2020 Annual Conference

CONNECTICUT
Association of Flood Managers

Windsor Locks Stream Flooding & Sedimentation Evaluation Study

Presented by

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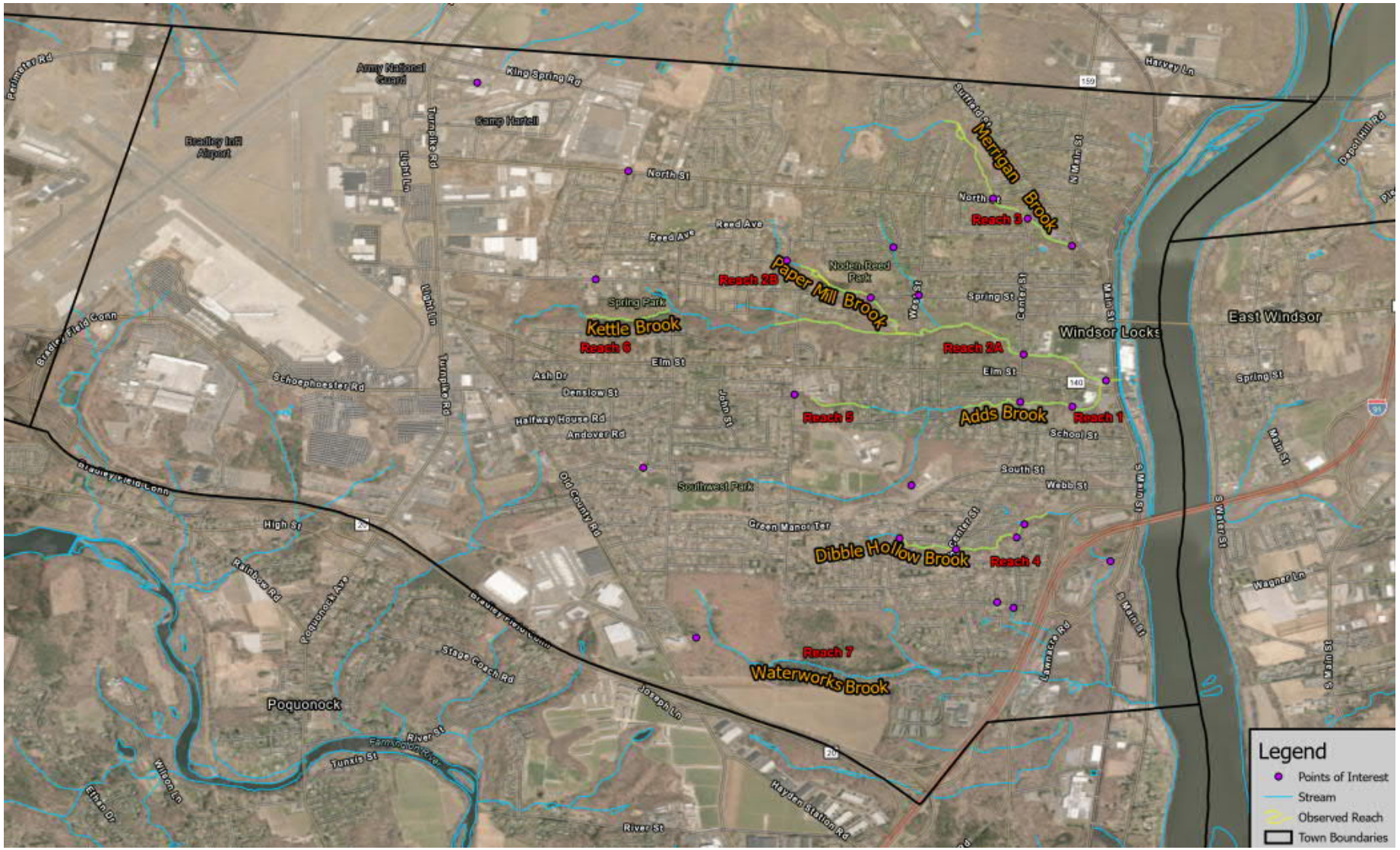
FUSS & O'NEILL

Background

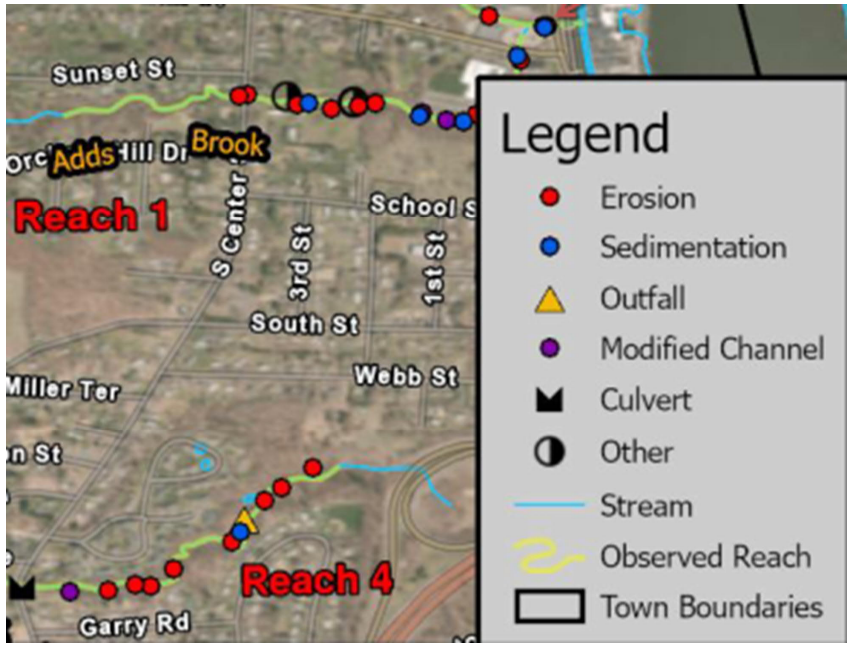
- Windsor Locks has experienced increased flooding & sedimentation in the last 30± years, which is causing issues:
  - Roadway flooding/safety
  - Ongoing maintenance & mitigation costs
  - Impacts to public & private properties
  - Negative visual impacts
  - Canal sedimentation
- As land development & climate changes continue, these issues may get worse

Windsor Locks Streams



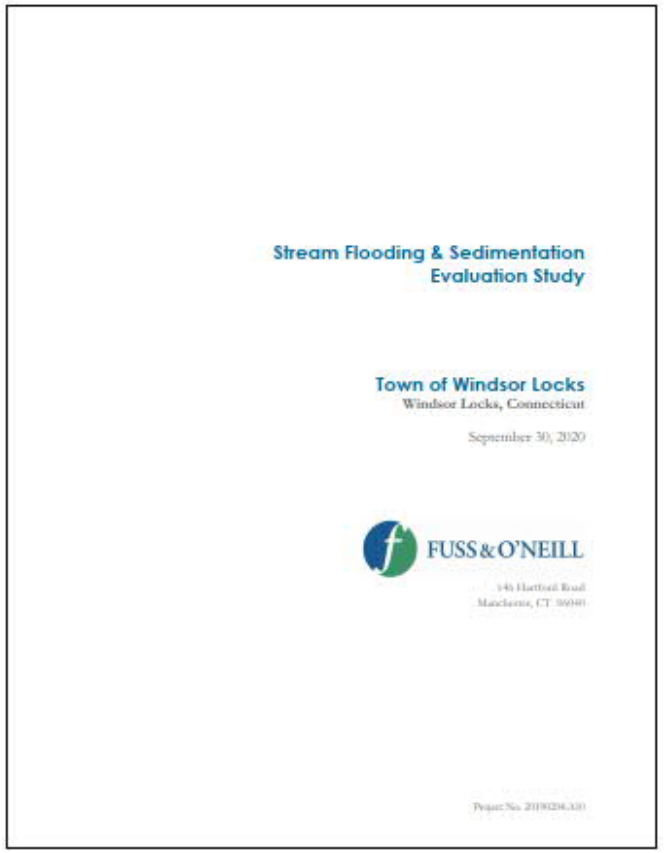
Investigation

- An initial study, preparatory for seeking funding assistance
- Review information provided by Town staff
- Stream walks to document conditions in Adds Brook, Kettle Brook, Paper Mill Brook, Merrigan Brook, Dibble Hollow Brook
  - Erosion
  - Sedimentation
  - Outfalls
  - Modified channels
  - Culverts

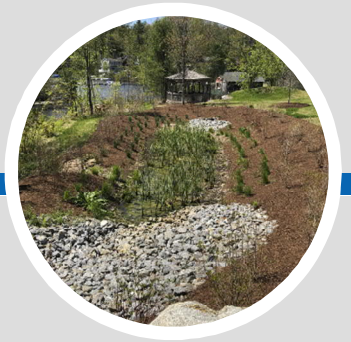


Windsor Locks Stream Study & GIS Map

- Stream Flooding & Sedimentation Evaluation Study
- Interactive GIS map that can help prioritize future repairs at ArcGIS website: https://arcg.is/0C8zDH0





Key Findings

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- Several areas exhibit significant erosion/sedimentation
  - Adds Brook

Key Findings

- Several areas exhibit significant erosion/sedimentation
  - Kettle Brook

Key Findings

- Several areas exhibit significant erosion/sedimentation
  - Paper Mill Brook

Key Findings

- Several areas exhibit significant erosion/sedimentation
  - Merrigan Brook

Key Findings

- Several areas exhibit significant erosion/sedimentation
  - Dibble Hollow Brook

Key Findings

- Windsor Locks soils consist of very fine sand, silt, & clay soils that are susceptible to erosion
- Erosion is exasperated by an increase in runoff from urban development & changes in weather patterns

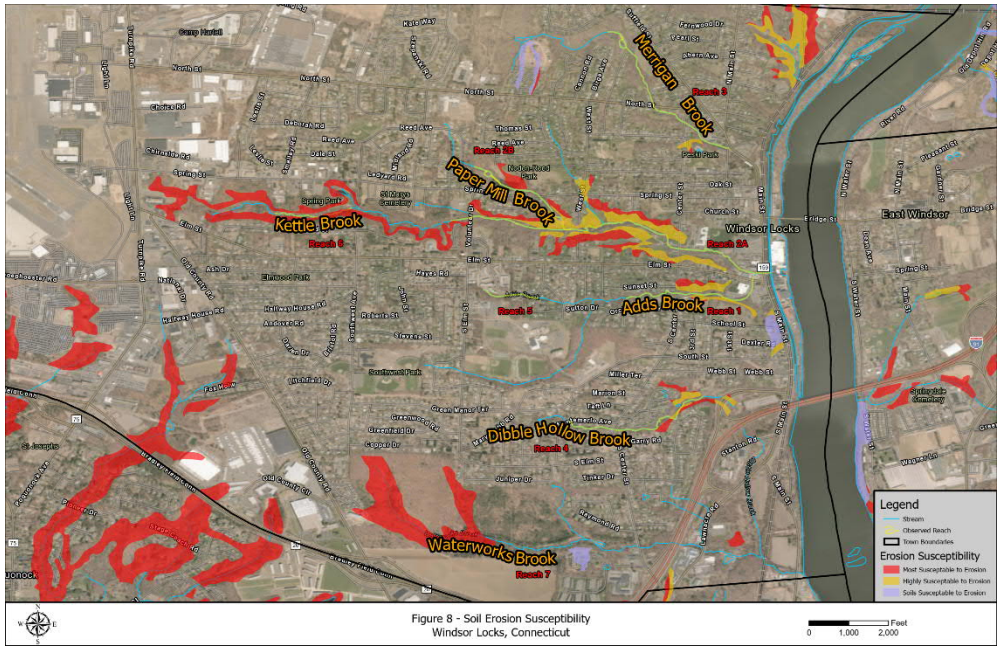
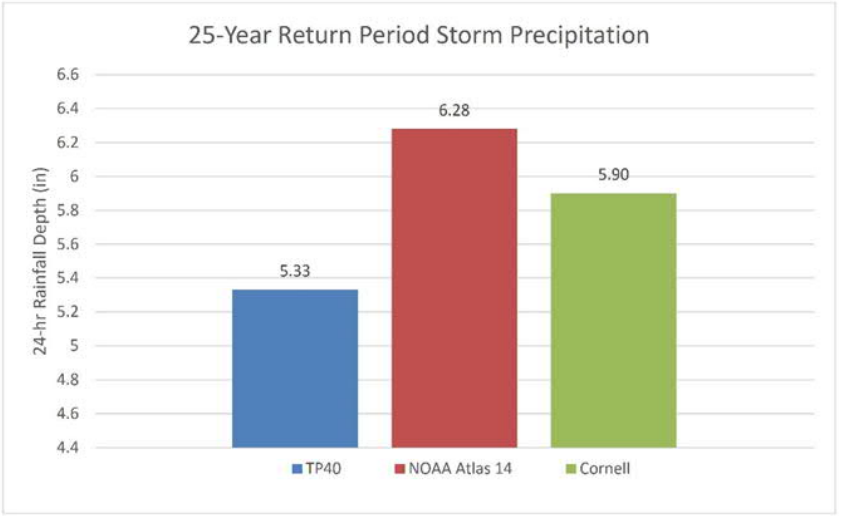


Figure 8 - Soil Erosion Susceptibility
Windsor Locks, Connecticut



Rainfall Depths – Historic & Current Methods

Key Findings

- Adds Brook had the highest number of observed erosion & sedimentation impacts per mile of stream assessed followed by Merrigan Brook
- Kettle Brook, Paper Mill Brook, Dibble Hollow Brook had fewer observed impacts per mile

Brook Name; Reach No.	Miles Assessed/Total	Sedimentation	Modified Channel	Culvert	Outfall	Erosion	Other
Adds Brook; 01, 05	0.81 / 1.15	5	2	0	0	10	3
Kettle Brook; 02A, 06	1.86 / 2.42	5	1	0	2	14	4
Paper Mill Brook; 02B	0.5 / 0.75	0	0	0	0	5	1
Merrigan Brook; 03	1.0 / 1.31	3	0	2	2	10	2
Dibble Hollow Brook; 04	0.86 / 1.56	1	1	2	1	8	0
Waterworks Brook; 07	0 / 1.99	0	0	0	0	1	0

Summary of Impacts in Assessed Stream Reaches

Key Findings

- USDA NRCS Watershed Protection & Flood Prevention Act (PL-566) could fund design/construction of improvements
  - Pros: Can provide 100% design/construction funds (0% local match)
  - Cons: Can take years to obtain NRCS funds
- NRCS performs preliminary investigation to assure a feasible plan can be developed, authorizes federal planning assistance through its State conservationist, develops a watershed plan with Town sponsor, & obtains funding that is dependent on appropriation from Congress.
- Easements, permitting costs may be borne by Town sponsor or NRCS.

NRCS
Natural Resources Conservation Service

Recommendations

Recommendations

- Seek USDA NRCS PL-566 funding assistance for the design & construction of improvements

Applying for Program Assistance

Project sponsors must be entities of state or local government or a tribe. Sponsors submit an application to USDA for assistance. The application must include the following information:

- Size of the watershed.
- Location of the watershed.
- Description of the problems in the watershed.
- Estimate of damages suffered.
- Possible solutions.
- Source of local funds for cost sharing.

The USDA Natural Resources Conservation Service (NRCS) can provide the specific steps and help in submitting the application.

Field Examination

Depending on the problems identified in the application, specialists from NRCS and other federal and state agencies may assist in conducting an analysis of the problems and opportunities of the watershed.

Watershed Planning Assistance

NRCS makes preliminary investigations and confirms the local sponsoring organization's desire to proceed with preparing a watershed plan. The NRCS state conservationist then authorizes federal planning assistance for the watershed. The purpose of this preliminary investigation is to provide reasonable assurance that a feasible plan can be developed.

Developing Your Watershed Plan

NRCS and other federal and state agencies may assist the local organization conduct detailed field studies. These studies further define resource problems to be addressed and estimate the project's costs and benefits.

Using these studies, NRCS and others may assist in the preparation of a watershed plan that would include an environmental assessment. The completed plan would include:

- Resource problems to be addressed;
- Practices to be installed;
- Environmental effects;
- Methods of financing.

Public comment and input is solicited throughout the planning process.

Recommendations

- Prioritize efforts to reduce erosion & sedimentation
- Consider focusing initial soil stabilization efforts along:
  - Dibble Hollow Brook – between Dibble Hollow La. & Bel-Aire Cir.
  - Adds Brook – downstream of South Elm St. & of South Center St.
  - Kettle Brook – at Center St., below Volunteer Dr., in Spring Park
  - Merrigan Brook – between Cannon Pond & end of Dickerman Ave.

Recommendations

- Potential measures to reduce soil erosion & sedimentation:
  - Regrade channel side slopes & stabilize with vegetation
  - Utilize coconut/coir fiber roll stabilization on vegetated slopes
  - Use stream pool riffles to reduce velocities
  - Install riprap armoring
  - Widen stream hydraulic section
  - Install sheeting along channel banks
  - Confine high velocity flows within enclosed conduit
  - Remove trees being undermined & in danger of falling

Recommendations

- Prioritize efforts to reduce flooding
- Consider focusing initial efforts to reduce flooding in:
  - Kettle Brook – at Center St.
  - Merrigan Brook – at Main St. & Chestnut St. intersection
  - Adds Brook – at Elm St.
  - Paper Mill Brook – at Ellis St.

Recommendations

- Potential measures to reduce flooding:
  - Replace small culverts with larger culverts
  - Raise road profiles at crossings
  - Install earthen dike/floodwall along banks to contain larger volumes
  - Enlarge brook cross section
  - Relocate driveways, lower roadway shoulders, install high water warning signs or system
  - Clean culverts, remove fallen trees that restrict flow in streams
  - Reduce future runoff by utilizing “green” or “soft” infrastructure

Recommendations

- Select & design site-specific flood, erosion/sedimentation controls (beyond the scope of this report) based on:
  - Contributing watershed area
  - Peak flow velocities
  - Soil characteristics
  - Stream channel configuration
  - Wetland functions/values
  - Environmental/regulatory impacts of potential solutions
  - Surrounding land use
  - Proximity of adjacent properties
  - Budget/funding considerations

Next Steps

Next Steps

- Seek USDA NRCS PL-566 funding assistance
  - Look for program announcement in Spring of 2021
- Prioritize stream improvements based on available funding
- Design site-specific erosion/sedimentation/flood controls
- Obtain permits & easements
- Construct field improvements

Questions?

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