

ABBREVIATED NOTICE OF RESOURCE AREA DELINEATION

Bruce Freeman Rail Trail Acton, Carlisle, and Westford, Massachusetts

SUMMARY

On behalf of the respective Towns of Acton, Carlisle, and Westford, Massachusetts, the Horsley Witten Group, Inc. has filed an Abbreviated Notice of Resource Area Delineation to confirm wetland resource areas along the approximately 4.5-mile stretch of the Bruce Freeman Rail Trail from its intersection at Route 225 in Westford, south to approximately the Acton-Concord municipal boundaries. Wetland resource areas encountered include Bordering Vegetated Wetland, inland Bank, Land Under Waterbodies and Waterways, Bordering Land Subject to Flooding, and Riverfront Area associated with two perennial streams, Butter Brook and Nashoba Brook

Wetland resource areas found along this stretch of the rail trail are protected and regulated under Massachusetts Wetlands Protection Act, its implementing Regulations, and/or the Town of Acton Wetland Protection Bylaw and associated Rules and Regulations, the Town of Carlisle Non-zoning Wetland Bylaw, and the Town of Westford Non-zoning Wetlands Bylaw and associated Wetlands Rules and Regulations.

The following report describes the site, the delineation methodology, and the wetland resource areas encountered.

SITE DESCRIPTION

The site encompasses approximately 4.5 miles of an abandoned rail bed beginning at the intersection at Route 225 in Westford, continuing through the southwestern corner of Carlisle, and extending in a generally southerly direction through the Town of Acton to approximately the Acton-Concord municipal boundaries (Figures 1A and 1B). This section of the Bruce Freeman Rail Trail (BFRT, Phase 2A), as it is known, traverses residential, commercial, and undeveloped lands that include forested, shrub-dominated, and open meadow habitats. This section of the BFRT crosses Nashoba Brook five times and Butter Brook two times, and is flanked by their associated wetland resource areas in many locations (Figures 2A and 2B).

Floodzone

Portions of this corridor of the BFRT are located within or near flood-prone areas (Figures 3A and 3B). Copies of each of the FEMA Flood Insurance Rate Maps are provided for reference.

Town of Westford

In the Town of Westford, Community Panel No. 250225 0012B (dated June 15, 1983) identifies this section of the BFRT as falling within Zone C, an area that is determined to be outside the 100- and 500-year floodplains (FEMA panel 1).

Town of Carlisle

The section of the BFRT occurring in the Town of Carlisle is described on Community Panel No. 250187 0002C (dated May 17, 1988) as occurring within Zone C: areas of minimal flooding (FEMA panel 2).

Town of Acton

The portion of the BFRT within the Town of Acton is depicted on three FEMA maps (listed from north to south along the rail trail):

- Community Panel 250176 0005C, dated January 6, 1988 (FEMA panels 3, 4, and 5);
- Community Panel 250176 0004C, dated January 6, 1988 (FEMA panel 6); and
- Community Panel 250176 0007C, dated January 6, 1988 (FEMA panels 7 and 8).

In Acton, the rail trail traverses areas of 100-year flooding (Zone AE, base flood elevations determined), as well as areas of 500-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood (Zone X, shaded). Floodway areas within Zone AE have also been studied along portions of Nashoba Brook (hatched areas within Zone AE). Areas determined to be outside the 500-year flood plain also occur along this portion of the BFRT (Zone X, unshaded).

Rare Species Habitat

According to the most recent Natural Heritage Atlas (13th Edition; effective October 1, 2008), portions of this corridor of the BFRT traverse areas identified as *Estimated Habitat of Rare Wildlife* (EH 789) and *Priority Habitat of Rare Species* (PH 1159). The southernmost portion of this section of the BFRT is located near, but not within, PH 735 (Figures 4A and 4B). There are no certified vernal pools along this stretch of the BFRT corridor; however there is one Potential Vernal Pool (PVP) located to the east of the railbed, south of Brook Street and west of Great Road (see Figure 4B and site photos). As part of the permit approval process, a submission will be made with the Massachusetts Natural Heritage and Endangered Species Program (NHESP), as required under the Massachusetts *Endangered Species Act* (M.G.L. Ch. 131A) or MESA regulations at 321 CMR 10.00.

METHODOLOGY

Field biologists from the Horsley Witten Group, Inc. (HW) conducted field investigations on January 25 and 31, March 14, and April 5, 6, 19, and 20, 2007, and identified and delineated the boundaries of wetland resource areas within 100 feet of the railway right of way. The purpose of these evaluations was to determine the extent of wetland resource areas protected under the Massachusetts *Wetlands Protection Act* (M.G.L. Ch. 131 § 40) and its implementing Regulations (310 CMR 10.00), as well as the respective local wetlands bylaws, including the Town of Acton Wetland Protection Bylaw (Section F) and associated Rules and Regulations, the Town of Carlisle Non-zoning Wetland Bylaw, and the Town of Westford Non-zoning Wetlands Bylaw (Chapter 171) and associated Wetlands Rules and Regulations (Chapter 235).

Delineation of Bordering Vegetated Wetland

HW followed wetland resource area identification and on-site delineation procedure guidelines described in the Massachusetts Department of Environmental Protection (DEP) handbook, entitled *Delineating Bordering Vegetated Wetlands Under the Massachusetts Wetlands Protection Act* (March, 1995),

definitions within the Massachusetts *Wetlands Protection Act* Regulations, as well as the local rules and regulations within the Towns of Westford, Carlisle, and Acton.

The boundary of Bordering Vegetated Wetland (BVW) was determined through observations of the plant community and the soil morphology. Plants were identified to species level whenever possible, noting the wetland indicator status of plant species as identified in the *National List of Plant Species that Occur in Wetlands: Massachusetts* (Reed, 1988). Soils were assessed by applying the technical criteria outlined in *Field Indicators for Identifying Hydric Soils in New England* (Version 3, April 2004). The boundary of BVW was determined at the point where 50% or greater of the vegetation was comprised of wetland indicator species and where hydric conditions were encountered.

HW demarcated the BVW boundary with consecutively numbered, pink flagging stations, distinguishing between the western and eastern sides of the railbed with a “W” or an “E,” respectively. HW observed that in most areas, the existing topography along this portion of the BFRT was steeply sloping along the railbed embankments, and the BVW boundary was therefore distinct. HW prepared a representative set of DEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Data Forms (included in the appendix) along the western side of the rail bed just north of Great Road, near flagging stations W600/W601 where the topography is more gradually sloping from the railbed to the wetland.

Delineation of Isolated Freshwater Wetlands

For planning purposes, HW delineated the boundaries of any isolated wetland area encountered, which may be potentially protected and regulated under the federal *Clean Water Act* (33 U.S.C. 1251, *et seq.*) and/or any of the local wetland bylaws. HW followed the methodology under the 1987 Corps of Engineers Wetlands Delineation Manual (Technical Report Y-87-1) and any local regulatory definitions in these instances.

Determining Mean Annual High Water

The mean annual high water line (MAHW) of a river is defined as “*the line that is apparent from visible markings or changes in the character of soils or vegetation due to the prolonged presence of water and that distinguishes between predominantly aquatic and predominantly terrestrial land*” (310 CMR 10.58(2)(a) 2). Pursuant to these regulations, field indicators of “bankfull conditions” (changes in slope, changes in vegetation, stain lines, top of point bars, changes in bank materials or bank undercuts) were used to determine the MAHW associated with Butter Brook, Nashoba Brook, and any perennial tributaries.

Given the extent of MAHW and the associated 200-foot Riverfront Area along this section of the BFRT, HW demarcated the limit of bankfull conditions with unnumbered blue flagging labeled “MAHW.” As these delineations were done in the late winter/early spring, the extent of the MAHW was observed directly as the limit of the high water, with allowance made for any upgradient indicators of hydrology. Additionally, beaver activity resulted in obscured limits of MAHW, and therefore, the limit of the MAHW in certain areas (particularly surrounding the two Butter Brook crossings) was nearly coincident with the BVW boundary.

WETLAND RESOURCE AREAS UNDER THE MA WETLANDS PROTECTION ACT

Portions of this section of the BFRT are located within 100 feet of the following wetland resource areas: BVW, inland Bank, Land Under Waterbodies and Waterways, Bordering Land Subject to Flooding (BLSF), and within 200 feet of MAHW (i.e., within Riverfront Area).

Bordering Vegetated Wetland

BVW is defined at 310 CMR 10.55(2)(a) as “*freshwater wetlands that border on creeks, rivers, streams, ponds and lakes. The types of freshwater wetlands are wet meadows, marshes, swamps and bogs. Bordering Vegetated Wetlands are areas where the soils are saturated and/or inundated such that they support a predominance of wetland indicator plants. The boundary of Bordering Vegetated Wetland is defined at 310 CMR 10.55 (2)(c) as the line within which 50% or more of the vegetational community consists of wetland indicator plants and saturated or inundated conditions exist.*”

Land Under Waterbodies and Waterways

Land Under Water Bodies and Waterways is defined at 310 CMR 10.56(2)(a) as “*the land beneath any creek, river, stream, pond or lake. Said land may be composed of organic muck or peat, fine sediments, rocks or bedrock. The boundary of LUW is the mean annual low water level.*”

Bank

Bank is defined at 310 CMR 10.54(2)(a) as “*the portion of land surface which normally abuts and confines a water body. It occurs between a water body and a vegetated bordering wetland and adjacent floodplain, or, in the absence of these, it occurs between a water body and an upland. A Bank may be partially or totally vegetated, or it may be comprised of exposed soil, gravel or stone. The upper boundary of a Bank is first observable break in the slope or the mean annual flood level, whichever is lower. The lower boundary of a Bank is the mean annual low flow level*” [310 CMR 10.54(2)(c)].

Riverfront Area

Riverfront Area is defined at 310 CMR 10.58(2)(a)3 as “*the area of land between a river’s mean annual high-water line measured horizontally outward from the river and a parallel line located 200 feet away, except that the parallel line is located 25 feet away in Boston, Brockton, Cambridge, Chelsea, Everett, Fall River, Lawrence, Lowell, Malden, New Bedford, Somerville, Springfield, Winthrop, and Worcester;*”

The Massachusetts Wetlands Protection Act Regulations further state in section 10.58(2)(a)1.a.ii. that: “*If a river or stream is shown as perennial on the current U.S.G.S. map or more recent map provided by the Department, an assertion that it is intermittent must be supported by evidence by the person making the assertion or by the issuing authority upon its own initiative, which may include field observations that the river is not flowing, provided the date of observation is not within an extended drought; absence of a channel or banks; soils information showing the groundwater elevation is not at or near the surface; or other evidence.*”

Bordering Land Subject to Flooding

Bordering Land Subject to Flooding (BLSF) is defined at 310 CMR 10.57(1)(a)1 as “*an area with low, flat topography adjacent to and inundated by flood waters rising from creeks, rivers, streams, ponds or lakes. It extends from the banks of these waterways and water bodies; where a bordering vegetated wetland occurs, it extends from said wetland.*”

The boundary of Bordering Land Subject to Flooding is the estimated maximum lateral extent of flood water which will theoretically result from the statistical 100-year frequency storm. Said boundary shall be that determined by reference to the most recently available flood profile data prepared for the

community within which the work is proposed under the National Flood Insurance Program (NFIP, currently administered by the Federal Emergency Management Agency, successor to the U.S. Department of Housing and Urban Development). Said boundary, so determined, shall be presumed accurate. This presumption may be overcome only by credible evidence from a registered professional engineer or other professional competent in such matters” (310 CMR 10.57(2)(a)3).

According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (see Floodzone section above), portions of the BFRT are located within the 100-year floodzone. The approximate limits of which are shown on the existing conditions plans.

RESOURCE AREA DESCRIPTIONS

Wetland resource areas were encountered in each of the three municipalities associated with this section of the BFRT, although the majority of these wetland areas occur within the Town of Acton. The wetland resource areas delineated in the field include BVW and MAHW associated with Nashoba Brook, Butter Brook, and their respective perennial tributaries. A brief, general description of these wetland areas along with any unique features encountered is provided below, as encountered from north to south, and further broken out by municipality.

The attached existing conditions plans prepared by Nitsch Engineering entitled *Topographic Plan of Land, Bruce Freeman Rail Trail, Acton, Carlisle, Westford, Massachusetts* (dated April 2, 2007), and prepared for Greenman Pedersen, Inc. depict the boundaries of BVW and MAHW as determined by HW, the associated 100-foot buffer zone and 100-foot and 200-foot Riverfront Areas, respectively, and show the approximate extent of BLSF along this approximately 4.5-mile segment of the abandoned railbed.

Resource Areas in the Town of Westford

Under the Town of Westford Non-zoning Wetlands Bylaw (Chapter 171) and associated Wetlands Rules and Regulations (Chapter 235), Freshwater Wetlands are defined as “*wet meadows, marshes, swamps, bogs, areas where groundwater, flowing or standing surface water or ice provides a significant part of the supporting substrate for plant community for at least five (5) months of the year; emergent and submergent plant communities in inland waters; that portion of any bank which touches any inland waters.*”

Wetland resource areas encountered within the Town of Westford include BVW and an isolated freshwater wetland. The isolated *Freshwater Wetland* is located along the western side of the railbed immediately south of Route 225, and receives stormwater runoff from the adjacent roadways. This wetland area may be characterized as a transitional emergent marsh-shrub swamp dominated by sensitive fern (*Onoclea sensibilis*) and various goldenrods (*Solidago* spp.), with scattered individuals of elderberry (*Sambucus canadensis*), multiflora rose (*Rosa multiflora*), European buckthorn (*Frangula alnus*), and American elm (*Ulmus americana*) seedlings. Many of these shrubs are entangled with Oriental bittersweet (*Celastrus orbiculatus*). This isolated wetland area is demarcated by flagging stations W1 through W9.

The BVW encountered is typical of a forested swamp in Massachusetts with an adjacent upland forested community dominated by eastern white pine (*Pinus strobus*) with black huckleberry (*Gaylussacia baccata*), partridgeberry (*Mitchella repens*), tree clubmoss (*Lycopodium obscurum*), wintergreen (*Gaultheria procumbens*), bracken fern (*Pteridium aquilinum*), and occasional patches of sheep laurel (*Kalmia angustifolia*). Canopy species within the BVW include red maple (*Acer rubrum*) and eastern white pine with occasional American elm saplings. Shrub species are dominated by highbush blueberry

(*Vaccinium corymbosum*), swamp azalea (*Rhododendron viscosum*), winterberry (*Ilex verticillata*), and European buckthorn. Groundcover species encountered include cinnamon fern (*Osmunda cinnamomea*), goldthread (*Coptis trifolia*), skunk cabbage (*Symplocarpus foetidus*), sensitive fern, various sedges (*Carex* spp.), and patches of sphagnum moss (*Sphagnum* spp.). Pit and mound microtopography, pockets of standing water, and occasional stones were observed throughout the BVW. The BVW occurs on both the western and eastern sides of the railbed, and is immediately bordering a small, meandering intermittent stream (inland Bank), which flows beneath the railbed through a stone box culvert in an easterly direction. This forested swamp continues across the town boundary into the Town of Carlisle (at approximately flagging station E10). The BVW boundary is demarcated by flagging stations W10 through W14 and E1 through E26.

Resource Areas in the Town of Carlisle

The *Carlisle Non-Zoning Wetlands Bylaw* defines wetland resource areas in accordance with the Massachusetts *Wetlands Protection Act* and its regulations. Resource areas encountered within the Town of Carlisle include the BVW as described above, from approximately flagging station E10 through flagging station E26. The outermost portion of the buffer zone associated with another BVW located in the Town of Acton to the south comprises the remaining jurisdictional areas within the Town of Carlisle.

Resource Areas in the Town of Acton

In addition to the resource area definitions under the Massachusetts *Wetlands Protection Act*, the Town of Acton Wetland Protection Bylaw (Chapter F) and associated Rules and Regulations defines the term “wetlands” as either vegetated or non-vegetated areas.

- 1) Vegetated Wetlands “*are wet meadows, marshes, swamps and bogs where 50% or more of the vegetative community consists of wetland indicator plants as defined in the Massachusetts Wetlands Protection Act (M.G.L. Ch. 131, s. 40) and regulations at 310 CMR 10.00. When vegetation is not sufficient to determine the boundary of a wetland, characteristics of hydric soils or observations of flowing water, standing water or saturated soils may be used.*”
- 2) Non-Vegetated Wetlands are “*Any non-vegetated area such as a creek, brook, stream, river, pond, lake, lands under said waters, and certified and uncertified vernal pools as defined in the Massachusetts Wetlands Protection Act (M.G.L. Ch. 131, s. 40) and regulations at 310 CMR 10.00 and Section F3.14 of this Bylaw.*”

Under the Town of Acton Wetland Protection Bylaw, other resource areas including Bank (Section F3.16), Land Subject to Flooding (Section F3.17), and Riverfront Area (Section F3), are defined similarly as in the Massachusetts *Wetlands Protection Act*.

The BVW/Vegetated Wetlands associated with this section of the BRFT are divided into multiple areas within the Town of Acton; each of these areas is ultimately hydrologically connected to either Butter Brook or Nashoba Brook and/or their intermittent tributaries. For simplicity, each individual wetland area is not described in detail; however, general descriptions of each type of wetland area encountered from north to south are provided below. HW completed the field work in stages, as reflected by the flagging sequences. The numbering sequences were continued from the numbering in Weston and Carlisle in the northern section; a 500-series was created south of the Route 27/Ledge Rock Way intersection (beginning on Sheet EX-9), and an 800-series begins south of Brook Street (beginning on Sheet EX-15). Please refer to the site plans for the exact numbering sequences.

The BVW in the northernmost sections of the BFRT corridor (i.e., the segment located to the east of Main Street/Route 27) are associated with Butter Brook, a perennial tributary to Nashoba Brook. Forested swamps in this area are located both to the west and east of the railbed, where the BVW is dominated by a canopy of red maple and eastern white pine, and a shrub community dominated by highbush blueberry, European buckthorn, arrowwood (*Viburnum dentatum*), and occasional winterberry and fetterbush (*Leucothoe racemosa*). Groundcover species include scattered clumps of tussock sedge (*Carex stricta*), cinnamon fern, and skunk cabbage along with patches of sphagnum moss.

Northwest of the first (northernmost) intersection with Route 27 is a small isolated wetland (flagging series W58 through W64) confined by moderate slopes on all sides, which is dominated by European buckthorn and seedlings of red maple and eastern white pine, with skunk cabbage dominating the groundcover. This area appears to receive stormwater runoff.

The railbed crosses Butter Brook twice with wooden bridges, which are in somewhat close proximity to each other. At the time of our site evaluations, beaver activity was particularly prevalent in these areas, where Butter Brook traverses an open shrub swamp community dominated by silky dogwood (*Cornus amomum*), winterberry, and buttonbush (*Cephalanthus occidentalis*); patches of purple loosestrife (*Lythrum salicaria*), common reed (*Phragmites australis*), and various sedges were also observed. A heron rookery is located in the forested area to the west, somewhat distant from the railbed itself (see photos along Butter Brook). The railbed in this location is somewhat narrow with moderately sloping embankments dominated by eastern white pine, various oaks (*Quercus* spp.), and European buckthorn.

Southwest of the driveway to the Nashoba River Sportsman's Club, is a second, open shrub swamp community located at the base of the steeply sloping western embankment of the BFRT. Here the community is dominated by a mix of highbush blueberry, swamp azalea (*Rhododendron viscosum*), red chokeberry (*Aronia arbutifolia*), maleberry (*Lyonia ligustrina*), and nannyberry (*Viburnum lentago*) with seedling and sapling red maple and gray birch (*Betula populifolia*), scattered among the shrubs are clumps of cinnamon fern, royal fern (*Osmunda regalis*), and tussock sedge. HW observed approximately six inches of standing water at the time of our April 2007 site evaluation.

Further south, beyond the condominium community off Eastern Road, the BFRT enters a light industrial area, which continues until the intersection of Route 27/Ledge Rock Way. Here a series of interconnected BVWs was observed and delineated along both sides of the railbed, along with isolated wetland areas as would be protected under the Acton Wetland Protection Bylaw and/or the Federal *Clean Water Act*. Many of these wetlands are immediately adjacent to stormwater facilities associated with the various businesses, and/or receive some stormwater runoff from these areas.

500-Series

Immediately south and east of the Route 27/Ledge Rock Way intersection, the BVW again becomes forested and is associated with two small open ponded areas located on either side of the railbed, connected by a 30-36-inch culvert. To the west of the railbed, the wetland community consists primarily of the open ponded area, which receives stormwater input from surrounding impervious areas. To the east, the ponded area is surrounded by a narrow band of transitional shrub swamp-forested swamp community. Dominant vegetation in this area includes saplings and seedlings of red maple, gray birch, eastern white pine, and American elm. Shrub species observed include highbush blueberry, winterberry, swamp azalea, maleberry, and silky dogwood. This open ponded area transitions to a narrow intermittent stream channel, approximately two to three feet wide, that is confined by a steeply sloping hill to the east. Vegetation observed along the periphery of this stream channel (inland Bank) is similar to those species

observed along the upgradient BVW. This stream channel eventually tapers to an end at flagging station E529.

South and west of the intermittent stream channel is a forested swamp dominated by red maple and eastern white pine with yellow birch (*Betula alleghaniensis*) saplings and sparsely scattered individuals of American elm saplings. European buckthorn is the dominant shrub species with occasional clumps of highbush blueberry and scattered Japanese barberry (*Berberis thunbergii*). Interior portions of this forested swamp are dominated by clumps of skunk cabbage, as well as a few dense clumps of poison sumac (*Toxicodendron vernix*). Beginning at approximately flagging station W513, is a perennial stream which flows parallel to the railbed in a southerly direction (see photos).

This perennial tributary to Nashoba Brook passes beneath the railbed and flows within the interior of the forested swamp on the eastern side of the railbed. The forested swamp along the eastern side of the BFRT in this location is similar in species composition with dominant canopy species of red maple and eastern white pine with occasional spruce (*Picea* spp.) and green ash (*Fraxinus pennsylvanica*). Dominant shrub species include highbush blueberry, winterberry, European buckthorn and silky dogwood. Groundcover species observed include skunk cabbage, cinnamon fern, various sedges, and patches of sphagnum moss.

At approximately flagging station E557, a railroad spur extends eastward from the BFRT toward the main branch of Nashoba Brook. South of this spur, the plant community transitions to a more open canopy shrub swamp that is dominated by silky dogwood and swamp azalea, with dense areas of sweet gale (*Myrica gale*) and buttonbush. The BFRT crosses Nashoba Brook at approximately flagging station E568/W553, where it continues to flow in a southerly direction on the western side of the railbed. Beaver activity was also observed in this area at the time of our site evaluations. In this location along the BFRT, the BVW is characteristic of a transitional shrub-swamp emergent marsh community, which continues to the intersection of Great Road, where Nashoba Brook flows beneath Great Road to the west of the BFRT. Immediately south of Great Road, only a fringe of the BVW falls within 100 feet of the railbed, as Nashoba Brook flows to the southwest.

South of the Great Road intersection and north Brook Street intersection, the BVW is associated with a ponded area that is located to the west of the rail bed (see USGS Figure 2B; see also photos). The ponded area is interspersed with clumps of shrubs, and the vegetative community along the pond is characteristic of a shrub swamp, dominated by red maple, eastern white pine, gray birch, and scattered swamp white oak (*Quercus bicolor*) saplings with highbush blueberry, maleberry, swamp azalea, and European buckthorn. Purple loosestrife was observed throughout this shrub swamp community. The ponded area is connected to the BVW to the east of the railbed by a series of culverts. To the east, the plant community composition is considerably different, dominated by patches of common reed, purple loosestrife, and reed canary-grass (*Phalaris arundinacea*), with scattered patches of European buckthorn and occasional gray birch and red maple saplings.

800-900-Series

Nashoba Brook crosses beneath Brook Street (off-site), where it once again flows through a forested swamp community to the west, and a transitional forested swamp-shrub swamp-emergent marsh community to the east. Between Brook Street and Concord Road to the south, the BFRT crosses Nashoba Brook twice with two wooden bridges: the first crossing is at approximately flagging stations W814/E812, and the second crossing is at approximately flagging stations E860/W856 (see photo). Among the transitional forested swamp-shrub swamp community to the east of the railbed, HW observed two areas of ponded water. These areas were functioning as vernal pool habitat (wood frog vocalizations)

at the time of our April 2007 site visits. The larger of these two ponded areas (located at approximately flagging stations E844-E846) is identified as a Potential Vernal Pool by the NHESP (see Figure 4B).

Following this crossing with the BFRT, Nashoba Brook remains along the western side of the railbed until it flows into Ice Box Pond, and ultimately flows beneath Concord Road. Along this stretch, the BVW continues as a transitional forested swamp-shrub swamp community, and in the southern reaches is confined to a narrow band along the rocky embankments. East of the railbed is a series of small intermittent streams with associated narrow bands of BVW that are largely confined by commercial properties along Great Road. Many of these small pockets of BVW receive stormwater input from the surrounding impervious areas. The plant communities within these narrow BVWs are similar in composition with sapling red maples, European buckthorn, occasional upgradient multiflora rose (*Rosa multiflora*), and groundcover species including sensitive fern, and various sedges and rushes (*Juncus* spp.). Each of these areas is hydrologically connected to the larger BVW to the west of the railbed through a series of culverts and/or headwalls. At approximately flagging stations E935/W954, HW observed that the BFRT crosses an unnamed perennial tributary to Nashoba Brook (see Sheet EX19) which appears to originate from a series of ponded areas just south of Strawberry Hill Road to the northeast. This stream is shown as perennial on the current USGS map (Figure 1B), therefore meeting the presumptive definition of a river.

South of Concord Road, the BFRT crosses Nashoba Brook one final time (at approximately flagging stations W1000/E946), where the BVW again becomes forested. Nashoba Brook parallels the BFRT as it flows in a southerly direction, crosses beneath Wetherbee Street, and ultimately flows beneath Route 2 in the Town of Concord.