May 30, 2006

Operations Manager
Lower Connecticut River Basin Office
U.S. Army Corps of Engineers, NED
6 Athol-Richmond Road
Royalston, Massachusetts 01368-8900

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Honorable Dan H. Mylott
Mayor of Fitchburg
718 Main Street
Fitchburg, MA 01420

Dear Mayor Mylott:

I conducted the semi-annual inspection of the Fitchburg Local Flood Protection Project on May 13, 2006. I have enclosed a copy of the report for your review.

Due to a chronic lack of maintenance, the project remains in poor condition. The continued buildup of river shoals and excess vegetation has resulted in decreased hydrologic capacity and exacerbation of the flood threat. The possibility of vegetative material pulling loose during high flows and forming a debris dam at one of the many bridge openings compounds the problem.

I strongly encourage all responsible city officials to review our June 2003 hydrologic report. The report identifies several areas where restrictions are particularly acute and need to be addressed in a timely manner. As an example, the section between the Laurel and Cushing Street Bridges is problematical even if optimally maintained. However, this section of the river channel is seriously restricted in its present condition, with roughly one third of its cross-sectional opening blocked by shoals and vegetative cover.

The city needs to establish a vegetative and shoal removal program as soon as possible, starting with the first priority areas identified in the June 2003 report. The work can be scheduled in cycles whereby each segment is done triennially. The program must be supplemented with state and locally approved herbicide treatment; otherwise, subsequent growth will intensify and overwhelm the effort.

Please be aware that given the project's status, the city may no longer qualify for project rehabilitation under Public Law 84-99. Under this law, the Corps may rehabilitate flood control works damaged or destroyed by floods. The law disqualifies projects that are deteriorated as a result of poor maintenance. The Corps is available to meet with you or your representatives to discuss maintenance strategies in more detail and provide authorized technical assistance.

If you would like to discuss these matters with me personally, would like to discuss the report or have any questions or comments, please call me at (978) 318-8252 or (978) 249-2547.

I appreciate the cooperation and candor of Mr. Meunier and Mr. O'Hara during the inspection.

Sincerely,

Joseph P. Faloretti
Operations Manager
Lower Connecticut River Basin

Enclosures

Copy Furnished:

President, City Council
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(E) Electronic copy

FITCHBURG, MASSACHUSETTS - LOCAL PROTECTION PROJECT

SEMI-ANNUAL INSPECTION

18 May 2006

INTRODUCTION

The City of Fitchburg has not performed any maintenance of the project since the last inspection and very little has been accomplished for many years.

The Corps completed a hydrological study of the project reach entitled North Nashua River Channel Rehabilitation Study – Fitchburg Local Protection Project, June 2003 to determine the impact of excess vegetation and shoaling on river elevations. A copy of the Channel Rehabilitation Study was attached to the Spring 2003 inspection report.

The Corps has identified the most flood-prone reaches of the project, which were assigned one of three levels of priority. Excerpts from the North Nashua River Channel Rehabilitation Study – Fitchburg Local Protection Project, June 2003 have been added to this inspection report to emphasize the critical nature of the First-Priority segments of the project. First-priority segments, those most vulnerable to flooding, include the following:

- From the Laurel Street Bridge to the Cushing Street Bridge (including the Railroad Bridge in between - ***The hydrological report revealed that, due to the Railroad Bridge restrictions, this stretch cannot pass the 9000 cubic feet per second (cfs) design flow even if maintained in optimum condition.*** Moreover, this bottleneck is exacerbated by the presence of vegetation and shoaling in the channel. For example, with the 9000 cfs design flood, elevations would rise an additional 0.9 feet. Hence, removal of shoaling and vegetation within this 400-foot reach would substantially reduce flood damages during a design event or prevent flooding for smaller events.

- From the Commercial Street Bridge to a point 100-feet upstream of the Railroad Bridge upstream of the Putnam Street Bridge – ***Bank vegetation would cause the Railroad Bridge to be overtopped by 0.3 feet in a design storm.*** Vegetation removal along this 300-foot reach would reduce flood stage by 0.7 feet, resulting in 0.4 feet of freeboard.

- From the Railroad Bridge downstream of Oak Hill Road Bridge to a point 500 feet upstream of the Oak Hill Road Bridge – ***Vegetation and shoaling upstream of Oak Hill Road Bridge increase flood stage by 1.5 feet resulting in the bridge being overtopped by 0.4 feet in a design storm.*** Vegetation downstream of the bridge reduces freeboard by 0.8 feet to 0.2 feet, so that a design storm would just barely be contained within the channel at this location, and greater events would cause flooding more frequently.

Other sections identified as second and third priority areas include: the reach from the Sawyer Passway Bridge to a point roughly 300 feet downstream of the Water Street Bridge; the reach 200' downstream of the Rollstone bridge to the downstream Railroad Bridge; the stretch between the Water Street and Laurel Street bridges and the reach between the Circle Street and Lower River Street bridges.

The following conditions were noted during the inspection:

Descriptions in parentheses coincide with station and work area designations on General Plans 1, 2 and 3 of North Nashua River Channel Rehabilitation, Fitchburg, Massachusetts Operations and Maintenance Manual, February 1982.

1. **Project start** (Several hundred feet upstream of Oak Hill Road Bridge, near station 580+00) This ***reach is a First Priority flood prone area.***

   Woody vegetation on the riprap slopes and stone gabions should be removed.

2. **From the Railroad Bridge downstream of Oak Hill Road Bridge, to a point 500-feet upstream of the Oak Hill Road Bridge,** ***This is a First Priority flood prone area:*** Upstream of the Oak Hill Road Bridge, the vegetation and channel shoaling will cause the 9,000 cubic feet per second (CFS) flood stage to rise 1.5-feet higher than the case would be for a fully maintained channel (1.1-feet from vegetation plus 0.4-feet from shoaling). This increase in stage creates flooding that will over-top the Oak Hill Road Bridge by 0.4-feet. Downstream of the Oak Hill Road Bridge, the vegetation between the two bridges of this reach is causing 1.0-feet of freeboard to be reduced to 0.2-feet. If the vegetation within this reach and the shoaling upstream of the Oak Hill Road Bridge was removed, flooding would be less likely to occur in the over-bank areas and the Oak Hill Road bridge would just be able to pass the design capacity.

   Left in the current condition, the LPP only passes 8,500 cfs under the Oak Hill Road Bridge. **Within this reach, the Corps recommends that channel vegetation below 499-feet National Geodetic Vertical Datum (NGVD) elevation and shoaling upstream of the Oak Hill Road Bridge be removed.**

   Oak Hill Road Bridge (Approximately 300 feet downstream of station 575+00)

   Looking upstream - Significant vegetation, including small trees, is present on both sides of the channel should be removed. The shoal on the left bank immediately above and under the bridge appears to be expanding and should be removed (see photograph # 1).

   Looking downstream - The shoal on the left bank appears to be expanding. The shoal should be removed. Vegetation covering both banks should be removed (see photograph # 2).

3. **Daniel Street Bridge** (Approximately 300 feet downstream of station 565+00)

   Looking upstream – A shoal is present in the south (left) half of the channel above the old railroad bridge. This shoal should be closely monitored. Small trees are growing in both sides of the channel (see photograph # 3).

   Looking downstream - Both banks are covered with vegetation (see photograph # 4).

   This reach presently has sufficient capacity to pass the design flood of 9000 cubic feet per second (cfs).

4. **Adjacent to the McDonald's Parking Lot** (Work areas "D" and "E" Located on the left bank downstream of Daniel Street Bridge.)

   Vegetation within the banks of the channel along both sides of the river is 10 to 20 feet high.

   This reach presently has sufficient capacity to pass the design flood of 9000 cfs.

5. **Kimball Street Bridge** (Station 550+00)

   Looking upstream – Heavy brush growth is present along both banks. A shoal on the right bank should be closely monitored.

   Looking downstream – Vegetative growth is present on the east (right) bank.

   This reach presently has sufficient capacity to pass the design flood of 9000 cfs.

6. **Upper River Street Bridge** (Work area "F")

   Looking upstream - Trees are growing out of the walls along both sides of the river (see photographs # 5 & 6). Looking downstream - Heavy vegetation is present along both banks (see photographs # 7 & 8).

   This reach presently has sufficient capacity to pass the design flood of 9000 cfs.

7. **Behind The Former Premier Box Company** Located on the right bank. (Station 550+00 to 545+00)

   Vegetation is present on both banks. A conservation group has proposed development of a river walk between the Upper River Street Bridge and the Sheldon Street Bridge.

   This reach presently has sufficient capacity to pass the design flood of 9000 cfs.

8. **Sheldon Street Bridge** (Work area "G")

   Looking upstream - Woody vegetation and shoals are present on both banks (see photograph # 9).

   Looking downstream - Brush, trees, and other undesirable vegetation are present on both banks. A shoal is present on the left bank (see photograph # 10).

   The channel several hundred feet upstream of the Sheldon Street Bridge is at full capacity during a design flood. However, removal of vegetation within this reach **would not** ***provide any significant margin of safety as flows are controlled by the constriction at the bridge.***

9. **Lower River Street Bridge** (Work area "I")

   Looking upstream - Vegetative growth is present along both banks (see photograph # 110.

Lower River Street Bridge (Work area "I") - Continued

Looking downstream - The large shoal on the left bank should be removed. Vegetation should be removed from both banks (see photograph # 12).

The reach downstream of the bridge is a Second Priority flood prone area, primarily due to shoaling.

10. **Circle Street Bridge** (Station 510+00)

Looking upstream - Trees and brush growing in the training walls along both banks should be removed. The shoal on the left side of the channel should be removed (see photograph # 14).

Looking downstream - Shoals on the both sides of the channel and woody vegetation on the shoals should be removed (see photograph # 13).

The reach upstream of the bridge is a second priority flood prone area, primarily due to shoaling.

11. **Upper Rollstone Street Bridge** (Station 505+00)

Looking upstream - Heavy vegetative growth is present along both banks of the river. Trees are growing along the bridge abutment in a shoal area by the left bank. The shoal obstructs the north half of the channel under the bridge.

Looking downstream - The river channel narrows at this point and should be kept completely free of obstructions. The significant growth of trees, brush and other vegetation in the concrete lining along the left side of the channel should be removed.

The reach downstream of Rollstone Bridge is a Third Priority flood prone area, primarily due to excess vegetation.

12. **From the Commercial Street Bridge to a point 100-feet upstream of the Railroad Bridge upstream of the Putnam Street Bridge,** ***This is a First Priority flood prone area:*** Under existing conditions, the Railroad Bridge would be over-topped by the 9,000 cfs event with 0.3-feet of floodwater. Removal of the vegetation from the Commercial Street Bridge to appoint 100-feet upstream of the Railroad Bridge would allow the flood stage to drop 0.7-feet and thus the flow would pass beneath the bridge.

Left in the current condition, the LPP only passes 8,500 cfs under the Railroad Bridge. **The Corps recommends that channel vegetation below 443-feet NGVD be removed downstream of the Putnam Street Bridge and channel vegetation below 446-feet NGVD be removed upstream of the Putnam Street Bridge.**

Putnam Street Bridge (Approximately 300 feet downstream of station 485+00)

Looking upstream – There is heavy growth of trees and vegetation in the training walls along both sides of the river, extending well upstream of the railroad bridge. This is also a narrow stretch of the river and should be kept free and open. The shoals on the north (right) bank approximately 100 yards above the railroad bridge and under the right span of the railroad bridge should be removed.

Putnam Street Bridge (Approximately 300 feet downstream of station 485+00) - Continued

The large shoal in the center of the channel about 200 yards upstream of the railroad bridge should be removed. The large elm growing on a shoal at the center bridge pier and the shoal at the railroad bridge center abutment should be removed.

Looking downstream - All trees, brush and other vegetation have been cut and removed (in conjunction with the new riverfront park) from within the floodwalls and riprap along both sides of the river extending from the Putnam Street Bridge to the just beyond the Cushing Street bridge.

Railroad Bridge (Looking upstream from the Putnam Street Bridge.)
The trees and shrubs growing in the channel in the vicinity of the railroad bridge should be removed.

13. **From the Laurel Street Bridge to the Cushing Street Bridge (including the Railroad Bridge in between),** ***This is a First Priority flood prone area and the most likely reach to experience flooding.*** Survey work performed by the Corps of Engineers in 2001 as part of the North Nashua River Channel Rehabilitation Study – Fitchburg Local Protection Project, May 2003, has shown that this reach is under tighter flow constrictions from the Railroad Bridge and abutments than was assumed in earlier hydrological investigations. The resulting analysis (with the more detailed survey data) shows that the design capacity that was adopted for the rehabilitation (completed in May 1981) was not realized in the vicinity of this Railroad Bridge. ***That is to say that even if the Fitchburg Local Protection Project were perfectly maintained, a 9,000 cubic feet per second (CFS) event would still crest over the Railroad Bridge (previously thought to barely pass the flow) and cause flooding on the left (North) over-bank area of this reach of the North Nashua River (flood crest of approximately 2-feet higher than previously thought).***

Vegetation and shoaling presently in this reach would raise flood levels an additional 0.9' during a 9,000 cfs event. The vegetation and shoaling are roughly equally responsible for this rise, 0.4 and 0.5-feet, respectively. Although a 9,000 cfs event will over-top the Railroad Bridge and the left bank even if the channel is optimally maintained (unless significant new rehabilitation of the area is undertaken), maintenance improvements would significantly reduce flood levels impacting the area.

It should also be noted that under existing conditions, no freeboard exists for the right (South) over-bank area and a minimal amount exists for the Cushing Street Bridge (for the 9,000 cfs flood stage), but removal of the vegetation and shoals would improve that measurement of safety by 0.9-feet.

Left in the current condition, the LPP only passes 6,000 cfs under the Railroad Bridge. **The Corps recommends that channel vegetation below 436-feet National Geodetic Vertical Datum (NGVD) elevation and shoaling be removed from this reach.**

Laurel Street Bridge

Looking upstream - Major shoaling has taken place in the entire area of the upstream railroad crossing. A large shoal, which is nearly covered with vegetation, restricts the western span and half of the center span (see photographs # 15 & 16).

Laurel Street Bridge - Continued

This is a significant restriction, which has decreased the discharge capacity of the channel by nearly 33% and needs to be corrected promptly. The shoals and vegetation should be removed.

The flat area adjacent to the pedestrian safety rail between the Railroad Bridge and the Laurel Street Bridge has recently been cleared providing an excellent access point for removal of the shoals and vegetation.

Looking downstream - The channel narrows downstream of a manhole on the right bank. The trees, brush and vegetation growing along both banks should be removed.

14. **Water Street Bridge** (Station 460+00)

Looking upstream – The large shoal about 100 feet upstream of the bridge along the north (right) bank near the floodwall should be removed. Significant tree growth along the south bank should be removed. Concrete walls line both sides of the river.

Looking downstream - A shoal has formed on the left bank adjacent to the floodwall. Numerous willow trees have become established.

The reach upstream of Water Street Bridge is a Second priority flood prone area, primarily due to excess vegetation.

15. **Sawyer Passway Bridge** (Approximately 75 feet downstream of station 450+00) This bridge is located about 1,000 feet upstream of the Fifth Street Bridge.

Looking upstream - Shoaling in the center of the river above the bridge and has created a restriction within the channel and should be removed. Small trees have fallen over.

Railroad Bridge Upstream - This bridge has 3 arches (spans). The lower portion of the right span is completely blocked by a shoal. The shoal should be removed.

Downstream - There is major brush, tree and vegetative growth on both banks downstream to the Fifth Street Bridge.

The reach upstream of the bridge is a Third Priority flood prone area, primarily due to excess vegetation.

16. **Fifth Street Bridge** (Work area "T")

Looking upstream - The steep slopes near the bridge should be monitored closely to prevent erosion.

Looking downstream - There are trees, brush and vegetative growth within the wide floodway.

This reach presently has sufficient capacity to pass the design flood of 9000 cfs.

17. **Railroad Bridge** Located several hundred feet downstream of Fifth Street Bridge. (Station 420+00)

    The city should inspect this bridge and provide access to the site during the semi-annual inspections.

    This reach presently has sufficient capacity to pass the design flood of 9000 cfs.

18. **Bemis Road Bridge** (Work area "U")

    Riprap at both bridge abutments is free of vegetation.

    Looking upstream - Small trees have become established on the riprap protection and at the toe of the slope along the right bank.

    Looking downstream - The river channel is wide and straight. There is a large shoal in the middle of the channel and another on the north (left) bank about 125 yards downstream.

    This reach presently has sufficient capacity to pass the design flood of 9000 cfs.

19. **Airport Road Bridge** (Formerly Falulah Road) (Work area "W")

    Looking upstream - Brush and trees are present along both banks. There are trees in the channel at the abutments and on the shoal on the left bank (see photographs # 17 & 18).

    Looking downstream - The shoals along the right and left bank have increased in size. The shoal on the right bank extends under the bridge and a short distance upstream of the bridge (see photographs # 19 & 20).

    This reach presently has sufficient capacity to pass the design flood of 9000 cfs.

GENERAL

1. **The hydrological study identifies roughly 5800 linear feet of restricted channel section, which represents about 25% of the total project. The priority areas should be addressed through an aggressive long-term maintenance program.** The Corps stands ready to work with the city in developing a specific plan. The remainder of the project, presently capable of passing the 9000 cfs design flood, should continue to be monitored closely to assure that shoaling and vegetative growth does not progress to the extent that channel capacity is reduced to below the design standard.

   The hydrological study revealed that some vegetation and shoaling along much of the project may be tolerated without compromising design channel capacity. This allows for the adoption of a more balanced approach that addresses the needs of both flood control and environmental resources.

2. **A semi-annual report, due in February and August of each year should be submitted by the city to the Corps** per Section III. GENERAL REGULATIONS, 3-05 Reports, a Inspection and Reports of the Operation and Maintenance Manual for Local Protection Project, Fitchburg, Massachusetts, February 1982. The semi-annual reports should provide an update of the city's progress in accomplishing the necessary maintenance of the project and serves as an important tool in assessing the project status. **Semi-Annual reports have not been submitted by the city for nearly 2 decades.**

GENERAL - Continued

3. The city should obtain all necessary local, state and/or federal permits to accomplish project maintenance. The Department of Public Works must work closely with the Fitchburg Conservation Commission and the Massachusetts Department of Environmental Protection and other interested parties to develop a plan and obtain the necessary local, state and federal permits before beginning any work in the river and channel. This work may include, but is not limited to, brush removal and herbicide treatment, as well as the removal of shoals and other obstructions. The plan should address flood control maintenance along with environmental issues and concerns.

4. Cutting is only a partial solution to the problem of undesirable vegetation. Significant resprouting occurs on an annual basis. Application of an approved herbicide, accomplished in accordance with state laws and regulations, is recommended to prevent trees, shrubs and other vegetation from quickly sprouting.

LOCAL FLOOD PROTECTION PROJECT INSPECTION REPORT

Project: **Fitchburg, Massachusetts**

Maintaining Agency: **City of Fitchburg, Department of Public Works**

Type Inspection: __X__ Semi-Annual Staff _____ 90 Day Interim

River Basin: Lower Connecticut Date of Inspection: **18 May 2006**

Feature	Sat	Unsat	Deficiencies
PUMPING STATIONS - STRUCTURES			**N/A**
INTERIOR			
EXTERIOR			
PUMPS - MOTORS - ENGINES			**N/A**
TRIAL OPERATED			
GENERAL CONDITION			
POWER SOURCE			
INSULATION TESTS			
METAL INTAKES/OUTLETS			
GATE VALVES			
GATES - DRAINAGE STRUCTURES			**N/A**
TRIAL OPERATED			
GENERAL CONDITION			
LUBRICATION			
DIKES - DAMS			**N/A**
GENERAL CONDITION			
SLOPES/EROSION			
SAND BOILS/CAVING			
TRESPASSING			
SLOPE PROTECTION			
DRAINS			
STOP-LOGS - LOG BOOM			**N/A**
CONDITION OF LOGS			
AVAILABILITY OF LOGS			
HIGHWAY SLOTS			
STORAGE FACILITIES			
CHANNELS - OUTLET WORK CHANNEL			
BANKS		X	**See remarks.**
OBSTRUCTION CONTROL		X	**See remarks.**

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Feature	Sat	Unsat	Deficiencies
CONCRETE STRUCTURES			
SURFACE		X	See remarks.
SETTLEMENT		N/A	
JOINTS		N/A	
DRAINS			
MISCELLANEOUS			
EMERGENCY OPERATIONS PLANS			
EMERGENCY EQUIPMENT			
SEMI-ANNUAL REPORT		X	No report submitted.

Inspection Party: Denis Meunier, Fitchburg Commissioner of Public Works
Michael O'Hara, Fitchburg Planning Coordinator's Office
Joseph Faloretti, Operations Manager, LCRB, USACE

Photographs Taken: See attached photographs

Remarks & Additional Comments:
(Indicate here observations, discussions, specific feature deficiencies, recommendations and any other pertinent information. Use continuation sheet if necessary.)

See attached sheets.

X ALL APPLICABLE ITEMS. IF UNSAT INDICATE SPECIFIC DEFICIENCIES. INDICATE IF NOT APPLICABLE.

DATE:	INSPECTED BY: TYPE NAME & TITLE	SIGNATURE
	Joseph P. Faloretti Operations Manager, Lower Connecticut River Basin	