Establish objectives

DuPage County
Countywide Stormwater And Flood Plain Ordinance
Original: 1991

Regulatory Mechanism
The 1989 Plan identifies 6 objectives:

1. Reduce the existing potential for stormwater damage to public health, safety, life, and property.

2. Control future increases in stormwater damage within DuPage County and in areas of adjacent counties affected by DuPage County drainage.

3. Protect and enhance the quality, quantity and availability of surface and groundwater resources.
The 1989 Plan identifies 6 objectives (cont’d):

4. Preserve and enhance existing aquatic and riparian environments and encourage restoration of degraded areas.

5. Control sediment and erosion in and from drainageways, developments and construction sites.

6. Promote equitable, acceptable and legal measures for stormwater management.
DuPage County Methodology for Watershed Plan Development

Continuous simulation and dynamic routing models.

Why?
- Account for non-uniform precipitation distribution over the watershed.
- Capture the effects of antecedent moisture on runoff volumes and peaks.
- Difficult to do the above using the design storm approach.
- Model the effects of backwater, flood plain storage and complex urban stream systems.
DuPage County Methodology for Watershed Plan Development

HSPF
- hydrologic analysis
- output is a continuous time series file of runoff for each land cover type and each rain gage.
- 157 events (1949-2008)

USGS Gages
- calibration

FEQ
- hydraulic analysis

DEC-2
- calculate flood damages
West Branch Watershed Location

West Branch DuPage River Watershed Analysis
West Branch Watershed Characteristics

- Total Watershed Area To Fawell Dam is Approximately 100 Square Miles.
- Total Reach Length To Fawell Dam is Approximately 24 Miles
- 10 Tributaries Contribute Flow To The Study Area:
  - Klein Creek
  - Winfield Creek
  - Kress Creek
  - Ferry Creek
  - Spring Brook #1
  - Tributaries #1-5
- 14 Communities & Unincorporated DuPage Contribute Runoff To The Study Area.

West Branch DuPage River Watershed Analysis
**Study Limits**

- **Study Limit**: Roosevelt Road to Upstream of Fawell Dam
- **Total Reach Length**: 7.0 Miles
- **8 Major Bridge Crossings**:
  - Gary Mills Road
  - Mack Road
  - Williams Road
  - Butterfield Road
  - Warrenville Road
  - Ferry Road
  - I-88 Tollway
  - Diehl Road
- **Base Flow Rate**: Approximately 75 CFS
- **Flow Rates At Roosevelt Road**:
  - 10-Yr: 2,400 CFS
  - 50-Yr: 2,700 CFS
  - 100-Yr: 3,550 CFS
- **Flow Rates Upstream Of Fawell Dam**:
  - 10-Yr: 2,900 CFS
  - 50-Yr: 4,100 CFS
  - 100-Yr: 4,600 CFS

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**West Branch DuPage River Watershed Analysis**
Reach 1
Fawell Dam to Ferry Road

Flood Damage Areas
1A – Ferry Road Near River Road

Flood Impacts
1A – Ferry Road Closure

West Branch DuPage River Watershed Analysis
Reach 2
Ferry Road to Warrenville Road

Flood Damage Areas
2A – Bower Elementary
2B – Forest View Drive
2C – Rogers Avenue
2D – Immediately Downstream of Warrenville Road

Flood Impacts
2A – Berm Overtopping/Flap Gate Failures
   • 4 Properties With Structural Flooding
   • Impact to the Public School System

2B – Sandbagging To Prevent Overtopping
   • 35 Flood Risk Properties

2C – Sandbagging To Prevent Overtopping
   • 3 Properties With Structural Flooding
   • 35 Flood Risk Properties

2D – Structural Flooding Area
   • 3 Properties With Structural Flooding

General Reach Flooding
   • River Road Closure
   • Approximately 10 Properties Cutoff from Emergency Access
   • Flood Damages Caused by Groundwater

West Branch DuPage River Watershed Analysis
Reach 3
Warrenville Road to Butterfield Road

Flood Damage Areas
3A – Warrenville Road Area
3B – 2nd Street Corridor
3C – Main Street & Batavia Road
3D – Riverview Drive

Flood Impacts
3A – Restrictive Bridge Crossing
   • 3 Properties with Structural Flooding
   • Warrenville Road Closure
   • Approximately 1.0’ increase in Water Surface Elevations

3B – Structural Flooding Area
   • 7 Properties with Structural Flooding

3C – Structural Flooding Area
   • 5 Properties with Structural Flooding

3D – Structural Flooding Area
   • 5 Properties with Structural Flooding
   • Riverview Drive Closure
   • Approximately 5 Properties Cutoff from Emergency Access

West Branch DuPage River Watershed Analysis
Reach 3
September 2008 Pictures

West Branch DuPage River Watershed Analysis
Reach 4
Butterfield Road to Mack Road

Flood Damage Areas
4A – Butterfield Road Bridge
4B – Williams Road Bridge
4C – Emerald Green Area
4D – Iroquois Court
4E – Forestview Drive

Flood Impacts
4A – Butterfield Road Closure
4B – Restrictive Bridge Crossing
- 2 Properties with Structural Flooding
- Williams Road Closure
- Approximately 0.3’ increase in Water Surface Elevations for Extreme Events & 0.7’ for More Frequent Flood Events
4C – High Flood Risk Area
- Water Surface Elevations Within 2.0” of First Floor Entry
- 10 Multifamily Structures at Risk of Flooding
4D – Structural Flooding Area
- 15 Properties with Structural Flooding
- Approximately 20 Properties Cutoff from Emergency Access
4E – Structural Flooding Area
- 9 Properties with Structural Flooding
- Approximately 17 Properties Cutoff from Emergency Access

West Branch DuPage River Watershed Analysis
Reach 4
September 2008 Pictures

West Branch DuPage River Watershed Analysis
Reach 5
Roosevelt Road to Mack Road

Flood Damage Areas
5A – Mack Road

Flood Impacts
5A – Mack Road Overtopping
- Mack Road Closure
- 1 Property with Structural Flooding

West Branch DuPage River Watershed Analysis
Reach 5
September 2008 Pictures

West Branch DuPage River Watershed Analysis
Summary of Flood Damages

- **Roadway Closings**
  - Five bridges closed during the 2008 storm event
  - Three mile stretch between open bridges
  - Two local roads closed

- **Structural Flood Damages**
  - 47 Residential Structures
  - 6 Commercial Structures
Alternatives

Alternative 1:
No Action

Alternative 2:
Buyouts/Flood Proofing
- Purchase Flood Prone Properties
- Acquire Drainage Easements
- Flood Proof Existing Structures

Alternative 3:
Storage
- Upstream Storage Reservoir

Alternative 4:
Conveyance/Flood Protection
- Warrenville Road Bridge Reconstruction
- Williams Road Bridge Reconstruction
- River Road Improvements
- Bower Elementary Berm Modifications
- Miscellaneous Berm Protection Projects
- Residual Buyouts/Flood Proofing

Alternative 5:
Conveyance/Flood Protection with Water Quality & River Restoration
- Alternative 4 Options
- Channel & Overbank Geometry Improvements
- Streambank Stabilization Improvements
- Riparian Enhancement
  - Wildlife Habitat Enhancement
  - Educational Opportunities
  - Passive Recreation Opportunities
- Residual Buyouts/Flood Proofing

West Branch DuPage River Watershed Analysis
Alternative 5
(Conveyance/Flood Protection With Water Quality and River Restoration)

West Branch DuPage River Watershed Analysis
Recommendation of Alternative 5

- Benefits of Alternative 5 - *Economic Model Results*
  - 93% Reduction in Residential Structural Flood Damages
  - 88% Reduction in Buyout Eligible Residential Structures
  - 94% Reduction in Residential Associated Flood Damages
  - 100% Reduction in Commercial Structural Flood Damage

- Provides Unique Opportunity For Funding Alternatives
  - Total Cost: $18,335,175
  - Cost Share:
    - DuPage County Stormwater Share - $6,490,000 (35%)
    - City of Warrenville (Williams Road Bridge) - $2,500,000 (14%)
    - DuPage DOT (Warrenville Road Bridge) - $4,000,000 (22%)
    - Public and Private Partnership (Water Quality) - $5,400,000 (29%)
Moving Forward

• **Funding:**
  • End of 2010 Board passed bond issue that allocated 5.5M towards implementation improvements.
  • Cost Sharing Agreements between local agencies
  • Seeking other sources of funding for water quality improvements

• **Final Design Contracts Awarded**

• **Construction Schedule:**
  • Final Design by end of 2011
  • Permits by Summer 2012
  • Begin construction on compensatory storage/overbank cuts by Fall 2012

*West Branch DuPage River Watershed Analysis*
Questions & Comments

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West Branch DuPage River Watershed Analysis