

Buzzards Bay



*National Estuary
Program*

Board of Selectmen
Town Hall
59 Town Hall Square
Falmouth, MA 02540

December 21, 2005

Dear Board of Selectmen:

The Falmouth Department of Public Works has unveiled a preliminary plan to extend the Shining Sea Bikeway 6.2 miles along the old rail line in West and North Falmouth. I wish to call your attention to the fact that the original construction of the rail line, together with repair work after Hurricane Bob in 1991 (several areas of track bed were washed out), and the gradual collapse or filling of culverts with gravel, have restricted tidal exchange and flushing in at least five salt marsh sites along the planned bike path. These tidal restrictions, located principally in the area of great Sippewisset Marsh, have choked off and killed areas of salt marsh and degraded wildlife habitat by allowing the marshes to be overtaken by the common reed, Phragmites, and other nuisance species. Attached are maps (figures 1-2), aerial photographs (figures 3-6), and a table of information about these restrictions contained in our 2002 Atlas of Tidally Restricted Salt Marshes in the Buzzards Bay Watershed. (data in Table 1 from CD version database).

The town's work on the bike path provides an excellent opportunity to restore at least some of these impaired salt marshes at a fraction of the cost to normally restore these sites. Moreover, the town's expenditures for the bike path could be used to match certain grant programs, so this work may be achieved at little or no cost to the town.

State and local wetland permits would be required for this project because the rail line traverses extensive wetland areas. The replacement of undersized culverts under the railroad bed can be included in these plans, so that culvert replacement work will not delay bike path construction. There are long-term benefits of this work because larger culverts can help minimize future storm damage caused by overwash. It also should also be recognized that through the permitting process, the town, in any case, might be required to evaluate the replacement of obstructed or collapsed culverts that have created tidal restrictions. Once the bike path is built, it will be difficult and more expensive to correct these problems.



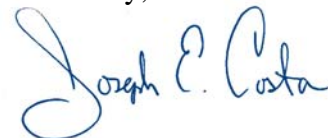
Among the tidal restrictions caused by the rail line, the restriction that appears to warrant the most consideration is the double pipe system identified as FA28 and FA28A, shown in figures 7, 8, and 9. The railway track is at its lowest elevation here, in part because it was built in a salt marsh, and also because the marshland may have subsided somewhat. This area is subject to storm flowage and, as shown in figure 9, the spring tide and storm surge wrack lines are just 1 foot below the top of the tracks. Hurricane Bob washed out the track bed here in 1991 and stone ballast was washed landward creating a stone debris field that remains in the marsh (figure 8). This stone ballast could be removed as part of a salt marsh restoration. The railway bed is narrow here and appears to be eroding. Attempting to stabilize this area for the bike path may require filling in portions of the salt marsh. To avoid additional salt marsh fill, a large box culvert or even an elevated wood bridge could restore tidal flushing of the eastward marsh and solve a difficult bike path crossing through the salt marsh.

It is also worth stressing that some tidal restrictions caused by the bike path should not be restored. The long flooded area west of the tracks in the vicinity of Nonamesset Road near Snug Harbor in West Falmouth should be left as is. The lack of drainage from either poor designs or lack of maintenance long ago created a small freshwater wetland and pond at that site, and these wetlands should be preserved.

Besides the state and local wetlands permits, the construction of the bike path may require filings with MEPA, a Chapter 91 license (part of the line is in filled tidelands and the bike path represents a change in use), an MCZM federal consistency, and possibly even an EPA Phase II NPDES Stormwater Construction Permit. The Buzzards Bay National Estuary Program can provide free technical assistance on the permitting, wetland delineation, or wetlands line review to help expedite the permitting process. In the past we assisted both the towns of Mattapoisett and Fairhaven with permits for their bike path expansions.

In summary, the construction of the bike path represents an excellent opportunity to address long neglected culvert maintenance and drainage issues in tidally restricted salt marshes in Falmouth. If the Buzzards Bay National Estuary Program can be of assistance to the town with this project, please do not hesitate to call me.

Sincerely,



Joseph E. Costa, PhD
Executive Director

cc. Bike Path Committee
Brian Grozier Chairman, Conservation Commission
Gaetano Calise Jr., Falmouth Department of Public Works
Hunt Durey, MCZM, Wetland Restoration Program
Stephen Farr, Vanasse, Hangen, Brustlin Inc., Watertown
Massachusetts Highway Department

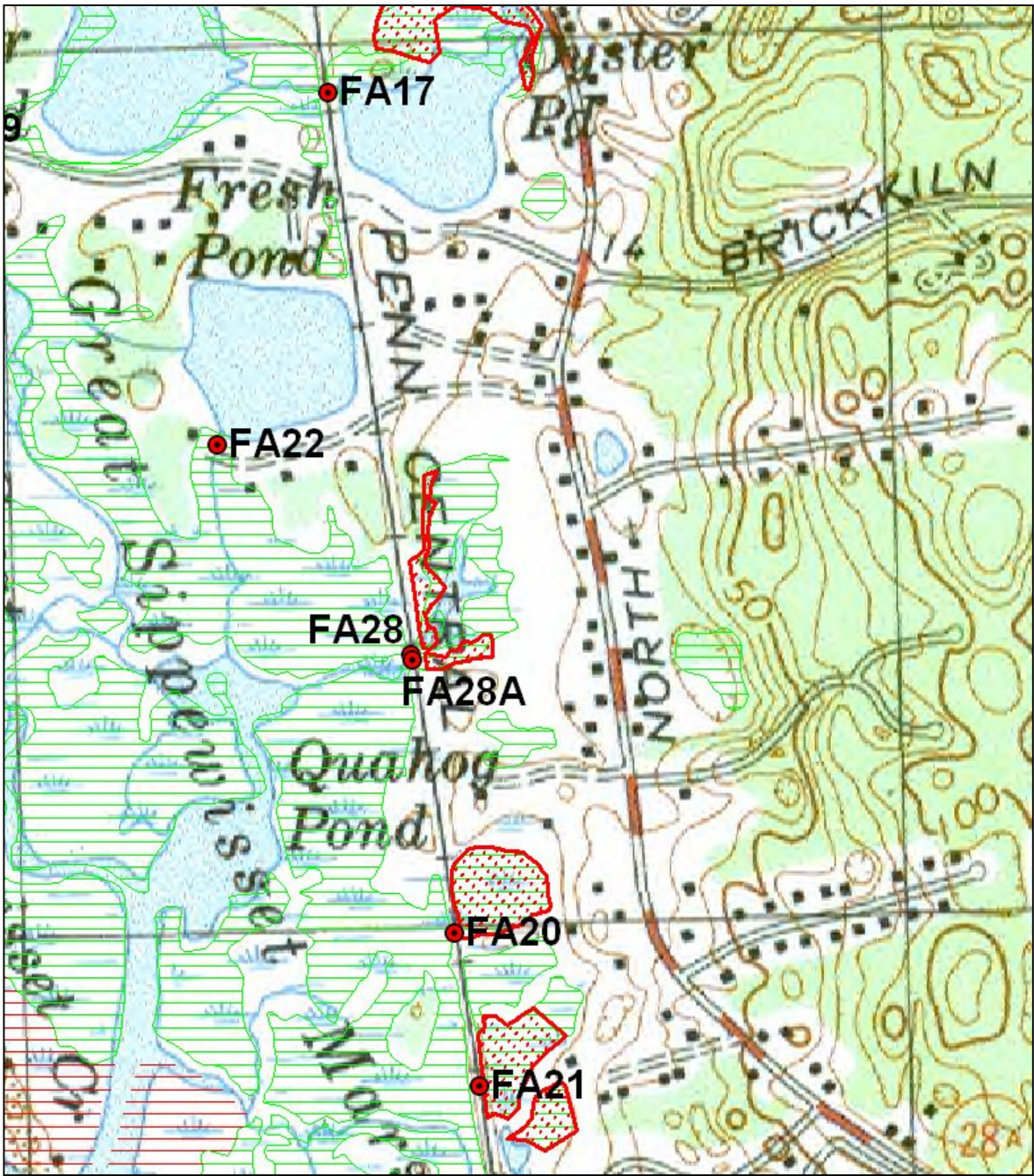


Fig. 1 USGS topographic map showing the tidal restrictions in West Falmouth along the rail line (red circles) with areas of adjoining wetland (principally salt marsh-green hatched areas) and wetlands dominated by Phragmites (red dotted areas).



Fig. 2. A 2001 Orthographic aerial photograph map showing the tidal restrictions in West Falmouth along the rail line (red circles) with areas of adjoining wetland (principally salt marsh-green hatched areas) and wetlands dominated by Phragmites (red dotted areas).



Figure 3. Oblique aerial photograph of Restriction FA17 at Oyster Pond, red outline is approximate area affected by tidal restriction.



Figure 4. Oblique aerial photograph of restriction pipes FA28 and FA28A.



Figure 5. Oblique aerial photographs of Restriction FA20 (left) and FA21 9 (middle) south of Quahog Pond in Great Sippewisset Marsh.

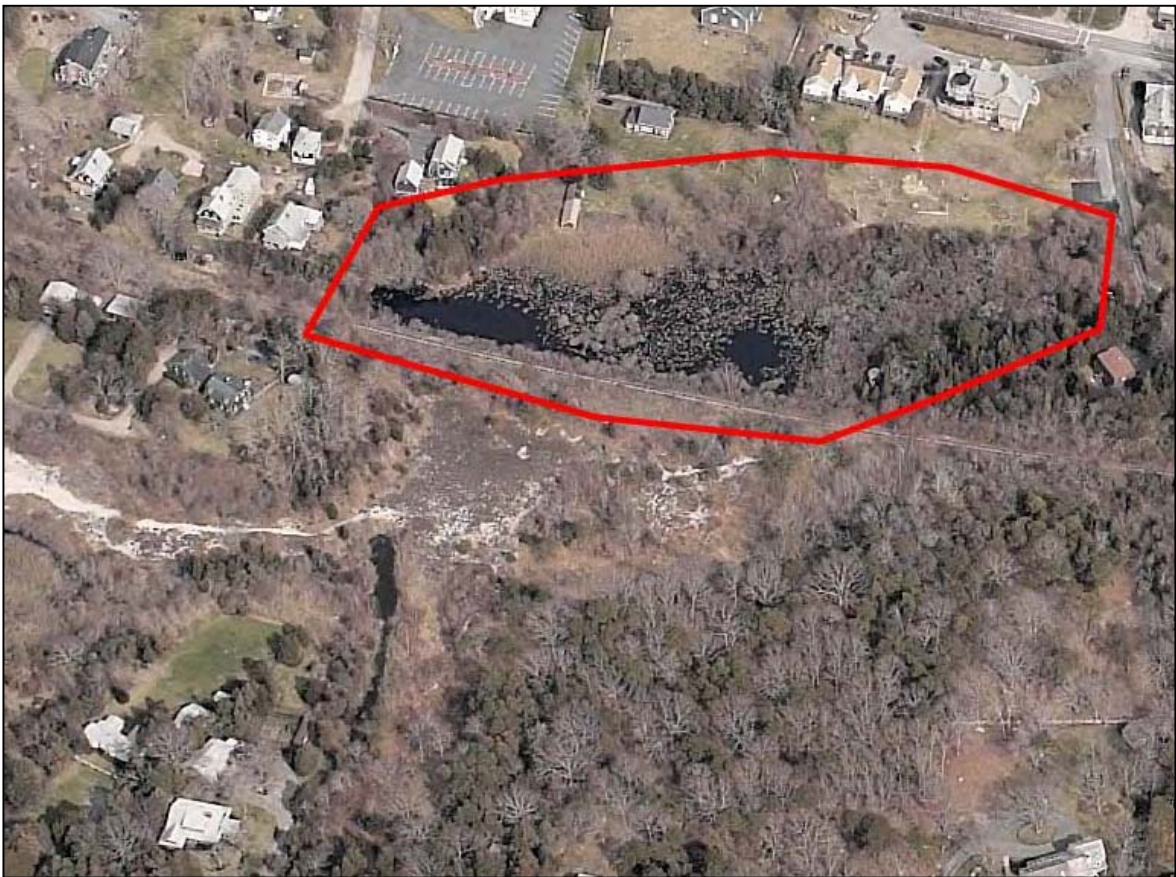


Figure 6. Oblique aerial photograph of an old tidal restriction behind Nonamesset Rd, near Snug Harbor caused by the railroad track construction. This site was not included in the Buzzards Bay NEP tidal restriction atlas because of the extensive fill seaward of the railroad tracks, and because the inland side of the tracks appears to be a well established freshwater wetland.

Table 1. Excerpts from Data Base on the Buzzards Bay Tidally Restricted Salt Marsh Atlas CD (28A revised).

Site #	FA17	FA20	FA21	FA28	FA28A
Town	Falmouth	Falmouth	Falmouth	Falmouth	Falmouth
Restriction Structure Type	culvert	culvert	culvert	dike + culvert	dike + culvert
Remediated?	N	N	N	N	N
Surface water acres behind rest.	6.76	2.19	0.00	1.39	1.39
Vegetated Wetland acres affected	3.78	2.19	2.47	3.82	3.82
Total wetland with surface water	10.54	4.38	2.47	5.21	5.21
Phragmites acres	2.36	2.19	2.47	1.04	1.04
% Phragmites	62.4%	100.0%	100.0%	27.2%	27.2%
Existing Rest. opening width (ft.)	5.0	1.0	1.0	4.0	3.0
Existing restrict. transit length ft.	12	60	60	21.6	21.6
Rest. Opening Cross section(ft ²)	19.63	0.79	0.79	2.00	7.07
Culvert Type	Corr. Metal	stone	stone	stone	metal
No. of existing Culverts	1	1	1	1	2
Culvert Condition	fair	poor		poor	good
Shape	circle	box	box	box	circle
Explain Condition of Culvert	Big pool on upstream side, sandbar in channel			ballast from railroad tracks has filled most of culvert	culvert elevated too high for tidal flow
Additional Comments	ponded water behind it-rock pile in front of culvert opening. Sandbar 25 ft downstream			see other sheets for culverts	see other sheets for box culvert
culv. diam./ box width (in)	60	12	12	48	36
Box culvert height (in)				6	
Culvert cross-section (ft ²)	19.63	0.79	0.79	2.00	7.07
Evidence of Restriction	L,C,P,PU,US,VDB, BE			Phrag	Phrag
Low lying devel. areas?	N				
PlantsUp/Down stream	Sp,Sa/Sp,P			Iva, Phrag/Sp	Iva, Phrag/Sp
Other Plant Species Observed				Toxco.	Toxco.
Wildlife Observed				Osprey	Osprey



Figure 7. Photo of the landward side of the tracks at tidal restrictions FA28A and FA28 in Great Sippewisset Marsh. The old stone box culvert (right) is filled with boulders and track ballast stone. The metal pipe (FA28A left), probably installed after Hurricane Bob damage, was improperly sized and not at the correct elevation. A 400 square foot wetlands fill caused by a debris field of ballast from the Hurricane Bob washout begins to the left in this photo.



Figure 8. Old stone debris field washed into and left in the landward marsh as a result of Hurricane Bob near restrictions FA28A and FA28 in Great Sippewisset Marsh.



Figure 9. Spring high and storm surge wrack lines on the westward face of the tracks at restriction FA 28 and FA28A (pipe just visible center). The railway bed is at its lowest elevation in this location, and appears to be eroding on the seaward face.