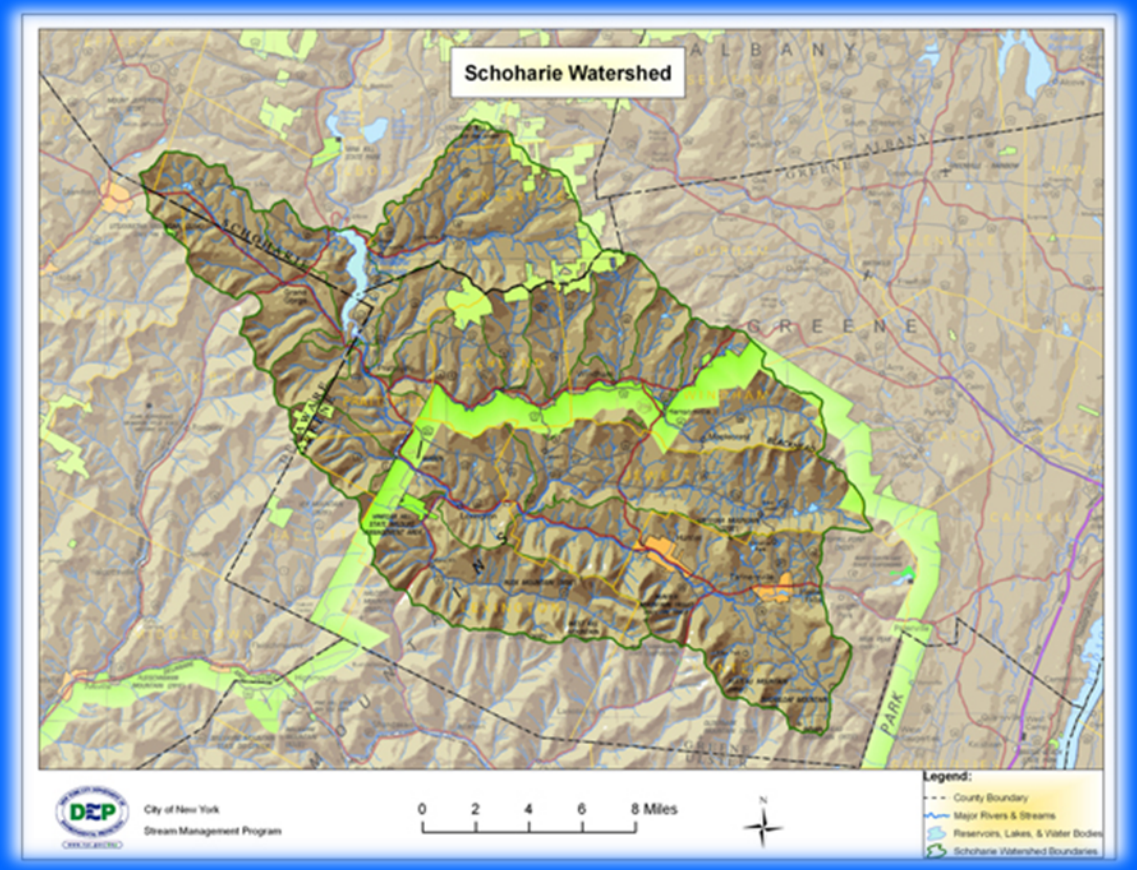
Schoharie Creek at Prattsville, NY



James G. MacBroom, P.E.
January 30, 2012
On Behalf of NYDEP

Watershed Characteristics



237 sq. miles

steep forest lands

narrow valleys

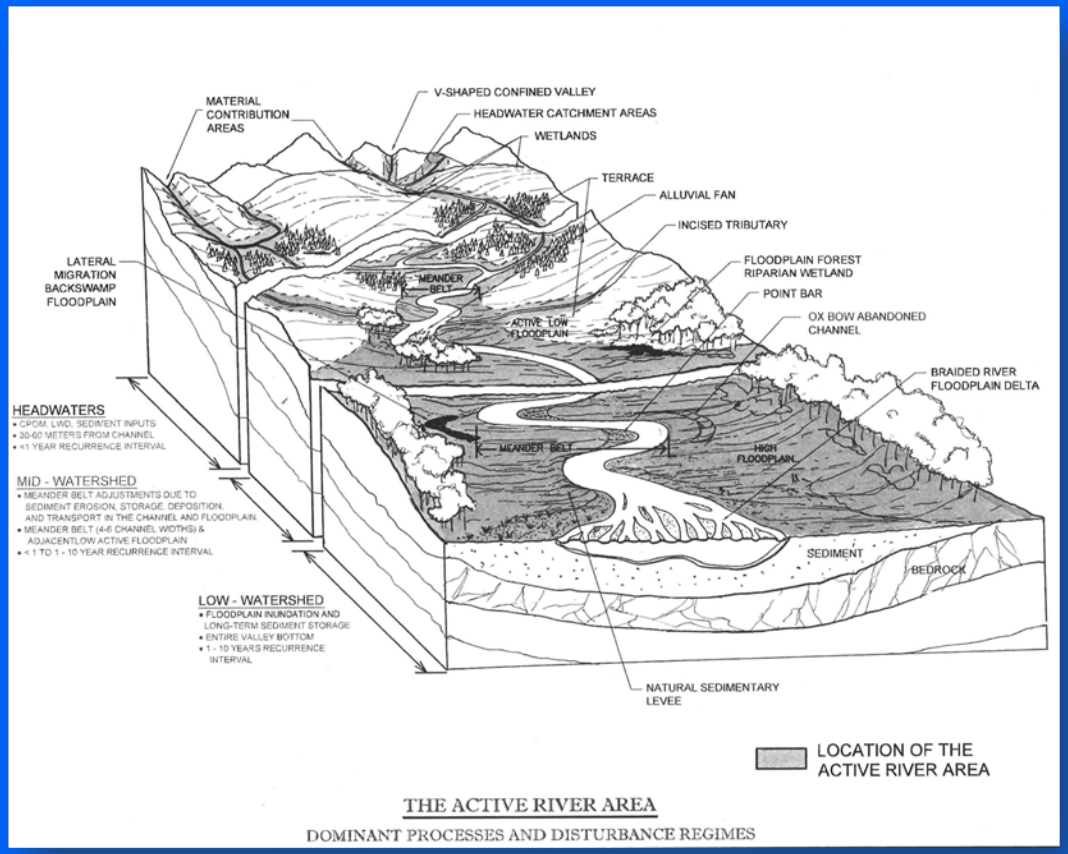
slightly sinuous gravel bed

semi-confined with alternating floodplains

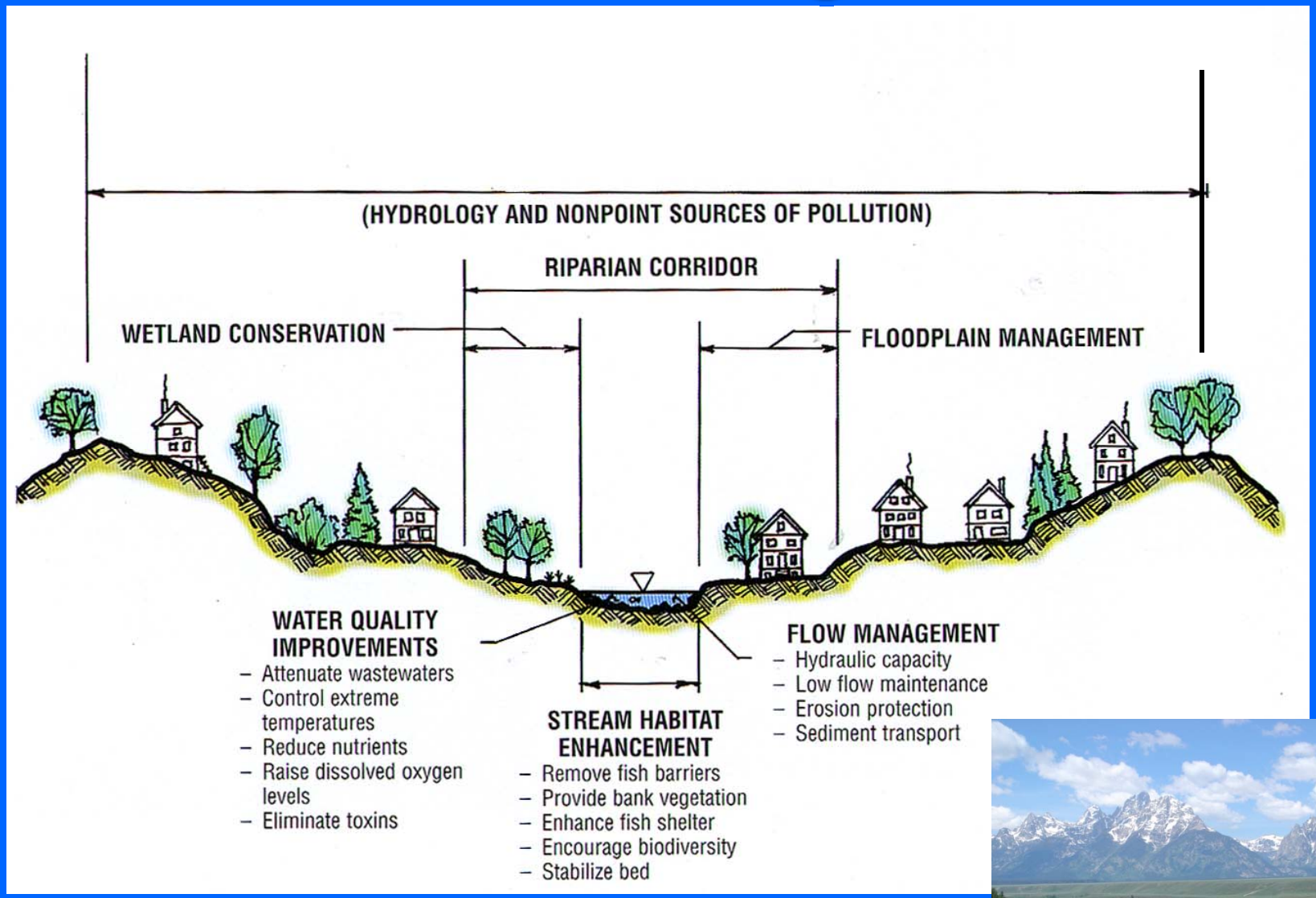
slope near Prattsville is 0.002 ft/ft

River System Elements

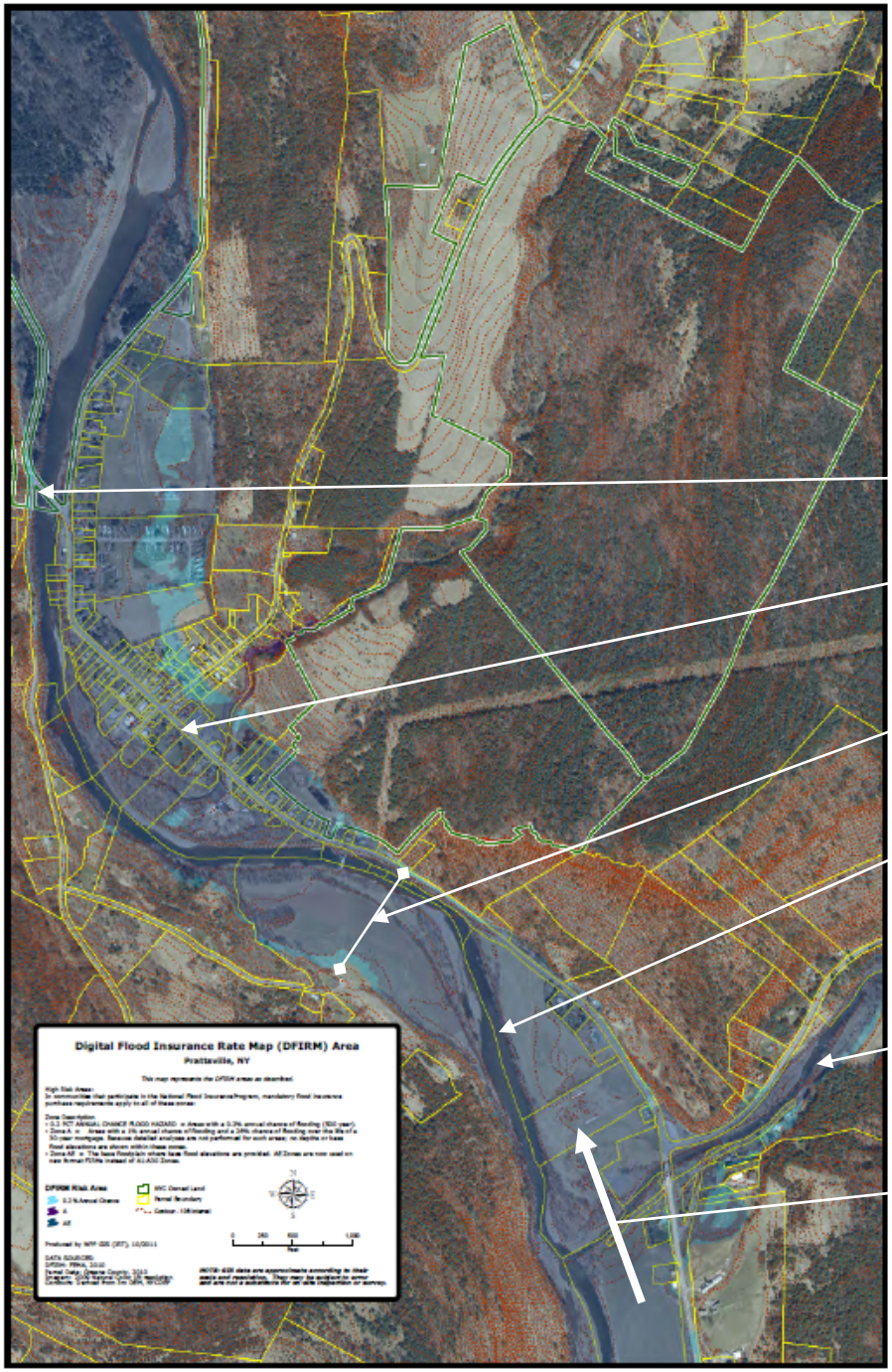
- Thalweg
- Channel
- Channel Banks
- Riparian Wetlands
- Floodplains
- Terrace Scarps
- Terraces



Watershed Management



FEMA Floodplain Map



Rte 23 Bridge

Downtown Prattsville

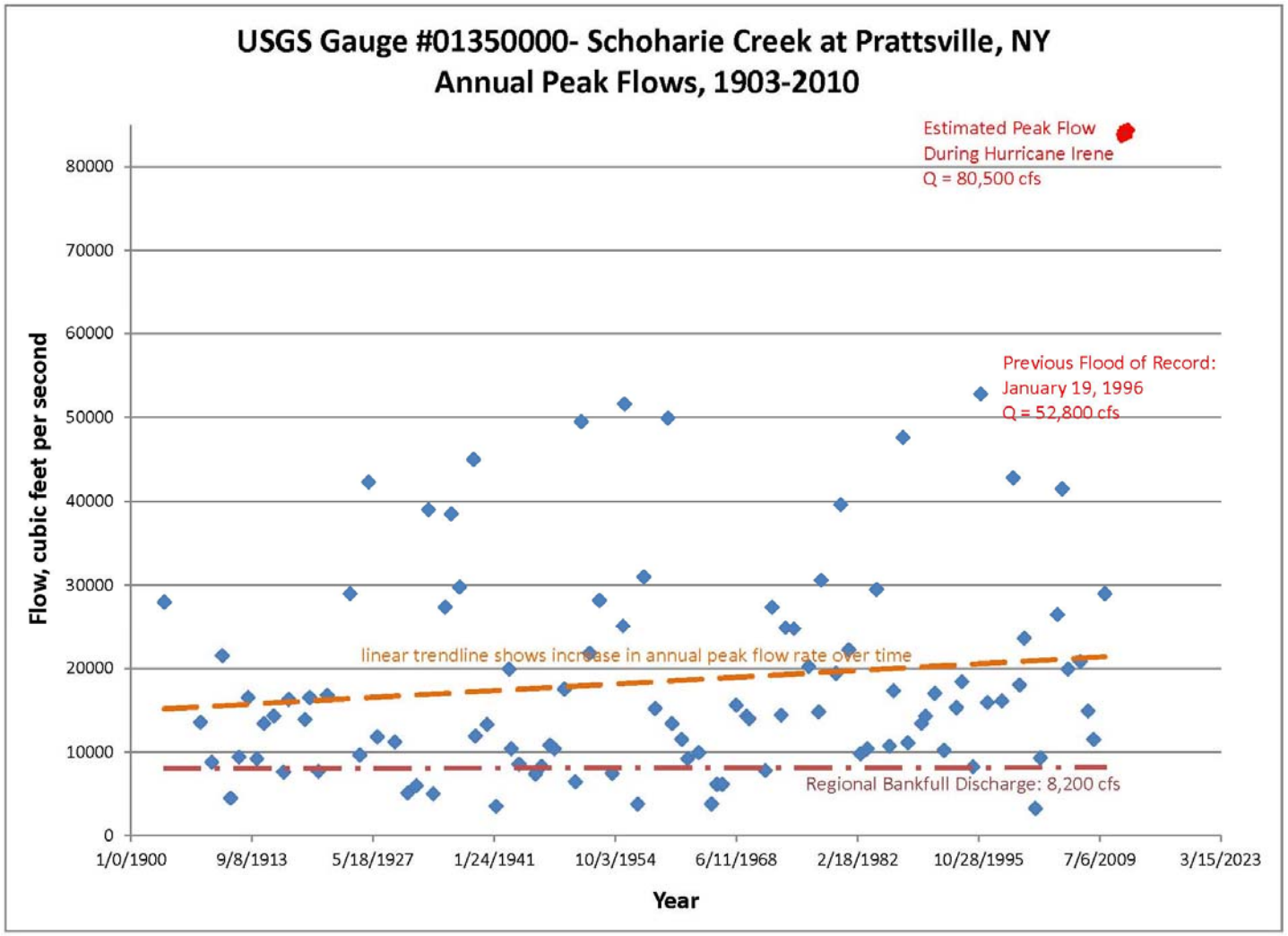
Floodplain

Schoharie Creek

Batavia Kill

Flow Direction

Schoharie Creek Hydrology



Huntersfield Creek

USGS New York StreamStats

Streamstats Ungaged Site Report

Date: Fri Jan 27 2012 07:56:09 Mountain Standard Time
Site Location: New_York
NAD27 Latitude: 42.3138 (42 18 50)
NAD27 Longitude: -74.4314 (-74 25 53)
NAD83 Latitude: 42.3139 (42 18 50)
NAD83 Longitude: -74.4310 (-74 25 51)
ReachCode: 02020005000220
Measure: 7.12
Drainage Area: 7.8 mi2
Percent Urban: 0.11 %

Peak Flows Region Grid Basin Characteristics
100% 2006 Full Region 3 (7.8 mi2)

Parameter	Value	Regression Equation Valid Range	
		Min	Max
Drainage Area (square miles)	7.8	0.41	3480
Lag Factor (dimensionless)	0.0318	0.002	20.582
Mean Annual Runoff in inches (inches)	22	16.86	40.73
Median Seasonal Maximum Snow Depth (inches)	17.6	13.02	20.42

Bank Full Region Grid Basin Characteristics
100% Bankfull Region 4 SIR2009 5144 (7.8 mi2)

Parameter	Value	Regression Equation Valid Range	
		Min	Max
Drainage Area (square miles)	7.8	3.72	237

Peak Flows Region Grid Streamflow Statistics

Statistic	Flow (ft^3/s)	Prediction Error (percent)	Equivalent years of record	90-Percent Prediction Interval	
				Minimum	Maximum
PK1_25	241	26	5.1		
PK1_5	307	24	8.4		
PK2	409	24	5.4		
PK5	710	20	11		
PK10	970	19	19		
PK25	1360	17	36		
PK50	1710	15	54		
PK100	2100	15	77		
PK200	2530	14	100		
PK500	3140	14	130		

Bank Full Region Grid Streamflow Statistics

Statistic	Flow (ft^3/s)	Estimation Error (percent)	Equivalent years of record	90-Percent Prediction Interval	
				Minimum	Maximum
BFAREA	88.3	35			
BFDPTH	2.04	19			
BFFLOW	582	59			
BFWDTH	44	26			

Bridge Opening 6 Ft High by 52 Ft Wide

Waterway Area is 312 Sq Ft

Single Span, no piers

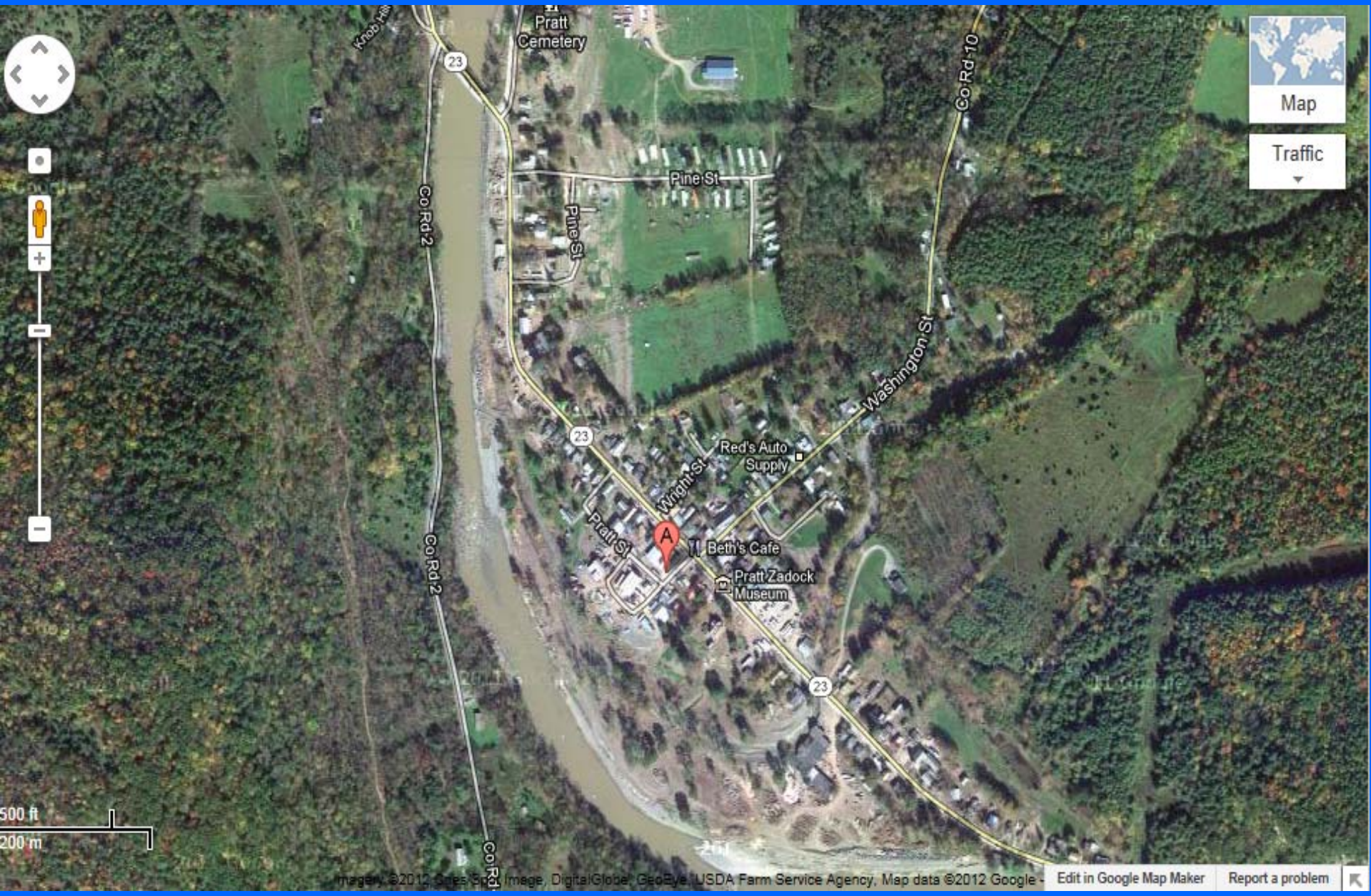
Base Flood is 2100 CFS

Gross Velocity is 7 FPS

Measured Channel Width is 36 Ft

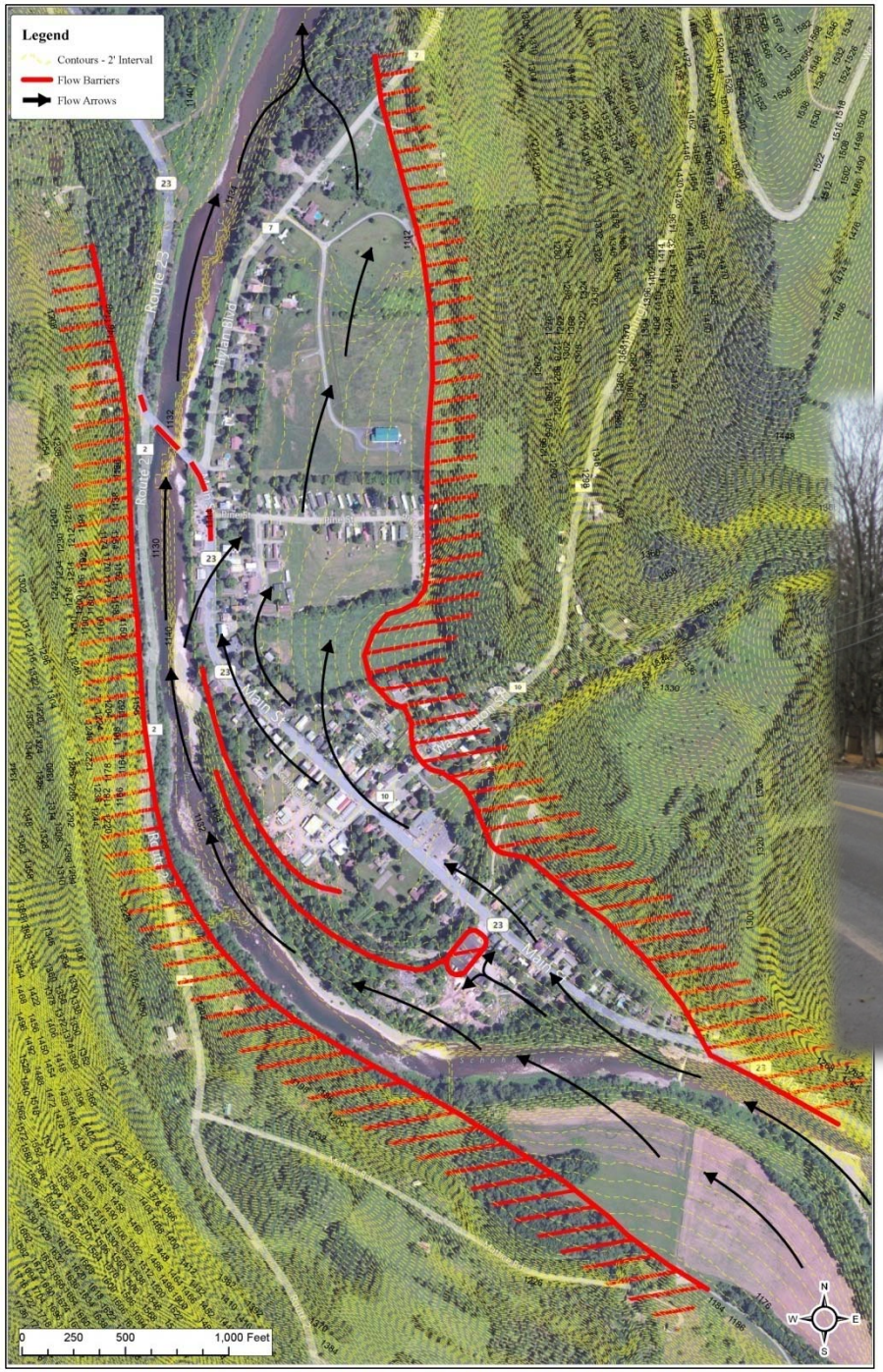
Regional Bankfull Width is 42 Ft

Conclusion; Bridge Size is Reasonable

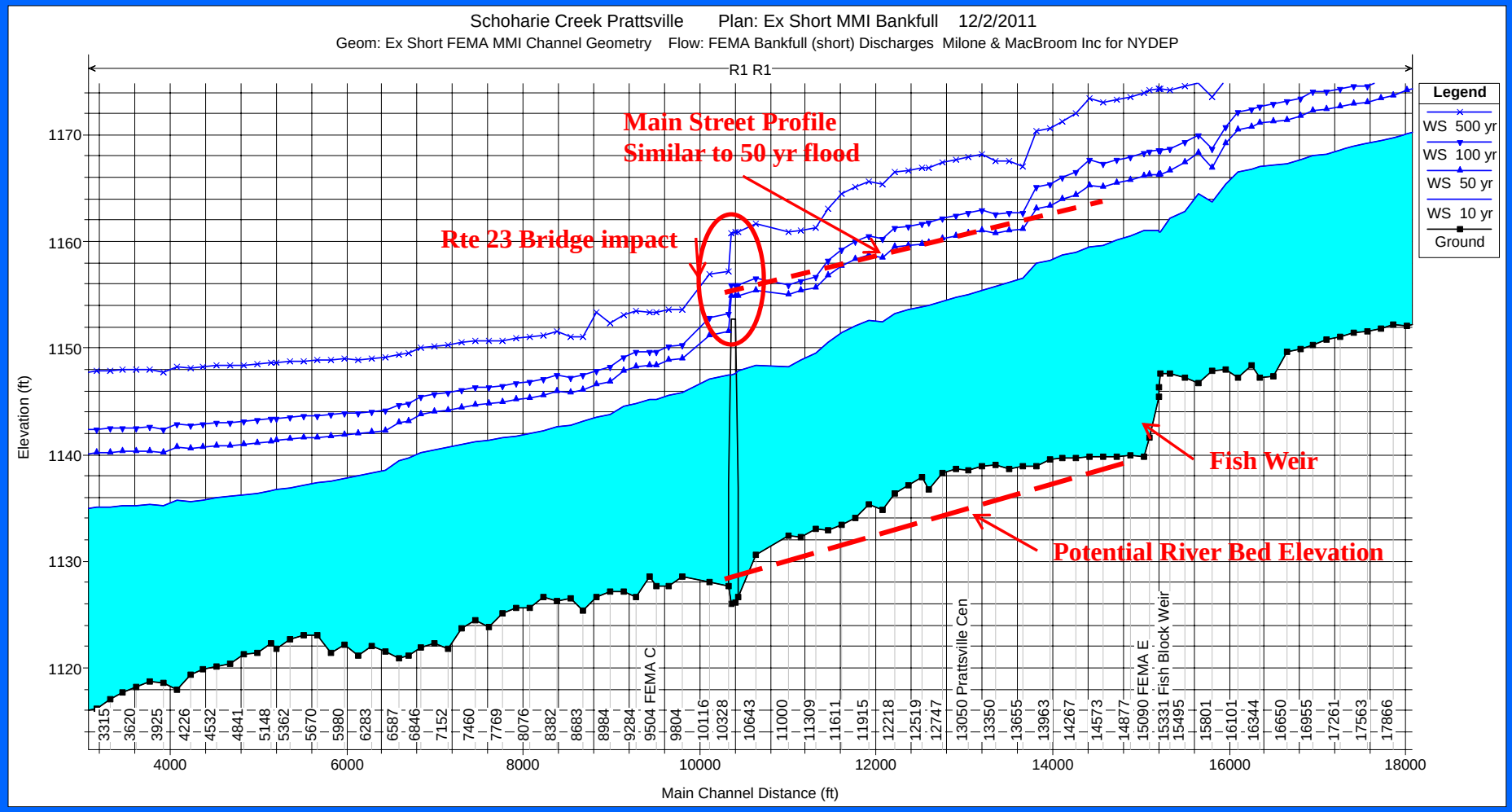

Pratt Cemetery
Knob Hill
23
Co Rd 10
Map
Traffic
Pine St
Pine St
Co Rd 2
Co Rd 2
Washington St
23
Red's Auto Supply
Wright St
Pratt St
A
Beth's Cafe
Pratt Zadock Museum
23
500 ft
200 m
Imagery ©2012 Sites Spot Image, DigitalGlobe, GeoEye, USDA Farm Service Agency, Map data ©2012 Google -
Edit in Google Map Maker
Report a problem

Pine St
Pine St
Pine St
Map
Traffic
23
Co Rd 2
Co Rd 2
Washington St
5456
Red's Auto Supply
Creamery Ln
Wright St
23
Pratt St
Beth's Cafe
A
Washington St Ext
Pratt Zadock Museum
200 ft
100 m
Edit in Google Map Maker
Report a problem

Flowage Barriers and Vectors

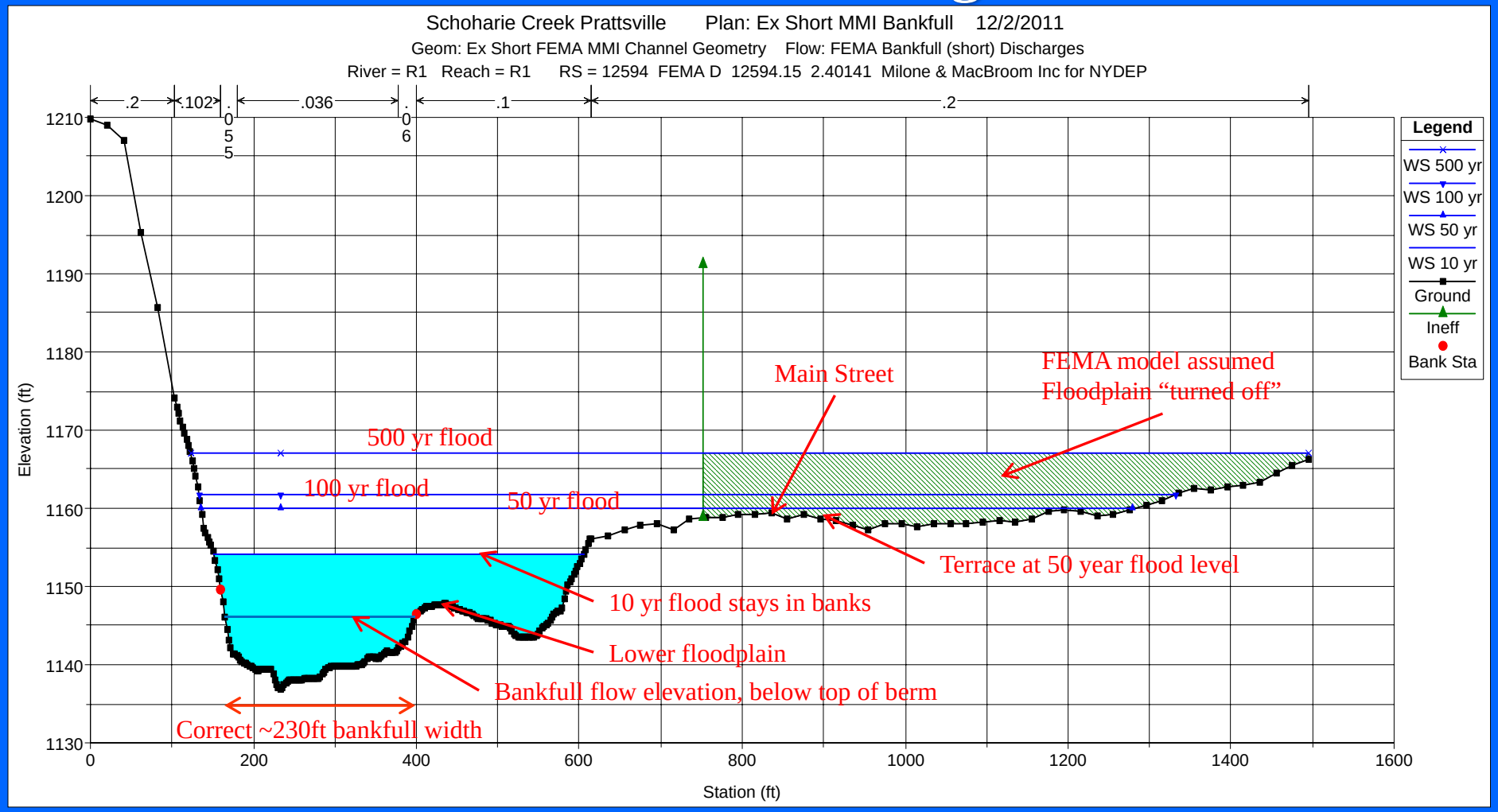


Existing Flood Profiles

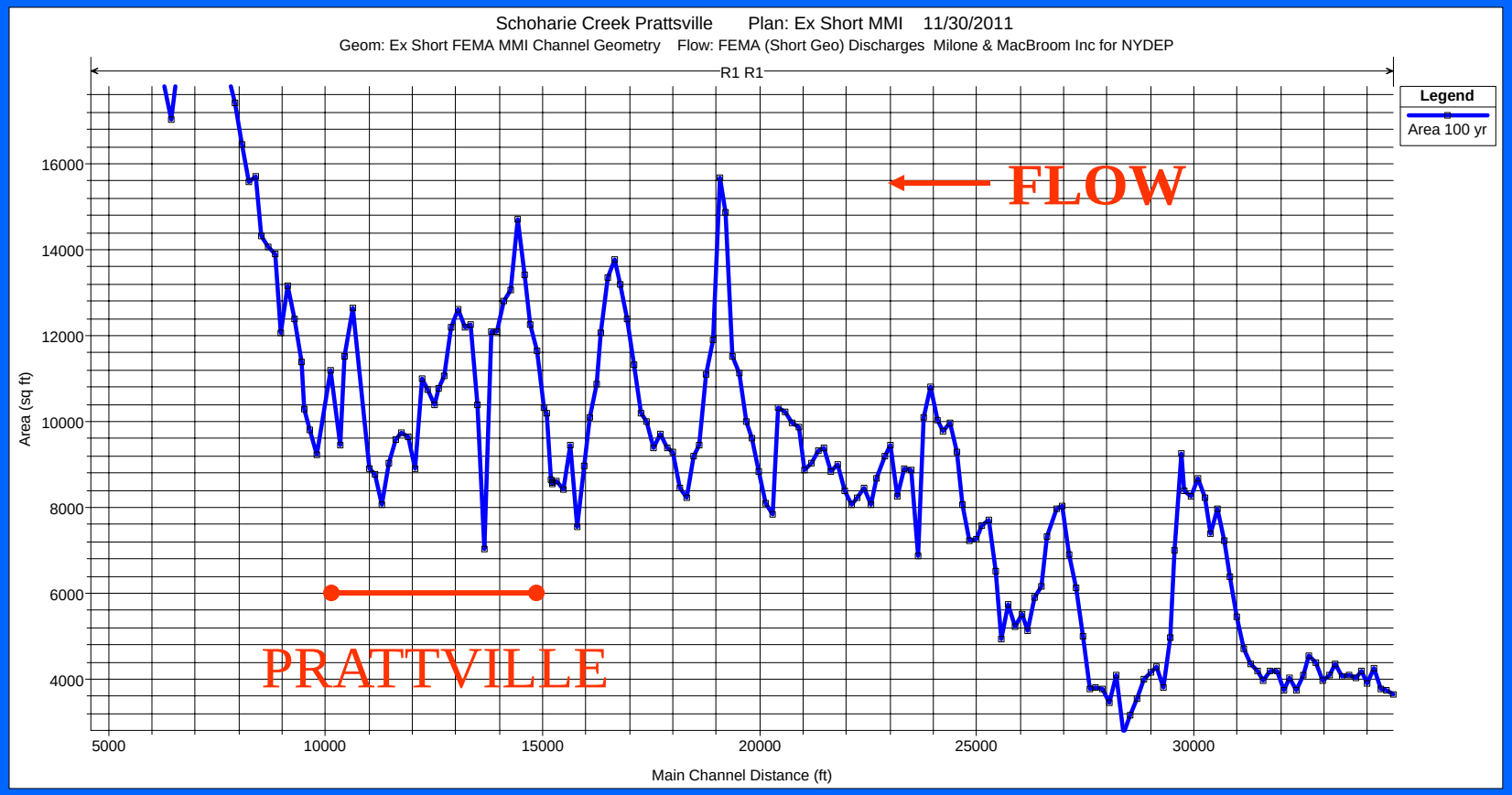


Existing Section D

Center of Prattsville- Existing Conditions



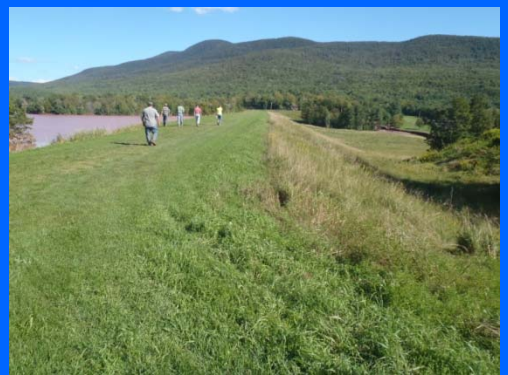
Total Flow Cross Section Area



Flood Hazard Reduction

Hydrologic Techniques:

- Reduce or contain peak flow rates at watershed scale
- Floodwater storage dams, wetland preservation, restoration of floodplain connectivity
- Example: NRCS floodwater storage dams in the Batavia Kill



Flood Hazard Reduction

Hydraulic Techniques:

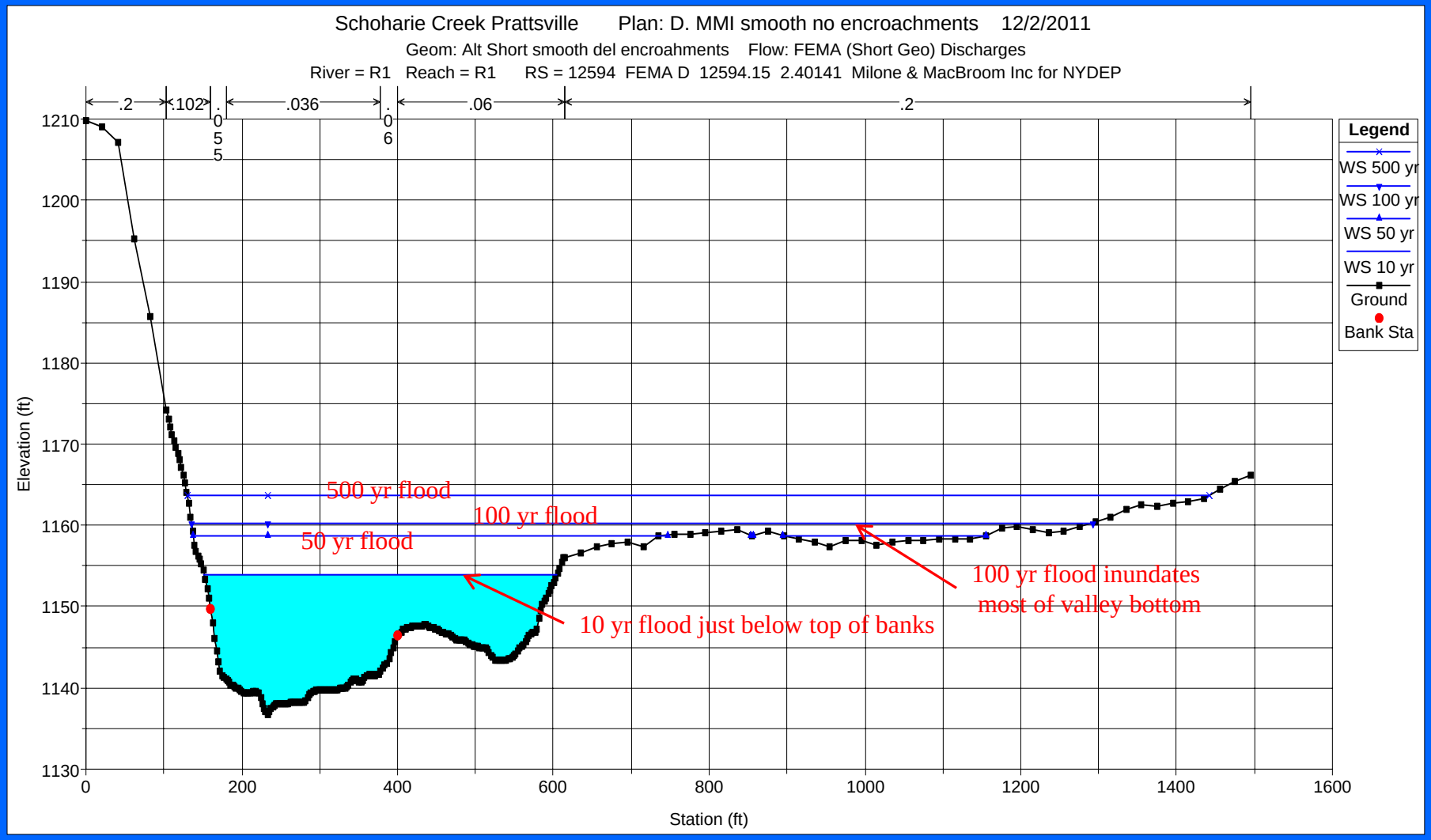
- Decrease flood water elevations
- Remove or reduce flow contraction points at bridges or narrow channel sections
- Increase flow capacity of channels and floodplains
- Use broad low velocity floodways
- Divert floodwaters around sensitive areas

Flood Hazard Reduction

Barrier Techniques:

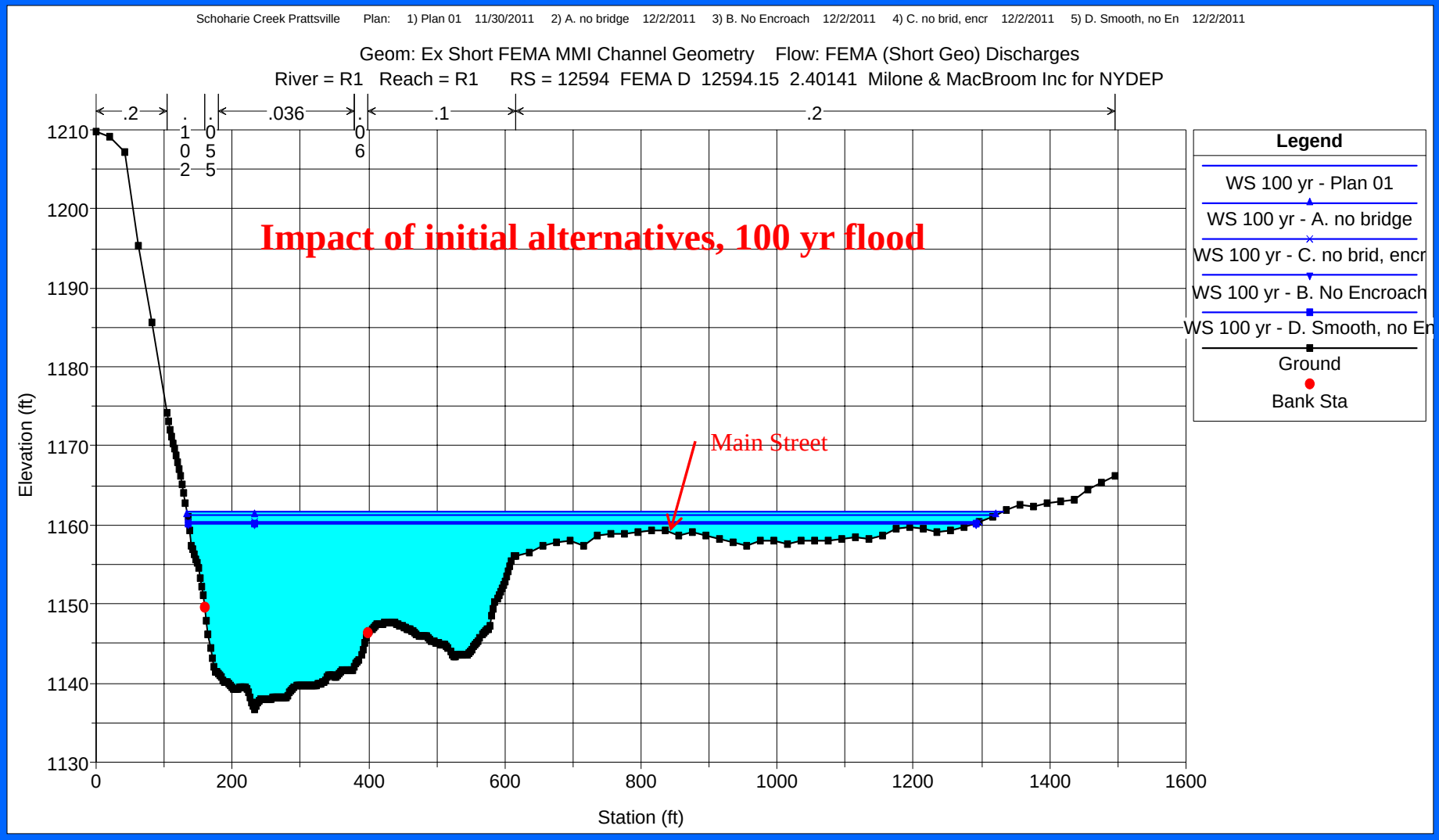
- Physically separate floodwaters from developed areas
- Install levees, floodwalls, or fill material
- Could require interior drainage pump stations, removable panels at road crossings, and considerable maintenance

Cross-Section w/ Deleted Encroachments



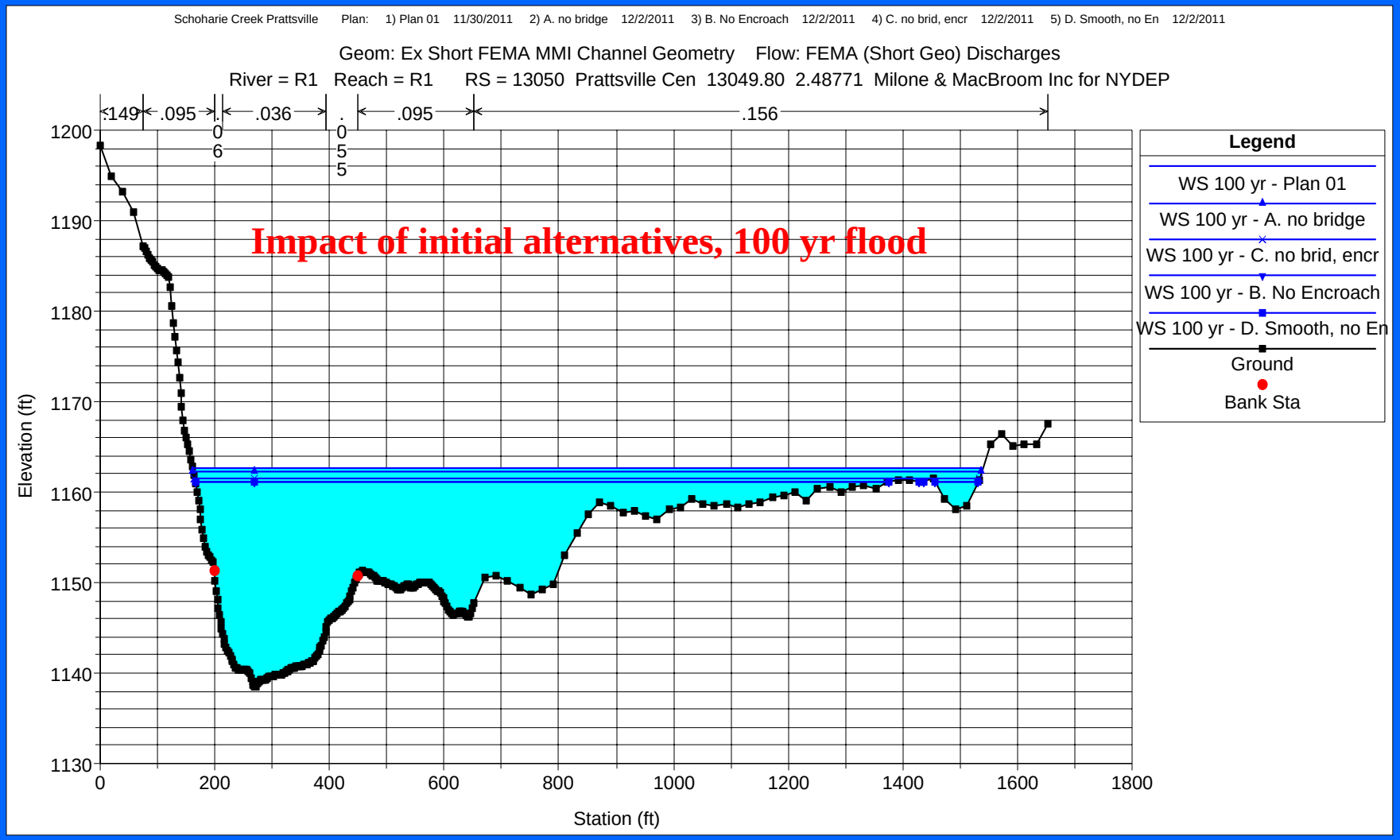
Alternate Comparison

Center of Prattsville

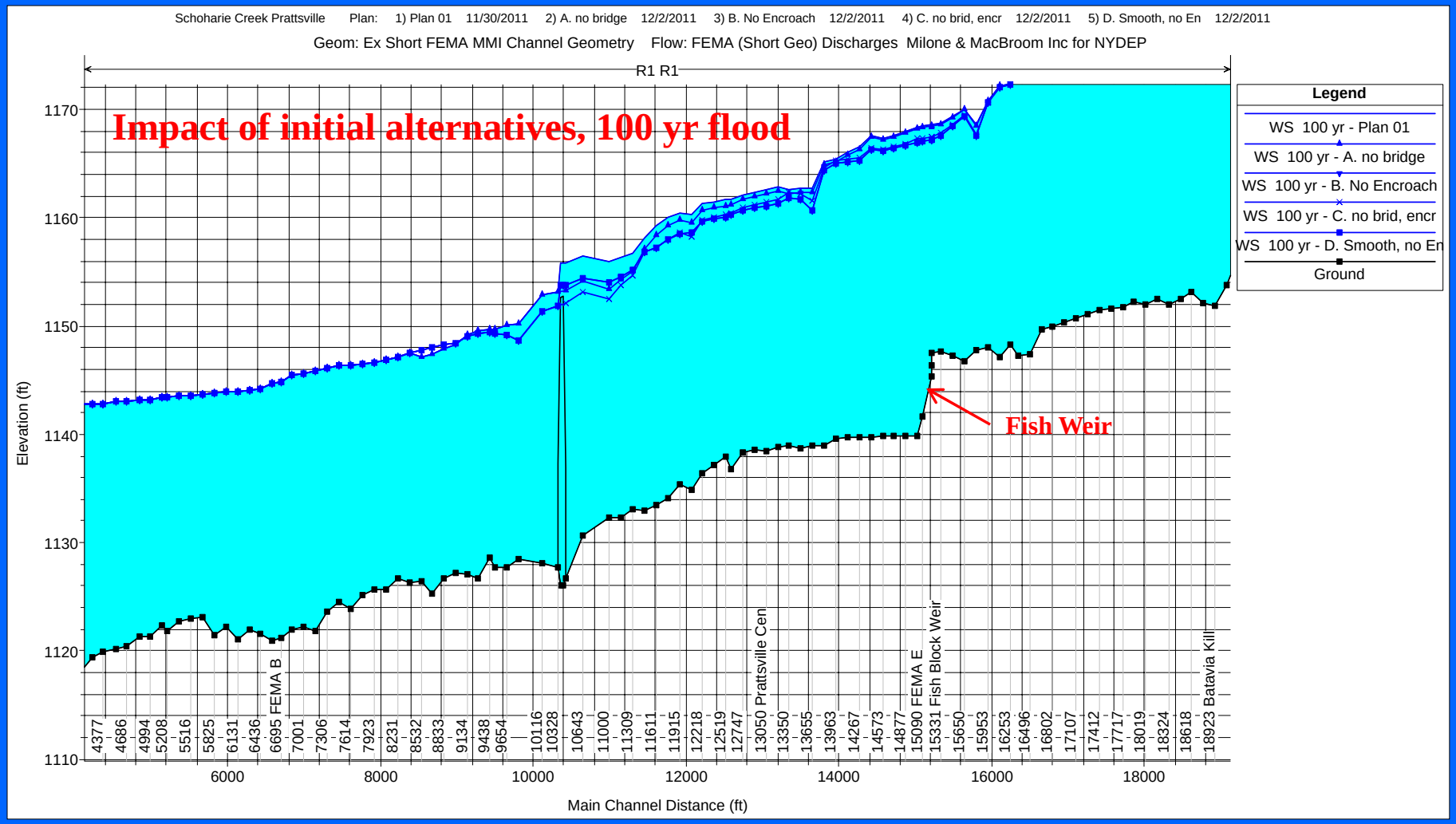


Alternate Comparison

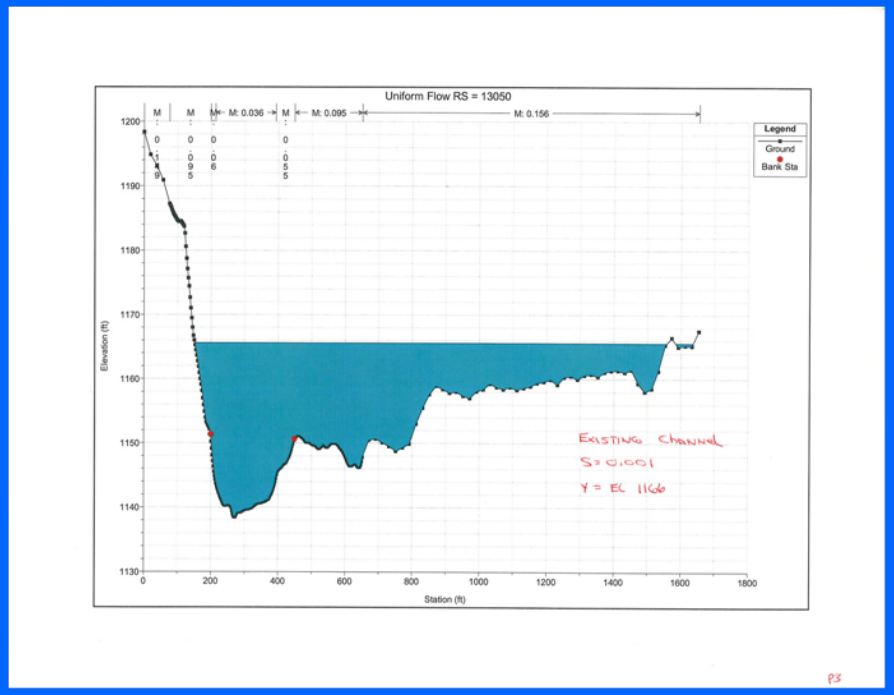
500 feet downstream of Center of Prattsville

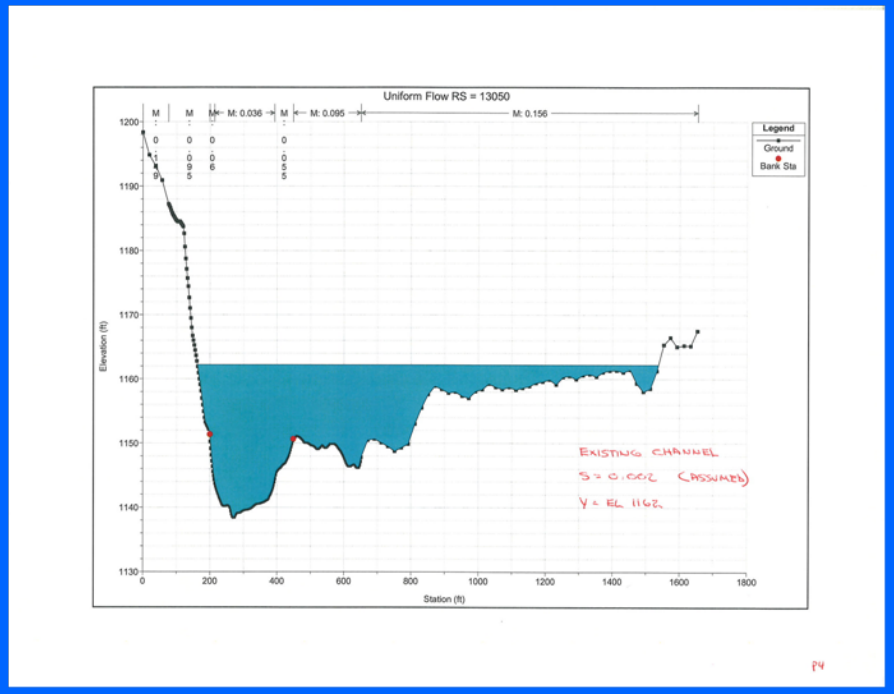


Profile Comparison

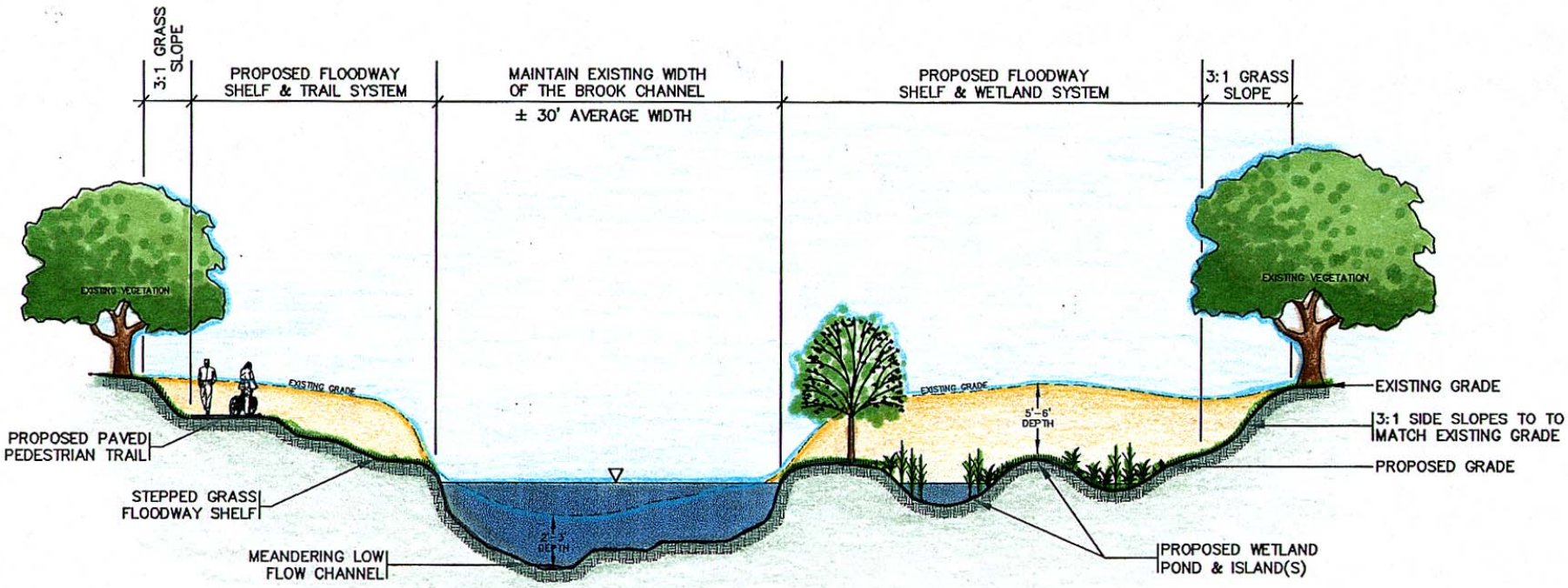


Effect of Slope





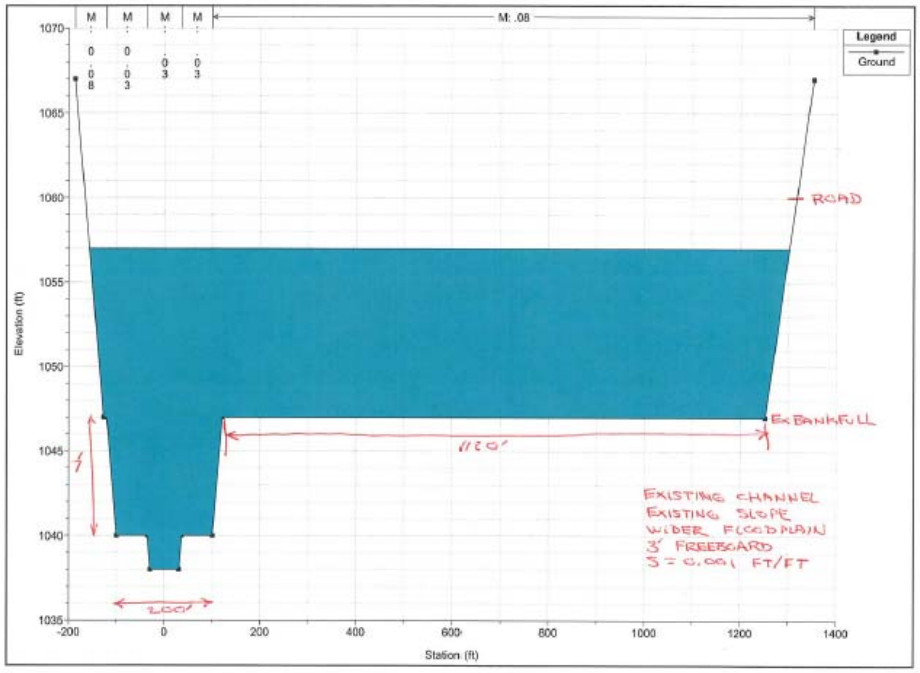
Increasing Slope Reduces Water Elevation Almost 4 Feet



TYPICAL FLOODWAY CROSS SECTION

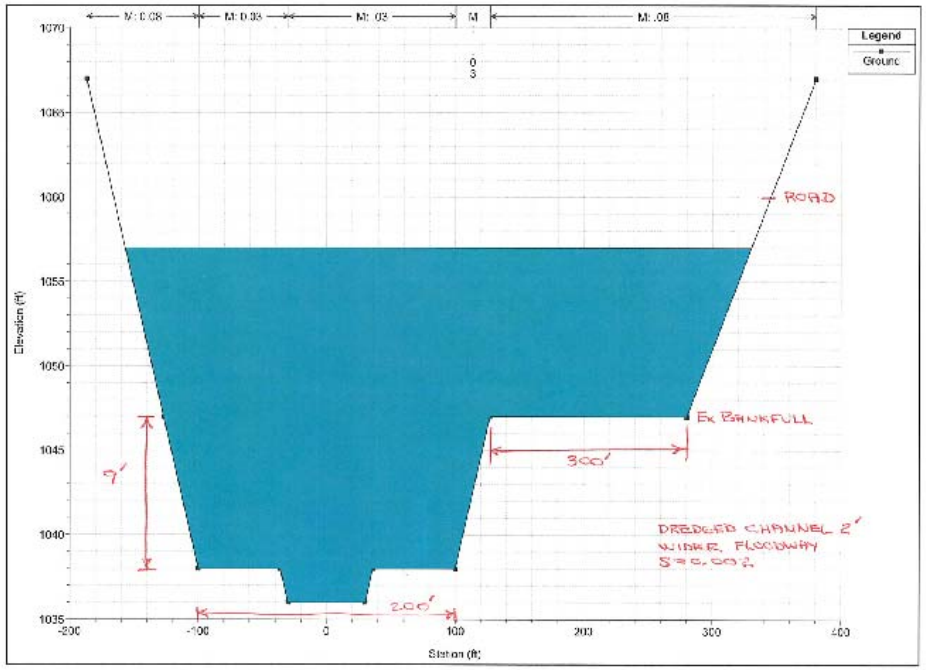
NOT TO SCALE

Effect of Smoothening and Cut



P1

Effect of Dredging and Slope



P2

Preliminary Conclusions

- Increasing Peak Flow Rates
- Channel Slightly Incised
- Rare Events Overtop Developed Terrace
- Significant Energy Loss At Bridge
- Low Gradient Channel at Hunterfield Creek Bar
- Dredging & Widening Floodway Help
- Filling Terrace will Raise Flood Levels