

Village of Mamaroneck Flood Mitigation Status Report





Introduction

- **Flooding is a regional problem that must be addressed with regional solutions;**
- **There are no “quick-fix” answers;**
- **This is an ongoing process;**
- **Geography, History and Technical Explanations;**
- **Response to flooding since April 2007; and**
- **Where We are Today**

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Geography

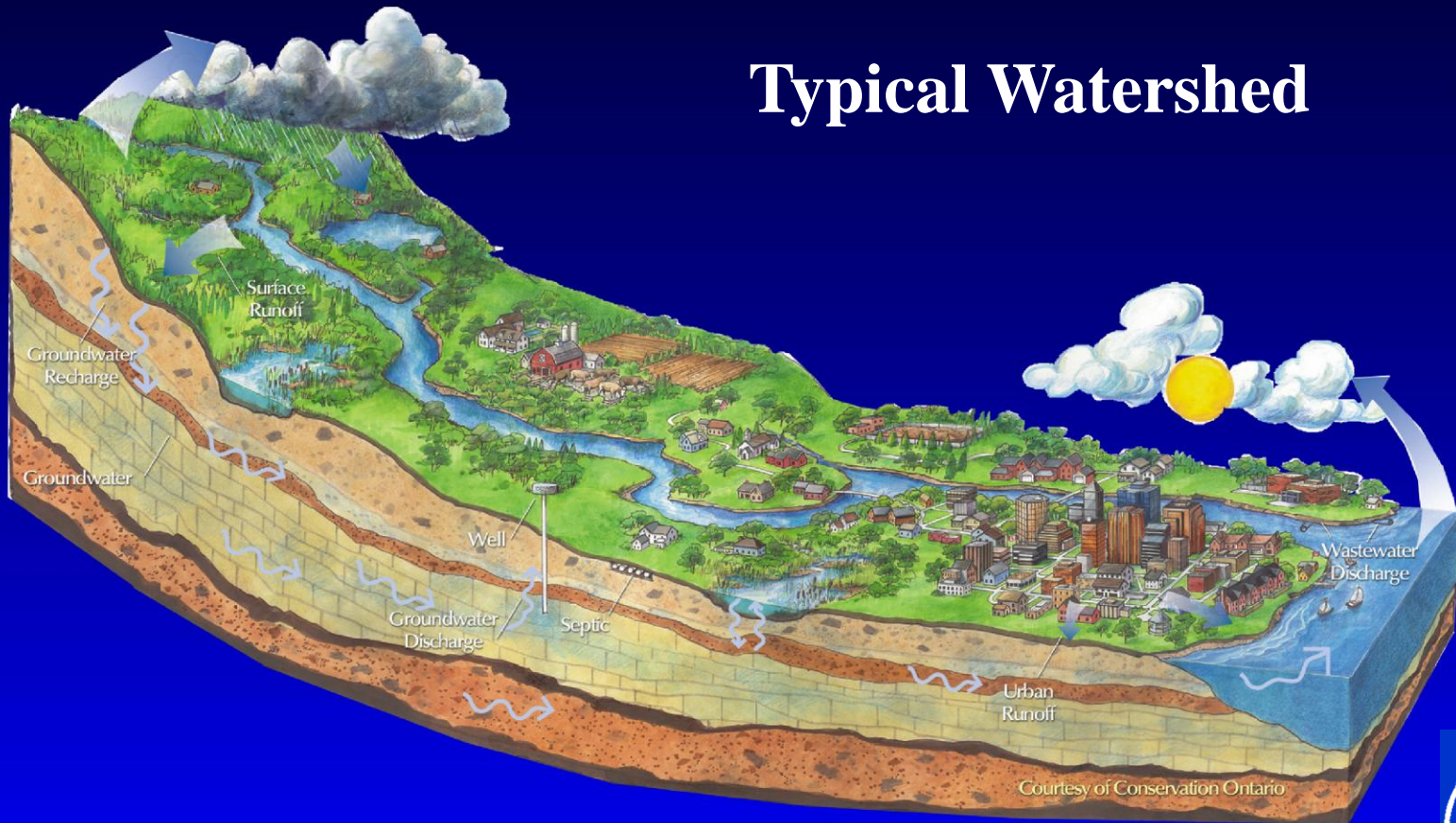
- **What is a Watershed?**
 - **An extent of land where water from rain or snow melt drains downhill into a body of water, such as a river, lake, dam, estuary, wetland, sea or ocean. The watershed includes both the streams and rivers that convey the water as well as the land surfaces from which water drains into those channels; and**
 - **Watersheds can contain multiple “Drainage Basins” or Sub-Basins.**

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Geography

Typical Watershed

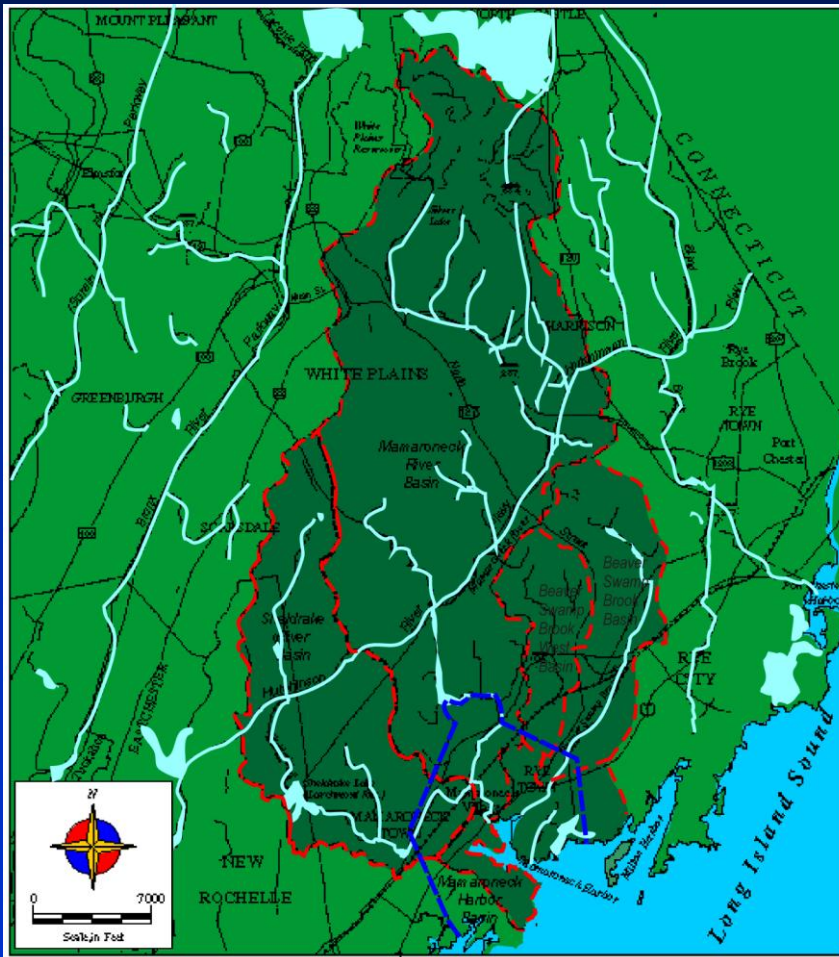


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Mamaroneck Watersheds



- Approximately 32 Square Miles (20,480 Acres)
- 5 Drainage Sub-basins (Mamaroneck River, Sheldrake River, Mamaroneck Harbor, Beaver Swamp Brook and Beaver Swamp Brook West)

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Mamaroneck Watersheds

- **Mamaroneck River**

- **Mamaroneck, Sheldrake and Lower Mamaroneck Harbor Sub-Basins**
- **24 Square Miles (15 above the Confluence of the Mamaroneck and Sheldrake Rivers)**

- **Guion Creek**

- **Beaver Swamp Brook, Beaver Swamp Brook West and Upper Mamaroneck Harbor Sub Basins**
- **8 Square Miles**

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Mamaroneck Watersheds

Storm flows in the Mamaroneck River from the Watershed based on storm size

Storm	Statistical Chance of Occurrence	Runoff in Cubic Feet per Second (cfs)	Runoff in Gallons per Minute (gpm)
2-yr	50%	1,360	610,410
10-yr	10%	2,900	1,301,610
50-yr	2%	4,200	1,885,091
100-yr	1%	4,800	2,154,390

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Floodplain

- **Floodplain**

- **Flat or nearly flat land adjacent to a stream or river that experiences occasional or periodic flooding.**

Includes:

- *Floodway*

- Consists of the stream channel and adjacent areas that carry flood flows

- *Flood Fringe*

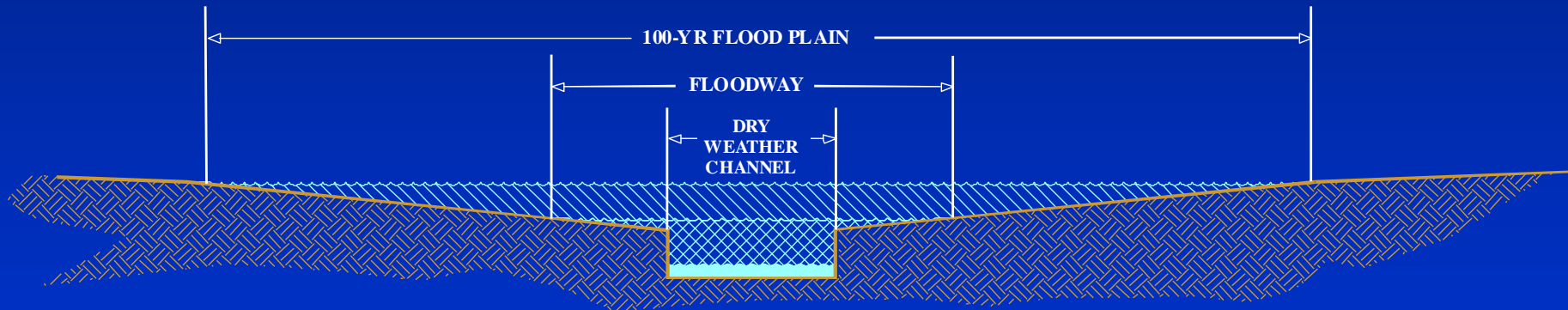
- Areas covered by the flood, but which do not experience a strong current.

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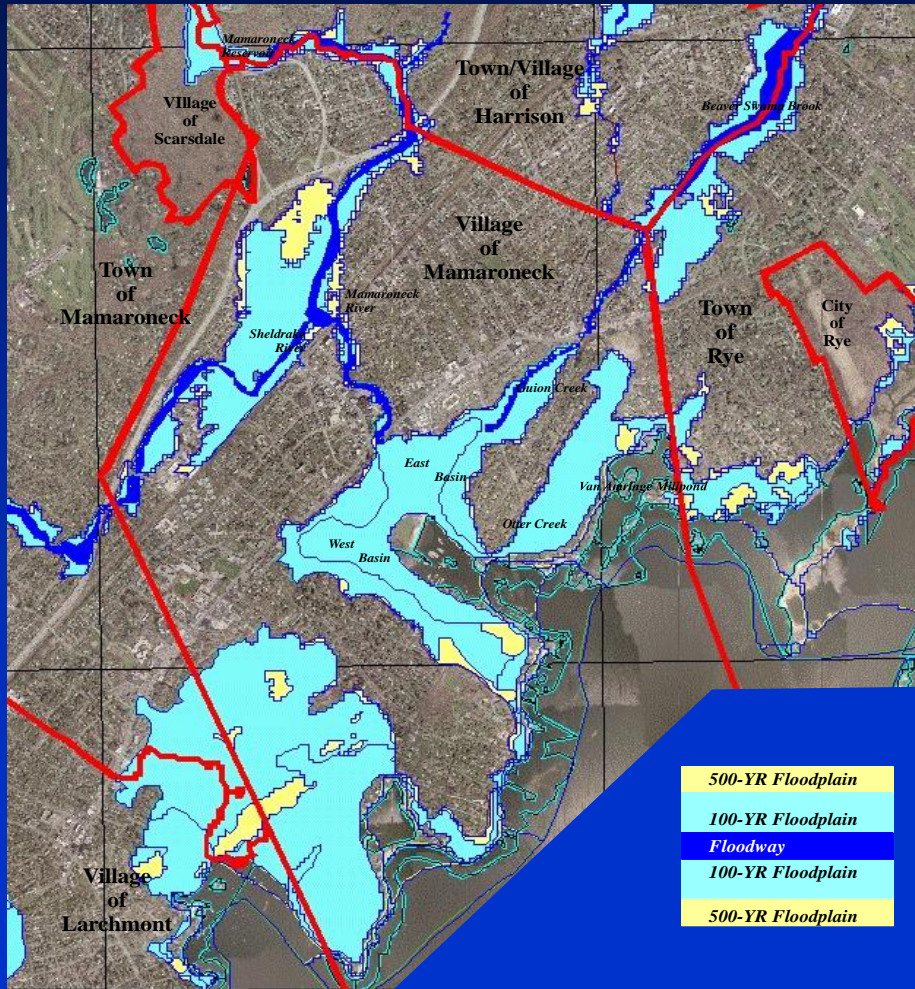
Floodplain

- A River is the *entire* floodplain – not just the dry weather channel



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Floodplain



- *Much of the Village is in the 100-Year Floodplain*
- *Of those areas, many structures predate the current FEMA Construction Guidelines*
- *Many areas and structures actually in the Floodway*

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History

- **Flooding is not new to Mamaroneck**
 - **Records prior to Federal Government Tracking**
 - *From October 1877 to May 1968 informal records indicate 81 Flood events in the Village*
 - **Federal Records since 1971**
 - *Records indicate Significant Floods in 1971, 1972, 1974, 1975, 1978, 1980, 1982, 1984, 1989, 1992, 1996, 1998, 2006, and 2007*
 - *Of these, six were serious enough to warrant Presidential Disaster Declarations, including the most recent in 2006 and 2007.*

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History

■ Flood Control Projects

- 1933 Village Project channelized portions of the Mamaroneck and Sheldrake River floodplains
- 1937 WPA Project improved the Mamaroneck River Channel for 2,300 feet below the North Barry Avenue Bridge to a 30-ft wide rock lined channel

■ Flood Control Studies

- 1942 US Department of War New York District Engineer's Office (predecessor of the Army Corps of Engineers) Flood Control Survey

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History

- **Flood Control Studies (cont)**
 - **1945 Westchester County Harding Report**
 - *Studied Three Alternative Approaches on the Mamaroneck River*
 - Channel Improvement alone
 - Relief Tunnel (from North Barry to Tompkins Avenue) combined with Channel Improvement
 - Flood Control Reservoir combined with Channel Improvement
 - *Also Studied Alternative Approaches on the Sheldrake River*
 - Included Storage at Larchmont Reservoir and various channel improvements and or diversion tunnels.

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History

- **Flood Control Studies (cont)**
 - **The Army Corps of Engineers (USACE)**
 - *1977 USACE Started the Mamaroneck & Sheldrake Rivers Flood Mitigation Studies*
 - *1987 USACE presented findings and preliminary design for a \$60 Million Flood Control Project to widen and deepen the Mamaroneck River and reroute the Sheldrake River under Fenimore Road (project never built because cost benefit ratio did not meet federal criteria)*
 - *Currently completed with Reconnaissance Phase of a Re-Evaluation Study to update this Project. Next Phase (Preliminary Design) slated to be completed in two (2) years.*

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History

- **Flood Control Studies (cont)**
 - **Leonard Jackson Associates**
 - *1982 Study with recommendations for improvements to the Lower Mamaroneck River (was abandoned as a condition of the continuation of the USACE Study)*
 - *2007 Study to evaluate potential structural flood mitigation measures approved by the Board of Trustees in August of 2007*
 - *Simultaneous LJA Study of the Beaver Swamp Brook for Harrison also has potential benefits for Mamaroneck*

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History

- **Spring 2007 Flood Events**

- **March 2, 2007**

- *4-inches of rain in about 4 hours equated to between a 25-yr and a 50-yr rainfall event*
 - *Addition of frozen ground (no infiltration) and snowmelt from previous weeks' snow storms made the actual flood event frequency closer to a 100-yr to 150-yr flood event*

- **April 16, 2007**

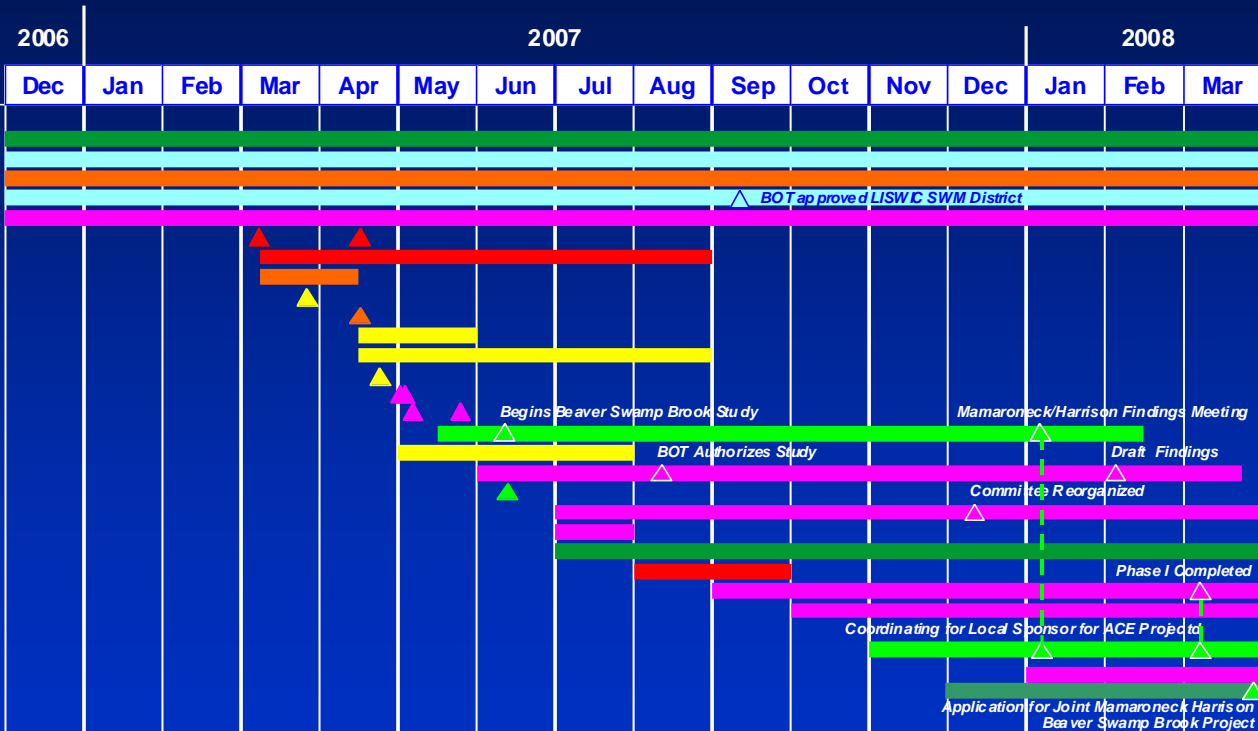
- *Actual measured rainfall of 8.05 Inches in 24-hours equated to a 200-yr rainfall event*
 - *Flood events were close to the long duration rainfall magnitudes*

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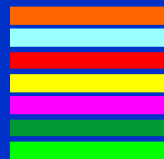


Village Response

FEMA Hazard Mitigation Grant
 The Parkway Drainage Project
 NIMS Federal Mandate for Disaster Preparedness
 LISWIC formation of Regional Stormwater District
 GIS Project
 Flood Events (3/2 - 4/16)
 Storm Cleanup Efforts
 Post-March Village Flood Meetings (Command Center Created)
 Meeting with ACE, DEC, SEMO and Others (3/29)
 Activated Command Center (4/13)
 Coordination of Recovery Efforts with Utilities, etc.
 FEMA Data Gathering by Village Staff
 Waiving of Building Permit Fees for Flood Victims (4/24)
 ACE Tours Village (5/2) Federal Disaster Declared (5/3)
 Community Meetings (5/7 - 5/21)
 Harrison enlists LJA to study Flood issues in Harrison
 Town and Village Committee awards donated relief funds
 Village enlists LJA to study potential structural solutions
 County Summit to explore regional solutions and funding
 Citizens Flood Committee
 Village Flood Control Legislation
 Congresswoman Lowey secures \$30 Million in Federal Funds
 Village begins replacement of capital purchases lost to floods
 Village FEMA Grant Applications
 ACE Mamaroneck Revaluation Study
 Building Department reorganized, strict FEMA enforcement
 New Mayor begins to coordinate Regional Efforts
 Village Attorney Code review and updates (priority on Flood related matters)
 County \$10 Million Flood Mitigation grant Program



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Where are We Now?

■ Flood Control Studies

■ Leonard Jackson Associates

■ *2007 Study Findings Summary*

- Mamaroneck Reservoir as a Retainage Basin – ineffective
- Eliminate Bends in the River – ineffective
- Stream Maintenance – good for low flow situations but negligible effect on flood events
- Widening of Mamaroneck River from Halstead to Ward Avenue – significant effects (up to 3 ft reductions) for flood events

■ *Needs to be put on Hold as a condition of continuation of the USACE Re-Evaluation Study*

■ *Can proceed with work on Beaver Swamp Book without affecting the USACE Study*

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Where are We Now?

- **Flood Control Studies (cont)**
 - **US Army Corps of Engineers**
 - *2007 Re-Evaluation Study*
 - Reconnaissance Phase Completed
 - Needs Local Sponsor (NYS DEC) to continue with process
 - Preliminary Design scheduled for completion in two (2) years
 - Update will not include underground re-routing of Fenimore Road, will need to find alternative method to address these flows.
 - Cannot proceed with any projects that will change the flow profiles or hydraulics of either the Mamaroneck and/or Sheldrake Rivers without risking loss of Federal Funding for Project

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Where are We Now?

■ **Flood Mitigation Advisory Committee**

- **Formed subsequent to the Spring 2007 flooding**
- **Consists of individuals from throughout the Village, reflecting both residential and commercial interests**
- **Coordinates efforts with the Village to address flood mitigation and reduce flood impact both short and long term :**
 - Meet on a monthly basis
 - Advocate for the maintenance of the local infrastructure and propose revisions to the Local Village Ordinances
 - Attend meetings held by neighboring communities to obtain updates on flood mitigation efforts
 - Continue close coordination with the Village with ideas about flood mitigation efforts, the recent flood study conducted by LJA, and the pursuit of all applicable grants

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Where are We Now?

■ Common Misconceptions

■ “Use the Mamaroneck Reservoir as a Detention Basin”

- *For the 100-yr storm the Flow Rate is 2,154,390 gpm, so to retain the storm for one (1) hour you need 129,263,400 gallons of storage, which is 17,281,203 cubic feet of storage. At approximately 7 Acres in size, the Reservoir would need to be about 57 feet deep to provide 1-hour of retention for the 100-yr storm.*
- *Similarly it would require a full 16 ft of depth to retain the 2-yr storm for a single hour.*

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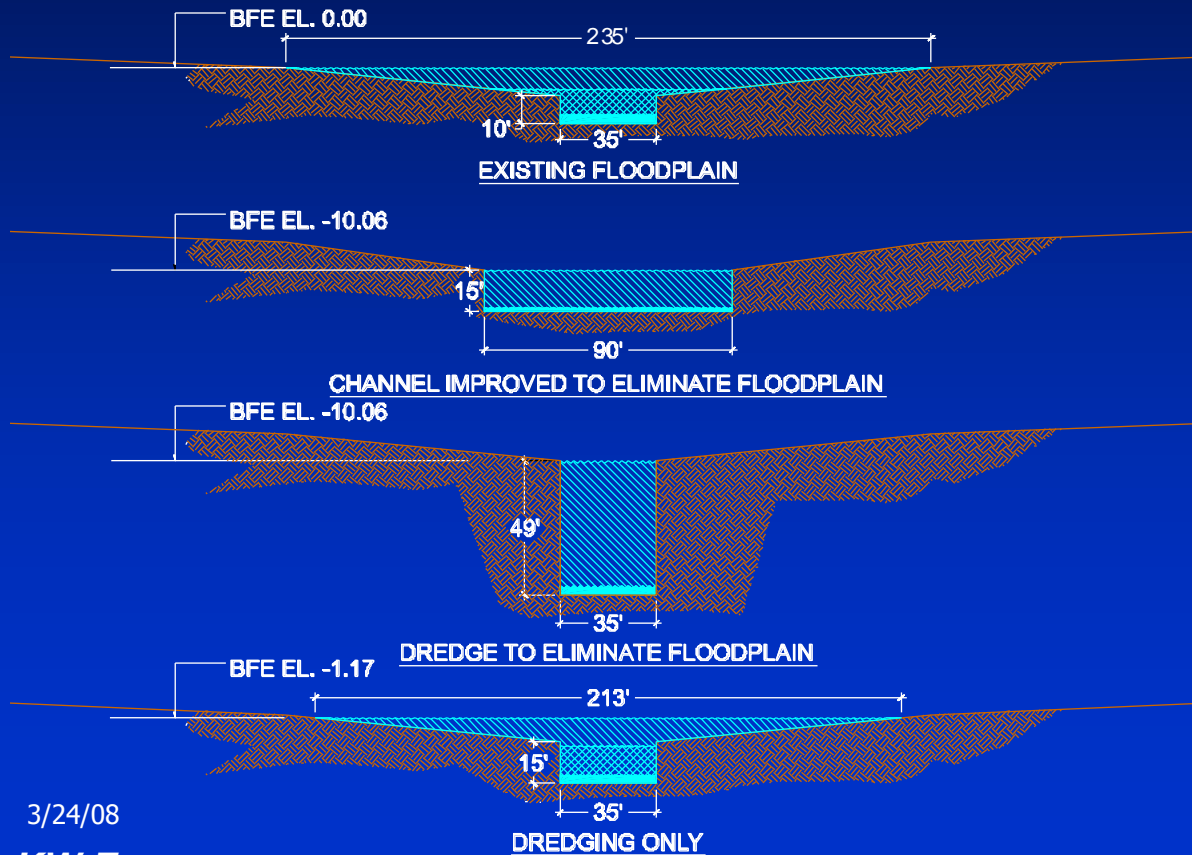


Where are We Now?

■ Common Misconceptions (cont)

■ “Dredge the Rivers”

Dredging alone does not significantly change the Floodplain Elevation, River Channels must be widened and deepened to have any significant impact on the size and depth of the Floodplain



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Where are We Now?

■ Common Misconceptions (cont)

■ Raising Bridges

- *Has no effect whatsoever on the floodplain, bridges need to have their open spans (abutment to abutment) widened as part of overall channel improvements*

■ Re-route the Sheldrake River Under Fenimore Road

- *Part of the original 1986 USACE Project would not pass today's environmental review standards*

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Where are We Now?

- **Stormwater Infrastructure Maintenance**
 - Stormdrains
 - Dam
 - Debris at Bridges

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Where are We Now?

■ Next Steps

- Flood Mitigation Plan
- USACE Reevaluation Study
 - *Securing Local Sponsorship*
 - *No further action on Mamaroneck or Sheldrake Rivers or Risk losing Funding*
- Village Codes Review and Updating
- Other Considerations
 - *Incentives to bring properties into FEMA/NFIP Compliance*
 - *Incentives to manage Stormwater onsite for new or existing sites*

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Summary

- **There is no “Quick Fix” to the Flooding Issue**
 - **About a third of the Village is in the Floodplain, flooding has historically hit the Village hard**
 - **Village has been active in Recovery and Planning for future since the floods of last year**
 - **Village is actively seeking to be part of Regional Stormwater Solutions including the USACE Reevaluation Study**
 - **Will continue to pursue other available (and approved) incremental flood mitigation projects while the Re-Evaluation Study Progresses**

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