NOTICE OF INTENT - WELLS STATE PARK TRAIL MAINTENANCE & ACCESSIBILITY UPGRADES

APRIL 2023

PREPARED FOR

Massachusetts Department of Conservation and Recreation (DCR)

PREPARED BY

SWCA Environmental Consultants

SWCA
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April 3, 2023

Sturbridge Conservation Commission
301 Main Street
Sturbridge, MA 01566

Re: Notice of Intent – Mill Pond Trail Maintenance and Accessibility Improvement
Wells State Park, Sturbridge, MA
SWCA Project No. 72861

Dear Commission Members:

On behalf of the Massachusetts Department of Conservation and Recreation (Applicant), SWCA Environmental Consultants (SWCA) has prepared this Notice of Intent (NOI) application for trail maintenance and improvement at the existing Mill Pond Trail Loop within Wells State Park in Sturbridge, Massachusetts (Parcel 660-01233-159). Trail maintenance and improvements will occur within portions of Bordering Vegetated Wetland, Riverfront Area, and Buffer Zone to resource areas; however, impacts will only occur within Riverfront Area and Buffer Zone totaling 6,010 square feet of temporary work associated with improvements of the existing trail and 55 square feet of permanent impacts associated with drainage improvements (40 square feet) and a new wheelchair rest area (15 square feet) adjacent to the trail to meet accessibility standards. The 55 square feet of trail widening will remain as pervious surface area. These resource areas are regulated under the Massachusetts Wetlands Protection Act (M.G.L. c. 131 § 40) and its implementing regulations (310 CMR 10.00 *et seq*.) as well as the Town of Sturbridge Wetland Protection Bylaw (Ch. 286) and implementing regulations (Ch. 365). The trail maintenance and improvement activity proposes to improve existing conditions and does not propose alteration to resource areas or adverse impacts to resource areas.

SWCA is submitting two hard copies of this NOI application, two copies of the supporting plans, as well as a $450 check made out to the Town of Sturbridge for the town's Bylaw Category 2 application fee as well as the Town's portion of the Wetland Protection Act Category 2 NOI fee of $387.50. Fees under the Massachusetts Wetland Protection Act for the State review fee portion are paid via the State eDEP electronic filing system. A copy of this NOI accompanied by a Massachusetts Endangered Species Act (MESA) Project Review to be concurrently review by the Natural Heritage and Endangered Species Program (NHESP) as the site is located within Priority Habitat of Rare Species and Estimated Habitat for Rare Wildlife. Due to the size of the property (1,400 acres), the work area's distance from any adjacent properties, and via previous correspondence with the Commission, we are requesting a waiver of the Abutter Notice process.

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We look forward to presenting this project to the Conservation Commission at the next scheduled public meeting. If you have any questions regarding this application or would like to set up a site walk, please do not hesitate to me at our office.

Sincerely,

Christin McDonough
Certified Wildlife Biologist (CWB) & Professional Wetland Scientist (PWS)

cc: Massachusetts Department of Environmental Protection (MA DEP), Central Regional Office
Paul Jahnige, Massachusetts Department of Conservation and Recreation

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Prepared for

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SWCA Project No. 72861

April 2023

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1.0 INTRODUCTION

On behalf of the Massachusetts Department of Conservation and Recreation (DCR), SWCA Environmental Consultants (SWCA) has prepared this Notice of Intent (NOI) application for trail maintenance and accessibility upgrades along a portion of the Mill Pond Trail in Wells State Park, located in Sturbridge, Massachusetts (Parcel 660-01233-159) (the Site). Wells State Park is a ±1,400-acre public recreation area located off Route 49 in Sturbridge, providing ±12 miles of trails for passive recreational opportunities such as hiking, biking, equestrian riding, and cross-country skiing. Walker Pond, encompassing ±104 acres, provides opportunities for boating and angling. The Park includes a ±60-acre campground with beach access at Walker Pond. The terrain is rugged with rocky ledges, outcrops, and a metamorphic rock cliff (Carpenter Rocks), interspersed within oak-hickory and northern hardwood forest communities with sections of eastern white pine (*Pinus strobus*).

The Mill Pond Trail is a ±2.9-mile loop popular for passive recreation including birding, hiking, and walking. The trail encounters forested wetlands, forested uplands, and crosses a stream system in three locations. Proposed improvements along the Mill Pond Trail include vegetation management, drainage improvements, spot-resurfacing, maintenance/upgrades to an existing timber bridge, and upgrades to portions of the trail to meet accessibility standards. Portions of the Mill Pond Trail consist of either packed earth or packed stone dust over a geogrid. Figures illustrating the location of Wells State Park are included in Appendix A. Figure 1 illustrates the location of the Site on a U.S. Geological Survey (USGS) quadrangle. Figure 2 illustrates the location of the trail network on an orthophotograph map. Plans titled, "DCR 837 Wells State Forest, Proposed Conditions" and illustrating the location of jurisdictional resource areas and proposed work areas are also included in Appendix A.

The Mill Pond Trail is located within Priority Habitat for Rare Species (PH 942) and Estimated Habitat for Rare Wildlife (EH 721) (Figure 3, Appendix A), indicating the project will be subject to the Massachusetts Endangered Species Act (M.G.L. c.131A) (MESA) and its implementing regulations (321 CMR 10.00 et seq.). Therefore, we are submitting a copy of this application to the Massachusetts Natural Heritage & Endangered Species Program (NHESP), who oversee and implement MESA, along with a review fee of $300 for projects impacting less than five acres.

The purpose of the proposed trail maintenance activities outlined in this NOI is to improve existing resource area crossings, improving drainage near resource areas, and upgrading the existing crossing over a perennial stream to meet accessibility standards. Each of these are detailed further below (see Section 5).

Trail maintenance and improvement activities are proposed to occur within a portion of Bordering Vegetated Wetland (BVW), Inland Bank, 200-foot Riverfront Area (RFA), and 100-foot Buffer Zone. Permanent impacts totaling 55 square feet are proposed to occur within RFA and Buffer Zone as part of drainage improvements (40 square feet) and the addition of a 15 square foot wheelchair rest spot at a steeper section of existing trail. Approximately 6,010 square feet of temporary impacts associated with trail upgrades are located within the 200-foot RFA and Buffer Zone to resource areas. All temporary work will occur within the existing trail tread, and permanent impacts will be adjacent to the existing trail, but all areas will remain pervious. No new work is proposed to occur within Bordering Vegetated Wetlands (BVWs) or Inland Bank. The locations of the trails will not change. All proposed trail improvements shall remain within the footprint of the existing trail tread, with the exception of temporary erosion controls and proposed drain dip spillways intended to improve drainage. The proposed restoration consists of surface treatment with trail tread only. Photographs illustrating the existing conditions and resource areas are included in Appendix B.

This permit application has been developed in accordance with the Massachusetts Wetlands Protection Act (M.G.L. c. 131 § 40) (WPA) and its implementing regulations (310 CMR 10.00 *et seq*.) as well as the Town of Sturbridge Wetland Protection Bylaw (Ch. 286) (Bylaw) and implementing regulations (Ch. 365) for work proposed within jurisdictional resource areas. A copy of WPA Form 3 (application for NOI) is included in Appendix C. In accordance with the WPA and the Bylaw, two hard copies and a digital copy of this NOI are being submitted to the Sturbridge Conservation Commission (Commission). Copies of this submittal are also being submitted to the Massachusetts Department of Environmental Protection (MassDEP) Central Regional Office via the eDEP electronic filing site along with the associated fees of $362.50 (WPA review fee for the Commonwealth, paid via eDEP) and $387.50 (WPA review fee for the Town of Sturbridge). The Sturbridge Bylaw review fee of $450.00 is also included in this application and a copy of the receipt is included in Appendix C. Copies of each payment are included in Appendix C. A copy of this NOI and accompanying MESA review are concurrently being reviewed by NHESP. A copy of the paid review fee and the mailing receipt are also included in Appendix C.

2.0 SITE DESCRIPTION - EXISTING CONDITIONS

The Mill Pond Trail is located within a mosaic of upland and wetland forest and crosses an unnamed stream system three times. The trail is bounded to the north by the Transmission Trail, which follows an existing utility right-of-way (ROW) and a wetland/stream complex associated with Walker Pond to the east. To the south and west, the area is bounded by upland hardwood forest which slopes steeply to the west towards Carpenter Rocks. DCR has a current approved Forest Cutting Plan (FCP) (approved February 2022) for long-term timber management within Wells State Park authorizing the removal of trees between November 1 and March 31, with a focus on removing red spruce (*Picea rubens*). Site figures and plans depicting the location of Wells State Park and the Mill Pond Trail Loop are included in Appendix A. Representative photographs of the Site and adjacent communities are included in Appendix B.

2.1 Soils

According to the Web Soil Survey (Natural Resources Conservation Service [NRCS] 2019), soils mapped on the Site within the vicinity of the Mill Pond Trail are classified as Canton fine sandy loam, 0 to 8 percent slopes, extremely stony; Woodbridge fine sandy loam, 0 to 8 percent slopes, extremely stony; and Hinkley loamy sand, 8 to 15 percent slopes within the forested upland areas and Ridgebury fine sandy loam, 3 to 8 percent slopes, extremely stony and Swansea muck, 0 to 1 percent slopes within forested wetland areas.

2.2 Campground Areas

Wells State Park includes a ±60-acre campground with beach access to Walker Pond. The Mill Pond Trail loop is north of the campground.

2.3 Upland Forested Areas

Wells State Park consists entirely of undeveloped forest with the exception of the visitor center, campground facilities, paved access roads, and existing transmission ROW. Trees around the trail system are dominated by white pine, white ash (*Fraxinus americana*), northern red oak (*Quercus rubra*), mixed birch (*Betula lenta, B. alleghaniensis,* and *B. papyrifera*), red pine (*Pinus rufus*), eastern hemlock (*Tsuga canadensis*), and red maple (*Acer rubrum*) in the canopy. Poison ivy (*Toxicodendron radicans*) is thriving

throughout the Park, as well as several undesirable species of non-native plants, including Morrow's honeysuckle (*Lonicera morrowii*), multiflora rose (*Rosa multiflora*), Japanese barberry (*Berberis thunbergii*), and Asiatic bittersweet (*Celastrus orbiculatus*), for example.

2.4 Walker Pond

Walker Pond is a±104-acre pond primarily used for hiking, swimming, kayaking, angling, bird-watching, and other recreational activities. An historic mill pond is hydrologically associated with and just north of Walker Pond (and associated with the Mill Pond Trail).

3.0 RESOURCE AREAS

SWCA reviewed multiple mapping resources available from the Massachusetts Geographic Information System (MassGIS) and others including, but not limited to, MassDEP mapped wetlands and hydrologic connections, hydrography, aerial imagery, FEMA Flood Insurance Rate Maps (FIRMs), USGS topographic quadrangles, potential and certified vernal pools, NRCS soils, and NHESP rare species habitat mapping among others.

SWCA completed a site visit to field verify and delineate the wetlands and streams on July 6, 2022 to review jurisdictional resource areas within and adjacent to proposed trail maintenance and improvement activities. SWCA utilized pink, fluorescent polyvinyl surveyor flagging with "Wetland Delineation" printed in black to demarcate the boundaries of each wetland and blue flags to demarcate Bank/Mean Annual High Water (MAHW). Each flag was assigned a unique alphanumeric code in the field. Figure 4 illustrates the on-Site resource areas (Appendix A) and their regulatory buffer zones. Figure 5 illustrates the limits of the 100-year floodplain. Representative photographs are included in Appendix B. The following sections describe the on-site regulated resource areas.

3.1 Resource Area Delineation Methodology

SWCA performed a delineation using a multiple parameter method approach following the WPA the methodology described in *Delineating Bordering Vegetated Wetlands Under the Wetlands Protection Act* (MassDEP 1995), and the *Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory 1987) and its supplement, the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region, Version 2.0* (U.S. Army Corps of Engineers [USACE] 2011). In accordance with 310 CMR 10.55(2)(c)1., the flagged vegetated wetland boundaries include all areas "within which 50% or more of the vegetational community consists of wetland indicator plants and saturated or inundated conditions exist."

This approach emphasizes the use of hydrophytic vegetation in combination with the presence of either hydrology and/or hydric soils. Under the WPA, wetland indicator ratings for vegetation are defined under the *National List of Plant Species That Occur in Wetlands* (Reed 1988) as well as the vegetation species criterion described in the WPA. It should be noted that some wetland indicator ratings for vegetation have been recently revised for wetlands regulated by the USACE under *The National Wetlands Plant List: Version 3.4* (USACE 2018).

We understand that MassDEP recently published new BVW delineation guidance approach under the *Massachusetts Handbook for Delineation of Bordering Vegetated Wetlands* (Jackson et al. 2022). This new guidance was released February 2023 and the on-Site wetlands and streams were delineated in July 2022.

The delineation also included the examination of soils and the methodology described in the MassDEP Delineation Handbook. Identification of hydric soil as an indicator of wetland hydrology followed criteria provided in *Field Indicators of Hydric Soils in the United States, Version 8.2* (U.S. Department of Agriculture [USDA] 2018), *Field Indicators for Identifying Hydric Soils in New England, Version 4* (New England Hydric Soil Technical Committee 2020), as well as the USACE Regional Supplement. In accordance with the handbook, the flagged wetland boundaries include all areas which contained a majority of hydrophytes (i.e., ≥50%) and the presence hydric soils, with consideration given to other indicators of wetland hydrology when present.

SWCA examined soils, evidence of hydrology, and vegetation to identify limits of the federal, state, and/or local definition of a jurisdictional wetland, and bankfull indicators to identify limits of the MAHW mark. Hydric soils and hydrophytic vegetation were able to be evaluated since site investigations occurred during the growing season and evidence of hydrology was able to be observed.

SWCA delineated wetlands within approximately 100 feet of the proposed trail maintenance areas using a consecutive alphanumeric labeling system using pink and black flagging tape inscribed with "Wetland Delineation" for all vegetated wetlands, and blue flagging tape for all waterbodies.

3.2 Inland Bank

Inland Bank is the resource area which confines waterways and water bodies. For streams, it extends from Mean Annual Low Water (MALW) to MAHW. As set forth in 310 CMR 10.54(2)(a)-(c), Inland Bank is defined as, "the portion of the land surface which normally abuts and confines a water body. It occurs between a water body and a BVW and adjacent floodplain, or in the absence of these, it occurs between a water body and an upland. The upper boundary is the first observable break in slope or MAHW, whichever is lower. The lower boundary is the MALW level." In the case of this delineation, MAHW was coincident with the first observable break in slope and, thus coincident with the upper limit of Inland Bank.

Bank on the property is associated with the unnamed stream system. The Bank within the vicinity of trail crossings are vegetated with red maple, yellow birch, eastern white pine, and poison ivy. Inland Bank is afforded a 100-foot Buffer Zone regulated by both the WPA and Bylaw/Bylaw.

Table 1 summarizes the portions of Bank flagged by SWCA.

Table 1. Streams identified within the ± 100-feet of the proposed trail maintenance and improvement activity, Mill Pond Trail, Sturbridge, MA

Stream ID	Type	Stream Flag Sequence	Comments
Stream 2/4	Perennial	S2-100 to S2-109 S2-200 to S2-227 S2-300 to S2-310 S2-400 to S2-408 S4-092 to S4-108 S4-200 to S4-220 S4-300 to S4-305 S4-400 to S4-405	Associated with Wetlands W2 and W3. Stream flows southeast to join north end of Walker Pond.
Stream 3	Perennial	S3-100 to S3-109 S3-200 to S3-209 S3-300 to S3-303 S3-400 to S3-404 S3-500 to S3-507 S3-600 to S3-608 S3-700 to S3-703	Associated with Wetland W3. Stream flows east at trail crossing.

Stream 2/4: Stream S2 is not mapped on the most current USGS topographic map (310 CMR 10.58(2)(a)1.a.); however, this stream is affected by beaver activity and has become impounded. Therefore, we propose this stream is presumed to flow perennially. The Mill Pond Trail crosses Stream S2 at flag S2-100 at an existing footbridge. The footbridge is in good condition and DCR does not plan to upgrade the bridge at this time.

Stream S4 flows southeast leading to a larger open water area. The stream ranges in width along its course with bankfull widths ranging between ±10-feet to ±50-feet in the upper reaches and ±30-feet downstream. Benthic material at Stream S4 consists of cobble with areas of silt.

Stream 3: Stream S3 is mapped on the most current USGS topographic map and therefore is jurisdictional as a perennial stream. Stream S3 flows southeast. Benthic material consists of cobble with areas of silt immediately downstream of the trail crossing, and cobble/boulder immediately upstream of the crossing. A portion of the Bank consists of a rock wall. Upstream of the trail crossing, Stream S3 bankfull widths range between ±10-feet to ±25-feet wide and ±8-feet to ±15-feet downstream of the crossing.

3.3 Bordering Vegetated Wetlands

As set forth in 310 CMR 10.55(2)(a-c), a BVW is defined as areas where the soils are saturated and/or inundated such that they support a predominance of wetland indicator plants and the BVW boundary is determined as "the line within which 50% or more of the vegetational community consists of wetland indicator plants and saturated or inundated conditions exist." The Bylaw incorporates the definition of BVW as defined in the WPA. BVWs are afforded a 100-foot Buffer Zone based on the WPA and Bylaw.

SWCA identified two BVWs within 100 feet of areas where proposed trail maintenance or improvements are proposed to occur. Flags were placed at the jurisdictional transition from wetland soils, wetland vegetation, and hydrology to upland soil, upland vegetation, and a lack of hydrology. Photographs representing overall wetland systems are included in Appendix B. The following BVWs were identified:

Table 2. Bordering Vegetated Wetlands identified within ± 100-feet of the Site

Wetland ID	Wetland Type*	Wetland Flag Sequence
Wetland W2	PFO	W2-100 to W2-126 W2-200 to W2-211 W2-300 to W2-308 W2-400 to W2-426
Wetland W3	PFO	W3-100 to W3-112 W3-200 to W3-206 W3-300 to W3-309 W3-400 to W3-402 W3-500 to W3-513 W3-600 to W3-610 W3-700 to W3-705 W3-800 to W3-803 W3-900 to W3-905

**Palustrine Forested Wetland (PFO)*

BVWs on the Site border on perennial stream system within the Site. The BVWs contained both primary and secondary indicators of hydrology, at least 50 percent dominance of hydrophytic plants, and contained indicators of hydric soils. Vegetation within the BVWs included red maple, yellow birch, winterberry (*Ilex verticillata*), green ash (*Fraxinus pensylvanica*), American elm (*Ulmus americana*), sensitive fern (*Onoclea sensibilis*), jack-in-the-pulpit (*Arisaema triphyllum*), jewelweed (*Impatiens capensis*), Virginia strawberry (*Fragaria virginiana*), and poison ivy.

3.4 Isolated Vegetated Wetlands

Isolated Vegetated Wetlands (IVWs) are described as non-tidal, inland freshwater wetlands, with no hydrologic surface water connection to adjacent BVWs or streams. They meet the definition of a wetland by containing at least one primary or two secondary indicators of hydrology, a predominance of hydrophytic vegetation, and indicators of hydric soils. While small IVWs are typically not regulated under the WPA, they may be regulated by the USACE; however, under federal jurisdiction, they do not receive a 100-foot Buffer Zone. Under the Bylaw, IVWs are regulated and also receive a 100-foot Buffer Zone.

SWCA identified one IVW within 100 feet of areas where proposed trail maintenance or improvements are proposed to occur. Flags were placed at the transition from wetland soils, wetland vegetation, and hydrology to upland soil, upland vegetation, and a lack of hydrology. Photographs representing overall wetland systems are included in Appendix B. Wetland W1 is flagged as W1-100 through W1-115. This PFO is dominated by red maple, yellow birch, winterberry, sensitive fern, and poison ivy and is located in the southern portion of the project area.

3.5 Buffer Zone

The WPA regulates a 100-foot Buffer Zone associated with Inland Bank and BVW. The Bylaw further regulates the 100-foot Buffer Zone as a resource area. In addition, the Bylaw claims jurisdiction over lands within the 200-foot buffer zone to these resource areas, whether or not they border surface waters. The Bylaw further regulates an inner 50-foot No Structure buffer and a 25-foot No Disturb buffer. All

wetlands and streams delineated by SWCA are subject to the Bylaw whereas wetland W1 is presumed not subject to the WPA. No performance standards are set forth for Buffer Zone under the WPA.

Owing to circumstances relating to existing soil conditions and topography within selected portions of the existing trail, erosion is occurring affecting downgradient resource areas. Left as is, conditions will worsen. The purpose of the proposed maximum of 40 square feet for drainage improvements within the 25-foot buffer zone to improve drainage, erosion, and nearby resource areas. As these select areas are already 'disturbed' (trail) and this proposal is intended to improve the protection of resource areas, we propose there will no significant adverse impacts to resource areas as a result of the drain dips. These areas will remain pervious. No trees are proposed to be removed to create the 15 square foot wheelchair turnaround rest area and this will also remain pervious. This constitutes a resource area improvement to existing conditions associated with a recreational trail.

3.6 Land Under Water

As defined in 310 CMR 10.56(2)(a-c), "Land Under Waterbodies and Waterways is the land beneath any creek, river, stream, pond, or lake. Said land may be composed of organic muck or peat, fine sediment, rocks or bedrock." LUWW occurs below MALW; however, MALW was not separately delineated in association with the project adjacent portion of the unnamed perennial stream and LUWW is assumed to occur between the Banks. LUWW lies entirely within protected resource areas (i.e., Banks) and does not have a buffer zone.

LUWW is associated with the unnamed perennial stream system within the Site. No work within LUWW is proposed for this project.

3.7 Bordering Land Subject to Flood

Bordering Land Subject to Flooding (BLSF) is defined 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 BVW occurs, it extends from said wetland…The boundary of BLSF is the estimated maximum lateral extent of flood waters which will theoretically result from the statistical 100-year frequency storm. Said boundary shall be that determined by the 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)…said boundary, so determined, shall be presumed accurate…"

Typically, BLSF coincides with the 100-year flood zone (i.e., the area inundated by the 1% chance for annual flood). As part of evaluating resource areas at the Site, SWCA reviewed the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Community Map Numbers 25027C1002E and 25027C0768E for the Town of Sturbridge and determined BLSF does occur within Wells State Park; however, no portion of the Mill Pond Trail occur within BLSF (FEMA 2011a, 2011b). Figure 5 in Appendix A depicts the extent of BLSF within and in proximity to the Site.

3.8 Riverfront Area

An unnamed perennial stream system flowing southeast into Walker Pond crosses the Mill Pond Trail three times. A portion of this stream is mapped on the most current USGS topographic map as a dark blue solid line this stream meets the definition of perennial under 310 CMR 10.58(2)(a)1.a. (USGS 2021). The stream delineated by SWCA as Stream S2 is not mapped on the most current USGS topographic map;

however, the stream is beaver impacted, impounded, and was observed to be flowing year-round. For the purposes of this trail maintenance work, we propose these streams are connected and are perennial.

Perennial streams are afforded a 200-foot RFA extending outward 200-feet from MAHW on each side of the stream. 310 CMR 10.58(2)(a) states, "[RFA] is the area of land between a river's [MAHW] line measured horizontally outwards from the river with a parallel line located 200-feet away." The RFA may include other resource areas or their buffer zones. The RFA does not have a buffer zone.

Within the Project area, 200-foot RFA consists of the undeveloped mixed successional forest and the existing trail.

4.0 OTHER SENSITIVE AREAS

4.1 Vernal Pools

SWCA biologists reviewed available MassGIS datasets to determine if the Project is located within or near mapped Certified Vernal Pools (CVPs) or Potential Vernal Pools (PVPs). There are no CVPs or PVPs mapped within or near the Project according to available MassGIS data (MassGIS 2023, 2013). In addition, no PVPs were observed during the site visit.

4.2 Rare Species Habitat

SWCA reviewed GIS databases to determine if the project is located within NHESP Priority Habitats of Rare Species (Priority Habitat) or Estimated Habitats of Rare Wildlife (Estimated Habitat) (MassGIS 2021a, 2021b). The Mill Pond Trail where work proposed is located within Priority Habitat of Rare Species (PH 942) and Estimated Habitat of Rare Wildlife (EH 721) (see Figure 3). Estimated Habitat is a subset of Priority Habitat that identifies habitats of wetland dependent wildlife. In compliance with MESA and the WPA, a streamlined Project Review is concurrently being filed with NHESP. There are no CVPs or PVPs in or adjacent to the Mill Pond Trail where the project is proposed.

4.3 Outstanding Resource Waters

SWCA reviewed the MassGIS database to determine if the site was located within Outstanding Resource Waters (ORWs). ORWs are watershed areas that have been classified as such under the Massachusetts Surface Water Quality Standards and are areas that contain surface waters and their tributaries, including certain wetlands, that have been designated for protection based on their outstanding socio-economic, recreational, ecological and/or aesthetic values. These waters have been identified so that the quality of the waters may be protected and maintained. There are no ORWs located within or adjacent to the proposed project area (MassGIS 2010).

4.4 Areas of Critical Environmental Concern

SWCA reviewed MassGIS data layers to determine if the Project is located within any Areas of Critical Environmental Concern (ACEC). An ACEC is a designated area in Massachusetts that receives special recognition because of the quality, uniqueness, and significance of its natural and/or cultural resources. ACECs are identified so that they may be protected and maintained. SWCA determined that there are no ACECs within or near the site (MassGIS 2009).

5.0 PROPOSED TRAIL MAINTENANCE AND IMPROVEMENT

The majority of the Mill Pond Trail is in relatively good condition; however, portions of the trail do not currently meet accessibility standards and a portion of the trail is subject to erosion. Select areas have been identified where upgrades may be warranted to meet accessibility standards, such as puncheon installation at a wet crossing (at Wetland W2), a puncheon ramp at the existing Stream S3 crossing, placement of additional material such as crushed stone to smooth bumps in the trail, a wheelchair rest area, spot grading to smooth the trail to allow for wheelchair accessibility, and additional signage. The new puncheon will occur with the existing trail tread only; no trail widening is proposed for the puncheon placement. Four new drain dips are proposed to improve drainage, which will require minor spot grading. The temporary impacts associated with this work total 6,010 square feet of RFA and the 100-foot buffer zone; 2,045 square feet of which is within the 25-foot Buffer Zone (these areas overlap; see Table 3). The total permanent impacts are associated with drainage improvements and the addition of a wheelchair rest area, totaling 55 square feet (see Table 4).

Table 3. Location and summary of temporary* proposed trail maintenance activity, Mill Pond Trail, Wells State Park, Sturbridge, MA

Temporary Resource Impacts* (square feet)	Drain Dips	Large Puncheon (at S3)	Small Puncheon (at W2)	Trail Tread Regrading Area	Total Disturbance
BVW	0	0	0	0	0
Bank	0	0	0	0	0
BLSF	0	0	0	0	0
25-foot Buffer Zone (overlaps with RFA & 100-foot Buffer Zone)	240	200	120	1,485	2,045
RFA (inner 100-foot Riparian zone & 100-foot Buffer Zone)	480	200	120	1,3165	**6,010**

*Temporary impacts are associated with trail grading, puncheon installation, and other trail tread improvements. Temporary work is considered work which will occur within the existing trail footprint. Any work occurring outside the existing trail footprint is considered new, permanent work, quantified in Table 4 below.

Table 4. Location and summary of permanent* proposed trail maintenance activity, Mill Pond Trail, Wells State Park, Sturbridge, MA

Permanent Resource Impacts* (square feet)	Drain Dips	Large Puncheon (at S3)	Wheelchair Rest Area	Small Puncheon (at W2)	Trail Tread Regrading Area	Total Disturbance
BVW	0	0	0	0	0	0
Bank	0	0	0	0	0	0
BLSF	0	0		0		0
25-foot Buffer Zone (overlaps with RFA & 100-foot Buffer Zone)	20	0	15	0	0	35
RFA (inner 100-foot Riparian zone & 100-foot Buffer Zone)	40	0	15	0	0	**55**

*Permanent impacts are associated with trail widening for drain dips (maximum of 40 sf) and a wheelchair rest area (15 sf). These areas will remain pervious, and no new structures are proposed.

Each of these are described in more detail in this section.

5.1 Trail Maintenance and Improvements

Sections of the Mill Pond Trail currently cross through vegetated wetland and over streams (Figure 4, Appendix A, and Photo 5, Appendix B). DCR proposes to upgrade selected sections of the trail by removing debris and encroaching trailside vegetation, top dress areas of exposed geofabric with new crushed stone, install puncheon to protect resource areas, install drainage improvements to restore areas of erosion and protect down gradient resource areas (drain dips) (see Photo 8, Appendix B), and install decking over an existing crossing to meet accessibility standards. Work associated with the puncheon does not constitute new resource area impact as those will occur directly over the existing trail footprint. The proposed drain dips will constitute new impacts and occur in RFA and buffer zone; however, the purpose of the drainage improvements is to improve water quality and reduce sedimentation to down gradient resource areas.

The proposed puncheon at Wetland W2 will reduce soil compaction, reduce erosion potential, and protect resource areas. The new wood puncheon will be 6-feet long by 3-feet wide (to meet accessibility standards). The trail improvements along this section constitute an improvement over the existing conditions, where under existing conditions soil compaction are occurring within the BVW (W2-wetland) due to trail braiding. Trail braiding occurs when the trail becomes saturated or wet, and hikers will walk around the designated trail to avoid getting their feet wet. As a result, soil compaction and vegetation compaction have become evident. The improvements will reduce this by adding puncheon this small section (approximately 6 linear feet), which encourages trail users to stay on trial and avoid trampling the wetlands.

The second area of puncheon proposed is located at Wetland W3 and Stream S3 where an existing stone wall bridges across the stream (see Photo 5, Appendix B). No changes to this crossing are proposed other than new decking on top of the existing trail to meet accessibility standards. The puncheon crossing would span the stream Banks. As stated in the Plan notes (see Appendix A), the bridge will span 1.2 times the width of the stream's average bankfull width. Therefore, no impacts are proposed.

Puncheons are typically constructed with wooden decking boards on top of 6-inch by 6-inch by 3-foot wooden "sills." These sills are what make direct contact with the ground. Therefore, the puncheons are proposed to be installed approximately 6-inches above the ground. Puncheons are typically used when the trail traverses through soil that can become saturated and are installed to reduce soil compaction due to passive recreation. In addition, puncheons can be utilized to prevent further erosion towards the wetland over time and to discourage foot traffic off the planned trail. This section of proposed trail can be viewed on Figures 2 and 4 (Appendix A).

Trail drainage improvements are proposed in areas where there is evidence of channeling and erosion within the existing trail. The drain dips will control and direct stormwater flow away from downgradient resource areas. In some areas of the existing trail, spot grading is required to reduce this cross slope. At one section of steeper grade, a new 15 square foot resting interval is proposed for wheelchair accessibility.

5.2 Sedimentation and Erosion Control

No soil disturbance within buffer zones will be conducted without first installing proper erosion and sediment controls. DCR grounds maintenance crew will be provided with a copy of the wetland area map. Outside contractors will be informed of any permits and environmentally sensitive areas. Trail

maintenance and improvement activities will be scheduled/phased to minimize exposed soil. Best Management Practices (BMPs) will be used during and after construction. Prior to earth moving activities, erosion control barriers consisting of wattles are proposed along the outer limits of the alteration area. The erosion control barrier will be installed between all resource areas and areas of disturbance and will remain in place until construction activities are complete. All erosion control barriers will remain in place until upgradient surfaces have stabilized and vegetated. Temporary stockpiles will not be placed in or within the resource areas. The DCR will not use haybales (which contain weed seeds), but will use straw bales, straw wattles, silt fencing, or other weed-free erosion controls in lieu of haybales. Netting, which could entrap animals such as snakes, will not be used.

5.3 Operations and Maintenance

The DCR has an existing Operation and Maintenance Plan (OMP; Appendix D). General ongoing maintenance associated with the trail are also listed in the Notes section of the attached Plans (Appendix A). Trail maintenance may include filling of holes and gullies with stone dust, gravel, or wood chips; removal of stones brought up by frost action; trimming of vegetation; removal of downed trees and limbs; installation and repair of fences, signs, and litter receptacles; and occasional painting of directional arrows for runners. It also includes installation and repair of small stone drains, where surface water would otherwise wash across the path and move sediment. Maintenance of unpaved trails may be exempt under the WPA or may meet the definition of a minor activity in buffer zone and RFA (310 CMR 10.02(2)(b)2.a) and does not constitute an alteration.

Stormwater runoff tends to concentrate leaves, sediment, and debris at the end of swales and at the inverts and outlets of culverts and pipes. These accumulations are routinely removed in order to keep swales and culverts clear, so that stormwater does not seek new flow paths and cause erosion or cause flooding. Occasionally, debris or driftwood may become lodged in streams. This debris tends to accumulate more debris and form blockages. Such material may be removed from the water or Bank in order to preserve free-flowing conditions. The material removed is transported to an upland disposal location. DCR proposes the ongoing cleaning of swales and culverts and removing debris from streams, as needed.

Existing culverts under roadways and paths vary from very old stone culverts to small plastic pipes to larger corrugated steel or reinforced concrete pipes. When culverts fail, the result may lead to erosion of adjacent resource areas such as Bank, flooding of pathways, roads, parking lots or sedimentation of wetlands. Whenever possible, culverts with broken or eroded ends will be repaired. Similarly, areas that have been subject to sediment accumulation may be cleaned out. All culvert work will be performed with appropriate erosion and sedimentation controls. Culvert replacements may require new permitting however, and prior notice would be provided to the Conservation Commission.

6.0 REGULATORY COMPLIANCE

Proposed work which is subject to the WPA as well as the Bylaw must demonstrate how they comply with the general provisions and applicable performance standards. The following tables provide a detailed overview of the general provisions and performance standards under the WPA and Bylaw.

Since the proposed trail maintenance and upgrades will impact only RFA, the following tables describe how the project complies with the general provisions at 310 CMR 10.03 (Table 5) and 10.53 (Table 6) as well as the Sturbridge Wetlands Regulations Bylaw Statement of Jurisdiction (Table 7) and the performance standards for RFA at 310 CMR 10.58 and the Sturbridge Wetlands Bylaw Section III §365-5.5 (Table 8).

6.1 General Provisions and Performance Standards

Table 5. General Provisions of the Wetlands Protection Act (310 CMR 10.03)

Citation	Regulation	Compliance
310 CMR 10.03(1)(a)1.	The area is not significant to the protection of any of the interests identified in the WPA.	The project proposes impacts along an existing foot path used by the public. As a result of normal use, the trails have become degraded over time and are in need of repair. The proposed project will not adversely impact adjacent resource areas.
310 CMR 10.03(1)(a)2.	Work within a resource area will contribute to the protection of the interests of the WPA.	The proposed project will ensure the long-term viability of the trails be preventing further degradation of the trails and adjacent resource areas, thereby protecting the interests of the WPA.
310 CMR 10.03(1)(a)3.	Work within the buffer zone will contribute to the protection of the interests of the WPA; except that work that lies both within the riverfront area and within all or a portion of the buffer zone to another resource shall comply with the performance standards for riverfront area.	Proposed impacts within buffer zone are minimal and are necessary to ensure the integrity of the existing trails and protect the interests of the WPA in adjacent resource areas and prevent further degradation.
310 CMR 10.03(1)(b)	Claims of work outside of any jurisdictional area impacting a jurisdictional area must demonstrate the work has had an adverse impact.	Not applicable.
310 CMR 10.03(2)	Credible evidence from a competent source to support the position taken when contesting MassDEP's position.	Not applicable.
310 CMR 10.03(3)	Installation of subsurface sewage disposal systems.	Not applicable. The project does not propose sewage disposal.
310 CMR 10.03(4)	Presumption concerning point-source discharges.	Not applicable. There are no point-source discharges proposed.
310 CMR 10.03(5)	Each resource area is presumed to be significant to the interests of the WPA.	Only RFA is proposed to be impacted by the project. Proposed impacts are minimal and are necessary to ensure the integrity of the existing trails and protect the interests of the WPA in adjacent resource areas and prevent further degradation.
310 CMR 10.03(6)	Presumption concerning the application of herbicides.	Not applicable. The project does not propose the application of herbicides.
310 CMR 10.03(7)(a)	Filing fees for NOIs pursuant to the WPA.	Filing fees are included in Appendix C

Table 6. General Provisions of Inland Resources Areas (310 CMR 10.53)

Citation	Regulation	Compliance
310 CMR 10.53(1)	Significance of resource areas with no presumptions.	Not applicable. There are no resource areas without presumptions.
310 CMR 10.53(2).	Sites subject to Restriction Orders.	Not applicable. There are no Restriction Orders in place for the Site.
310 CMR 10.53(3).	Limited projects	Not applicable. The project is not proposed as a limited project.
310 CMR 10.53(4)	Ecological restoration limited projects.	Not applicable. The project is not proposed as an ecological restoration project.
310 CMR 10.53(5)	Limited projects supporting existing agriculture and reconstruction or construction of certain water dependent projects.	Not applicable. The project is not proposed as a limited project.
310 CMR 10.53(6)	Limited projects for access to Riverfront Area.	Not applicable. The project is not proposed as a limited project.
310 CMR 10.53(7)	Operation and maintenance plans for public or private infrastructure.	Not applicable. The project does not propose any public or private infrastructure.
310 CMR 10.53(8)	Stream crossings.	Not applicable. There are not stream crossings proposed.

Table 7. Sturbridge Wetlands Regulations Bylaw - Statement of Jurisdiction (Article I §365-1.1)

Citation	Regulation	Compliance
§365-1.1(F)	The minimum strip of continuous undisturbed vegetative cover for any and all resource areas is 25 feet from the outermost edge of the resource area in all directions. The 25 foot buffer zone is to be considered a no-touch buffer	As this work is intended to improve water quality of downgradient resource areas and will remain pervious, no new structures are proposed (such as impervious surfaces, land development, or infrastructure, for example), and no trees are proposed to be removed, we request the Commission consider this a resource area improvement to existing conditions associated with a recreational trail.
§365-1.1(G)(1) and (2)	Waivers	Owing to circumstances relating to existing soil conditions and topography within selected portions of the existing trail, erosion is occurring affecting downgradient resource areas. Left as is, conditions will worsen. The purpose of the proposed drain dips is to improve drainage, erosion, and nearby resource areas. As these select areas are already 'disturbed' (trail) and this proposal is intended to improve the protection of resource areas, we propose there will no significant adverse impacts to resource areas as a result of the drain dips (see also §365-4.13). As the 1,400-acre parcel is already in conservation, we propose the applicant has met the 2:1 value of resource buffer being altered.
§365-1.3(A)	No Significant Adverse Impacts to Resource Areas	The Commission requires a 25-foot undisturbed vegetated corridor around all resource areas. Proposed work associated with drainage improvements (drain dips) will constitute the placement of stone; however, these areas will remain pervious.

6.2 Riverfront Area

Table 8. General Performance Standards for Riverfront Area (310 CMR 10.58(4)) and Sturbridge Wetlands Bylaw Section III §365-5.5

Citation	Regulation	Compliance
310 CMR 10.58(4)(a)	Protection of other resource areas	See section 6.2. No impacts to the BVW are proposed as part of the trail improvements. Existing impacts to BVW are proposed to be *reduced* as a result of this project, reducing trail braiding and soil compaction for 6 linear feet at Wetland W2.
310 CMR 10.58(4)(b) And §365-5.5(D)(1) Sturbridge Wetlands Bylaw Regulations	Protection of rare species	The Site is within mapped Priority and Estimated Habitat. The project is under concurrent review for compliance with MESA. There are no Potential or Certified Vernal Pools within the Mill Pond Trail Loop.
310 CMR 10.58(4)(c) And §365-5.5(D)(2) Sturbridge Wetlands Bylaw Regulations	Practicable and substantially equivalent economic alternatives	This project work does not benefit the applicant economically in any way. This proposal does not include land development for economic benefit, such as residential or commercial development, and the property is within Conservation Land. The purpose of this maintenance and improvement work is to benefit the public for recreation, an interest protected under the WPA. This trail improvement proposes to reduce existing impacts to jurisdictional resource areas associated with recreational use. Under current conditions, trails traverse through BVW and RFA, leading to soil compaction and erosion. By consolidating trail use to a single path (at puncheon) and improving erosion within RFA, impacts will be reduced.
310 CMR 10.58(4)(d)	No Significant Adverse Impact	We propose there is no significant adverse impact on the RFA as a result of this trail improvement work. The trail system is already in place. No new impervious surface area is proposed, and no loss of compensatory storage is proposed. No trees will be removed. Minor grading is proposed, but this will improve stormwater runoff and water quality of downgradient waters. Stormwater runoff and erosion will be reduced as a result of the trail improvements. No impairment to wildlife habitat features is proposed. No impairment to groundwater or surface water are proposed; the purpose of this trail improvement work is to better protect nearby resource areas while continuing to provide recreational value. Where under existing conditions trail use is creating soil compaction and erosion, the proposed puncheon (over BVW) and crushed stone (Buffer Zone and RFA) will discourage off-trail recreation, will alleviate erosion, and will alleviate soil compaction (at puncheon). Further, we suggest this work may qualify for minor activity (per 310 CMR 10.02(2)(b), as the trail work will not include impervious surface area, such as pavement (see 301 CMR 10.02(2)(b)(1)(a)) but will maintain existing trails within conservation land for recreational use.
310 CMR 10.58(4)(d)1.	Issuing authority may allow the alteration of <5,000 sf or 10% of the RFA within the lot, whichever is greater.	This standard has been met. The total proposed permanent impacts to RFA are a maximum of 55 sf, including ≤40 sf for drainage improvements and 15 sf for a new wheelchair turnaround adjacent to the trail. These will remain pervious. The total RFA within the Mill Pond Trail loop (as pertains to this specific project) are 975,417.1; therefore, the total proposed permanent impacts are 0.005% of the RFA within this *portion* of Wells State Park (we did not calculate the RFA for the entire parcel, only the Mill Pond Trail; therefore, this percentage will be less for the parcel).
310 CMR 10.58(4)(d)1.c.	Proposed work does not impair the capacity of the RFA to provide important wildlife habitat functions.	No trees are proposed to be cleared as a result of these trail improvements. Further, the purpose of the trail improvement proposal is to improve water quality, reduce erosion, and improve

		the interests protected under the Act. There will be no adverse impacts to resource areas or significant wildlife habitat.
310 CMR 10.58(4)(d)1.d	Proposed work shall not impair groundwater or surface water quality by incorporating erosion and sedimentation controls and other measures to attenuate nonpoint source pollution.	Not applicable. There are no non-point source discharges associated with the trail maintenance and improvements. The purpose of the ≤40 sf of permanent RFA impacts associated with drainage improvements is to improve existing drainage conditions.
310 CMR 10.58(4)(d)2.a-d.	Work within the 25-foot RFA shall cause no significant adverse impact	See response to 310 CMR 10.58(4)(d) above.
310 CMR 10.58(4)(d)3.a-b	Issuing authority shall allow the construction of a single-family house, a septic system if no sewer is available, and a driveway	Not applicable.
310 CMR 10.58(4)(d)4.a-c.	Issuing authority may allow the construction of a commercial structure of minimum feasible dimension.	Not applicable.

6.2.1 Riverfront Alternatives Analysis

Project alternatives were evaluated including a No Action Alternative, Alternative 2 (Preferred Alternative), and Alternative 3.

6.2.1.1 ALTERNATIVE 1 - NO ACTION

Under a No Action Alternative the trail would remain as is and the drainage problem would not be improved. Under the No Action Alternative, erosion would continue to occur, sediment would enter downgradient resource areas, and the trail would become eroded, losing accessibility trail use. It is possible that over time the trail would pitch steeply towards downgradient resource areas, leading to a collapse.

6.2.1.2 ALTERNATIVE 2 – PREFERRED ALTERNATIVE

The preferred alternative proposes the least impact to the existing trail system in the short-term and the long-term. A total of four drain dips are proposed in areas where washouts along the trail are occurring (see Photo 8, Appendix B). Each drain drip will be designed to protect downgradient resource areas, including BVW (Wetland W3) and perennial stream (Streams S3/S4).

6.2.1.3 ALTERNATIVE 3 – TRAIL WIDENING AND HARD-ARMOR EROSION CONTROL

It would be possible to widen the trail at select locations cutting into the slope to the north and building (fill) to the south using hard armor such as riprap. This would alleviate the erosion problem and stabilize the trail for accessibility use; however, the impacts to resource areas would be greater than the preferred alternative.

6.3 Compliance with Massachusetts Stormwater Standards

As the proposed trail drainage improvements (maximum of 40 sf) and wheelchair rest area (15 sf) will remain pervious, we are including a checklist to demonstrate compliance with the Massachusetts

Stormwater Standards (Table 9). While there is no specific exemption from the stormwater standards that apply to the project (trail maintenance), by definition the project is not subject to these standards since there is no proposed increase in impervious surface area and the trail maintenance work will not result in any changes to the volume or velocity of stormwater runoff.

Table 9. MA Stormwater Compliance Checklist

Standard	Regulation	Compliance
Standard 1	LID Measures	Not applicable. The drainage improvements (maximum of 40 sf) and wheelchair rest area (15 sf) do not propose any new impervious surface area; therefore, opportunities for the inclusion of new LID measures do not exist.
Standard 2	Peak Rate Attenuation	Met to maximum extent practicable. This trail maintenance and improvement proposal does not include the addition of any impervious surface area that would increase runoff volumes. No changes to drainage patterns are proposed.
Standard 3	Recharge	Met to maximum extent practicable. The project does not propose any alteration to the groundwater recharge rates.
Standard 4	Water Quality	Met to the maximum extent practicable. Since material storage, potential for spills, or illicit discharges, etc., do not exist, the development of a Pollution Prevention Plan or the inclusion of BMPs are not applicable. No fertilizers, pesticides, herbicides, fungicides, road salts, etc. are proposed to be used as part of this trail maintenance and improvement plan.
Standard 5	Land Use with Higher Potential Pollutant Loads (LUHPPLs)	Not applicable.
Standard 6	Critical Areas	Not applicable.
Standard 7	Redevelopments and Other Projects Subject to Standards to the Maximum Extent Practicable	The project is subject to the Stormwater Management Standards only to the maximum extent practical as a foot path (existing trail).
Standard 8	Construction Period Pollution Prevention and Erosion and Sedimentation Control	This project does not require a National Pollution Discharge Elimination System (NPDES) Construction General Permit as the footprint is below the thresholds.
Standard 9	Operation and Maintenance Plan	A copy of the DCR Operation and Maintenance Plan is included in Appendix D.
Standard 10	Prohibition of Illicit Discharges	There are no point source discharges associated with this trail improvement and maintenance.

A Stormwater Checklist is included in Appendix E.

7.0 SUMMARY

On behalf of the DCR, SWCA has prepared this Streamlined MESA/NOI application for trail maintenance and trail improvements at the Mill Pond Trail Loop located in the Town of Sturbridge, Massachusetts. Trail maintenance work will occur within portions of RFA and within the 100-foot buffer-zone to jurisdictional resource areas; however, impacts are only proposed within the RFA and 100-foot buffer zone. These areas are jurisdictional under the WPA and under the Bylaw. This proposed trail maintenance activity does not propose to alter resource areas or alter the existing conditions. New wood puncheon is proposed at portions of existing trails which traverse through wet areas in order to alleviate soil compaction and trail braiding. A second wood puncheon is proposed to be installed at an existing stream crossing. Neither puncheon will constitute new impacts as the puncheon will be placed directly

over the existing trail. No impervious surface area is proposed within resource areas. We are seeking approval by the Sturbridge Conservation Commission to complete this trail maintenance and improvement activity.

8.0 REFERENCES CITED/LITERATURE CITED

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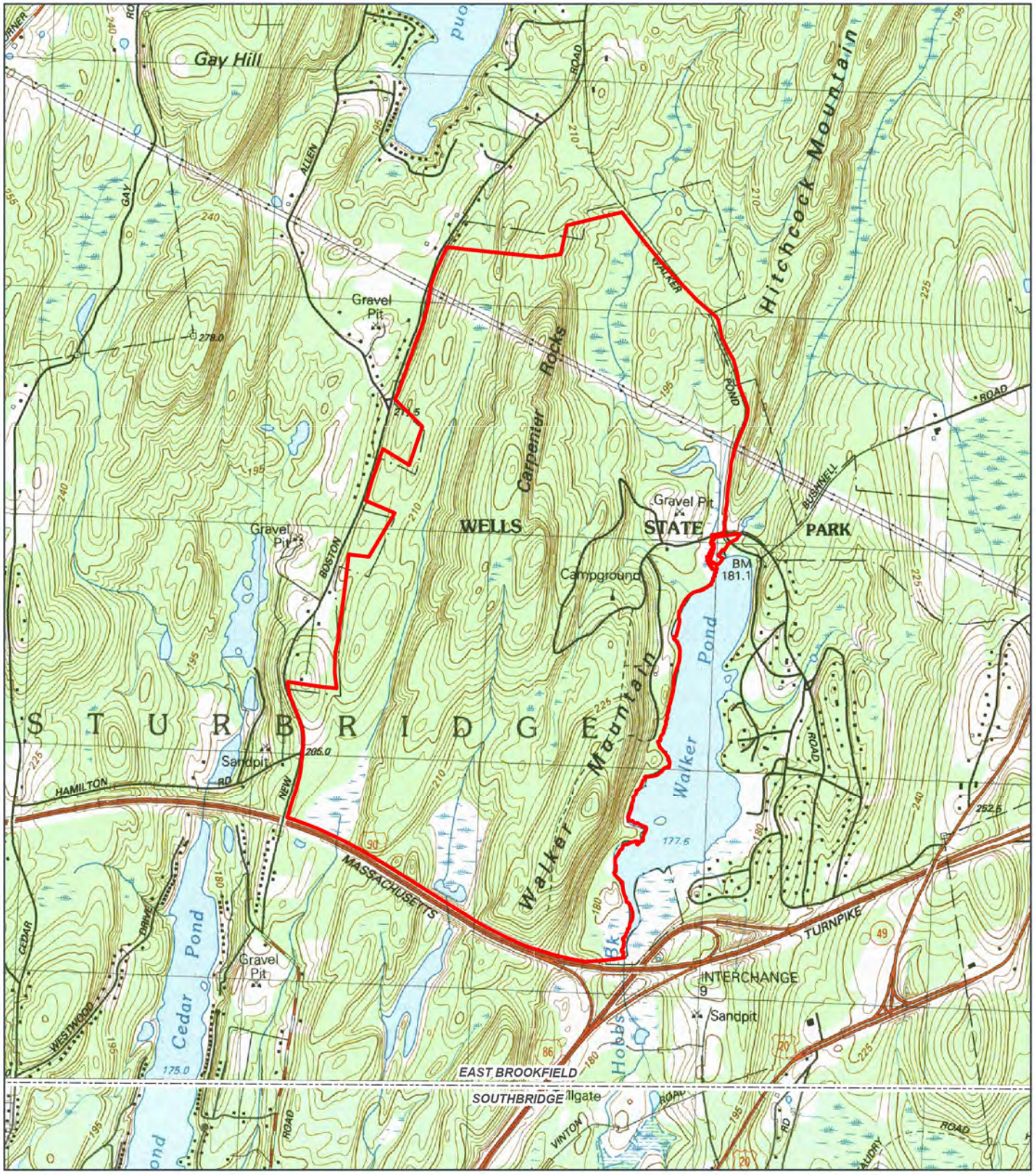
APPENDIX A

Figures and Site Plans



Wells State Park Parcel

USGS Quadrangle Boundary

Sturbridge
Worcester County, MA
USGS 7.5' Quadrangle:
East Brookfield, MA, 42072-B1
NAD 1983 2011 StatePlane
Massachusetts Mnld
FIPS 2001 FtUS
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Base Map: ESRI ArcGIS Online, accessed March 2023

Updated: 3/9/2023
Project No. 72861
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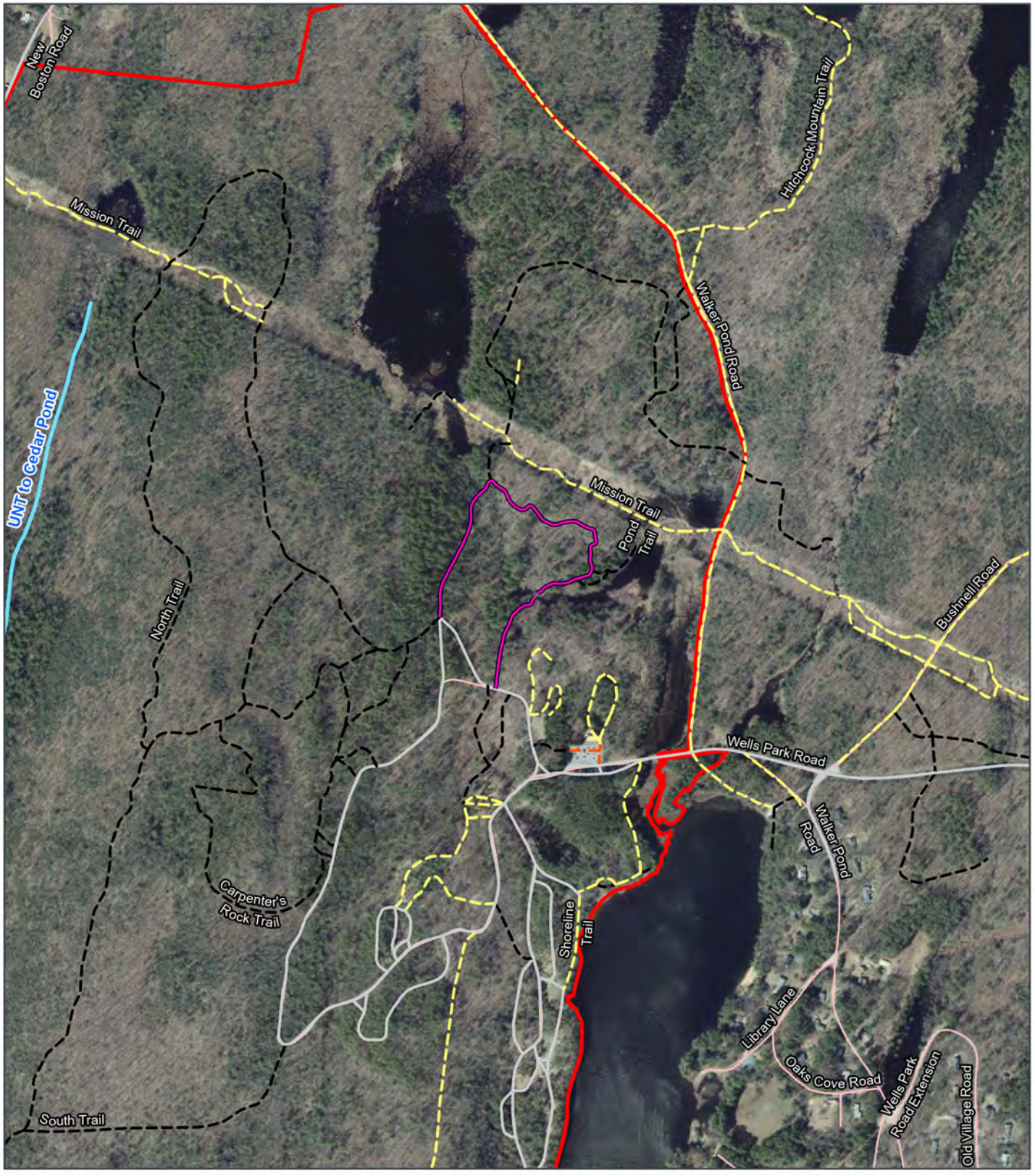
SWCA
ENVIRONMENTAL CONSULTANTS



Road
Mill Pond Trail Loop
MADFW Coldwater Fisheries Resources
Wells State Park Parcel

DCR Roads/Trails

Forest Road/Trail
Other
Public Road
Trail

SWCA ENVIRONMENTAL CONSULTANTS

Sturbridge
Worcester County, MA
USGS 7.5' Quadrangle:
East Brookfield, MA, 42072-B1
NAD 1983 2011 StatePlane
Massachusetts Mnld
FIPS 2001 FtUS
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Base Map: ESRI ArcGIS Online, accessed March 2023

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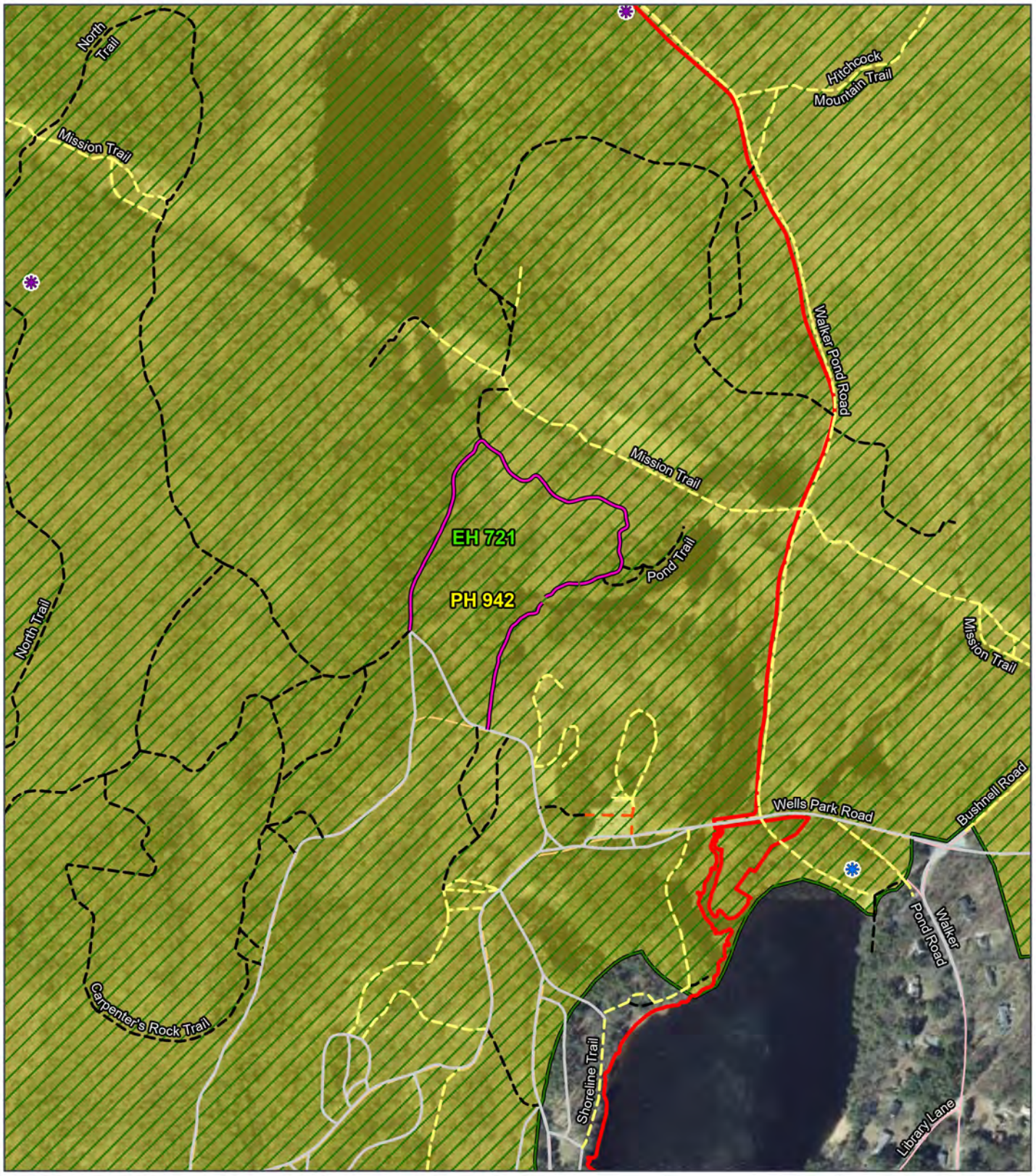

NHESP Certified Vernal Pools (MassGIS 2023)

NHESP Potential Vernal Pool (MassGIS, 2023)

Road

DCR Roads/Trails

Forest Road/Trail

Other

Public Road

Trail

Mill Pond Trail Loop

NHESP Priority Habitat of Rare Species (MassGIS, 2021)

NHSEP Estimated Habitat of Rare Species (MassGIS, 2021)

Wells State Park Parcel

Sturbridge
Worcester County, MA
USGS 7.5' Quadrangle:
East Brookfield, MA, 42072-B1
NAD 1983 2011 StatePlane
Massachusetts Mnld
FIPS 2001 FtUS
72.0624°W 42.1495°N

Base Map: ESRI ArcGIS Online, accessed March 2023

Updated: 3/15/2023
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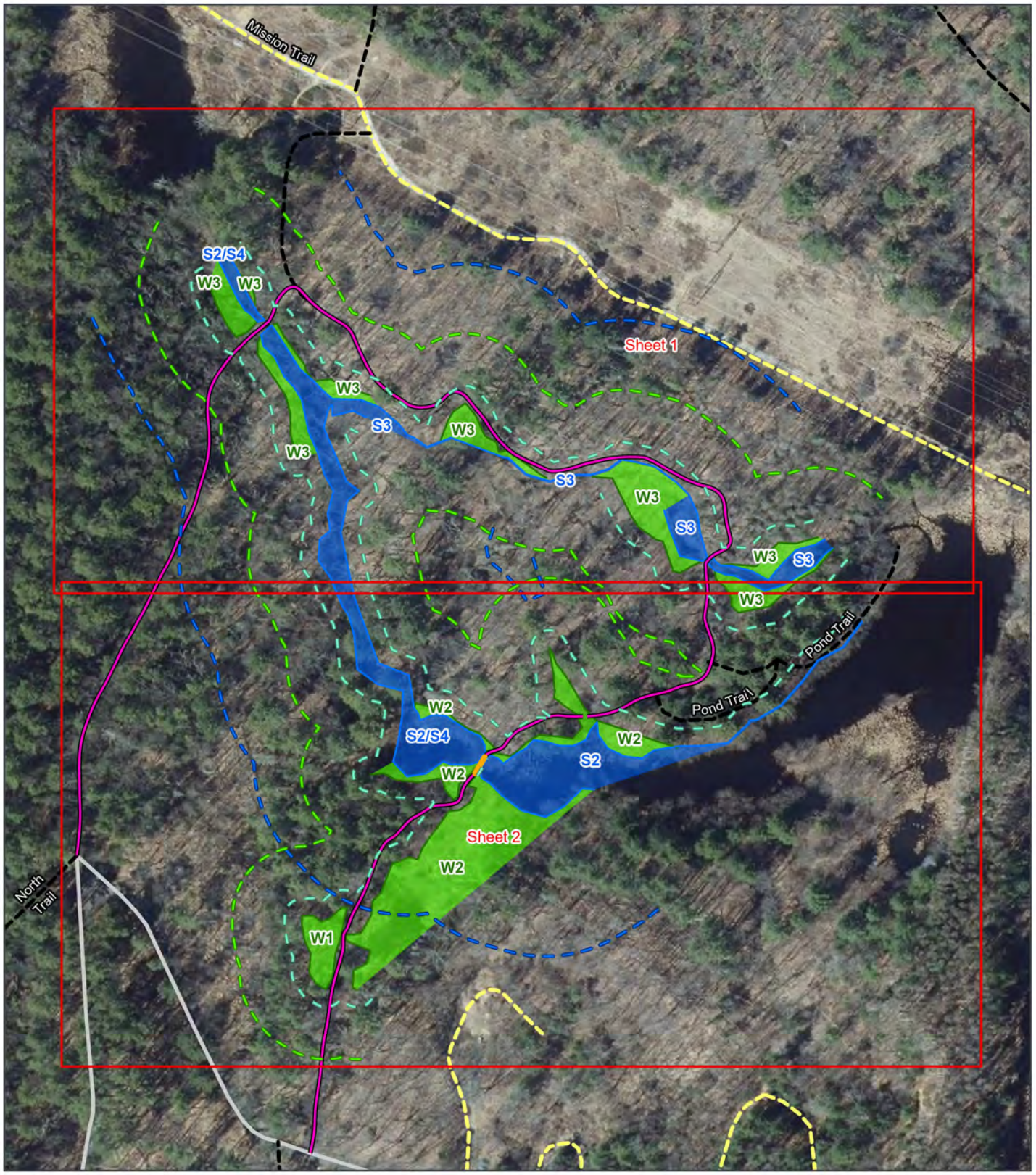
SWCA
ENVIRONMENTAL CONSULTANTS



25-foot Buffer Zone
100' Wetland Buffer
200' Riverfront Area
Delineated Stream Line
Delineated Wetland Line

Existing Bridge
Mill Pond Trail Loop
Forest Road/Trail
Public Road
Trail

Perennial Stream
Bordering Vegetated Wetland
Map Sheet Index

Sturbridge
Worcester County, MA
USGS 7.5' Quadrangle:
East Brookfield, MA, 42072-B1
NAD 1983 2011 StatePlane
Massachusetts Mnld
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Base Map: ESRI ArcGIS Online, accessed March 2023

Updated: 3/16/2023
Project No. 72861
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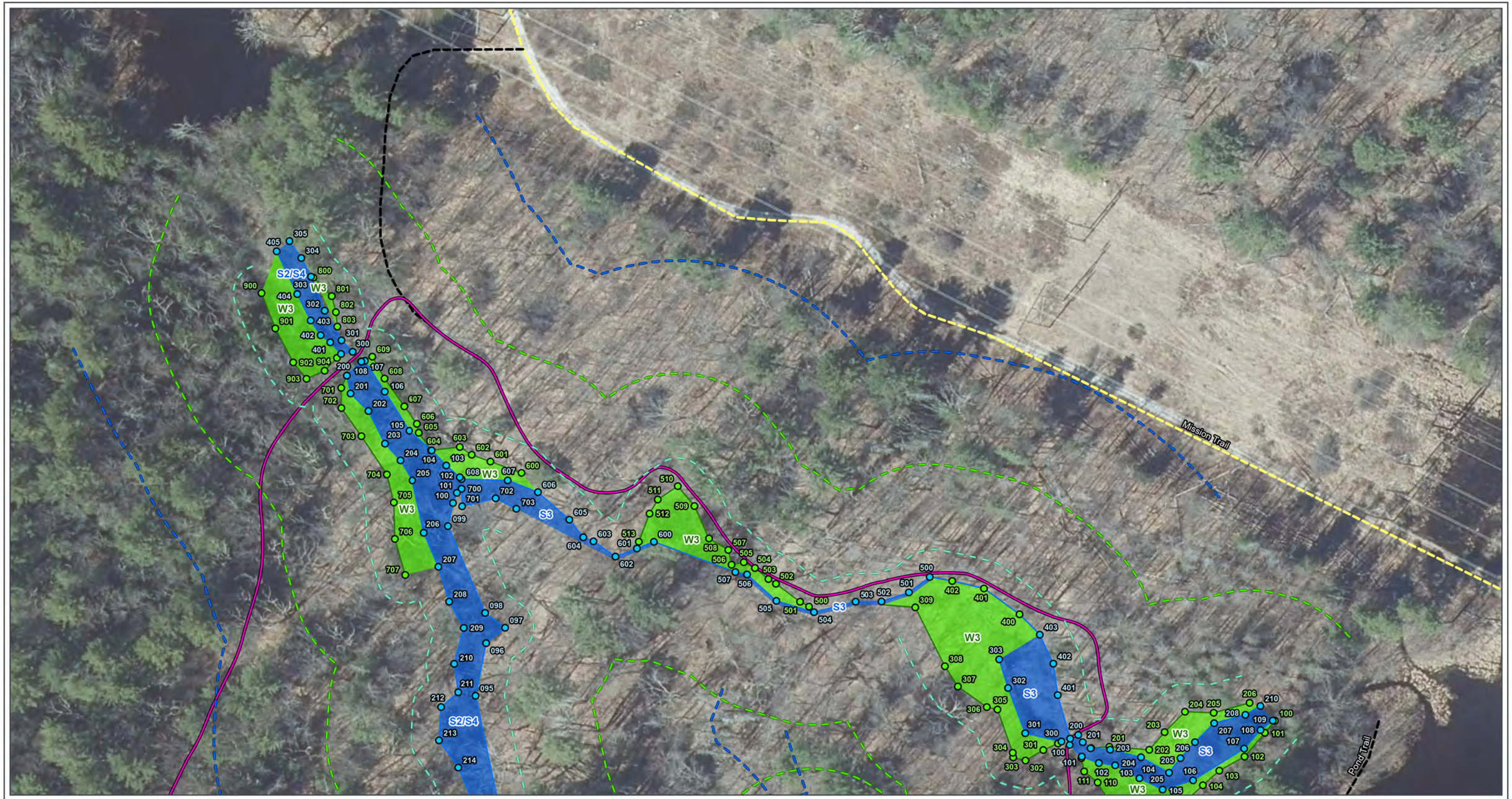
SWCA
ENVIRONMENTAL CONSULTANTS



Waterbody Flag
Wetland Flag
25-foot Buffer Zone
100-foot Wetland Buffer
200-foot Riverfront Area

Delineated Stream Line
Delineated Wetland Line

DCR Roads/Trails
Forest Road/Trail
Trail

Mill Pond Trail Loop
Perennial Stream
Bordering Vegetated Wetland

SWCA ENVIRONMENTAL CONSULTANTS

Sturbridge,
Worcester County, MA
USGS 7.5' Quadrangle:
East Brookfield, MA, 42072-B1
NAD 1983 2011 StatePlane
Massachusetts Mnld
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SHEET 1 of 2

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Updated: 3/16/2023
Project No. 72861
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0 50 100 Feet
0 10 20 Meters

Waterbody Flag
Wetland Flag
25-foot Buffer Zone
100-foot Wetland Buffer

200-foot Riverfront Area
Delineated Stream Line
Delineated Wetland Line
Existing Bridge

DCR Roads/Trails
Forest Road/Trail
Public Road
Trail

Mill Pond Trail Loop
Perennial Stream
Bordering Vegetated Wetland

SWCA ENVIRONMENTAL CONSULTANTS

Sturbridge,
Worcester County, MA
USGS 7.5' Quadrangle:
East Brookfield, MA, 42072-B1
NAD 1983 2011 StatePlane
Massachusetts Mnld
FIPS 2001 FtUS
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Project No. 72861
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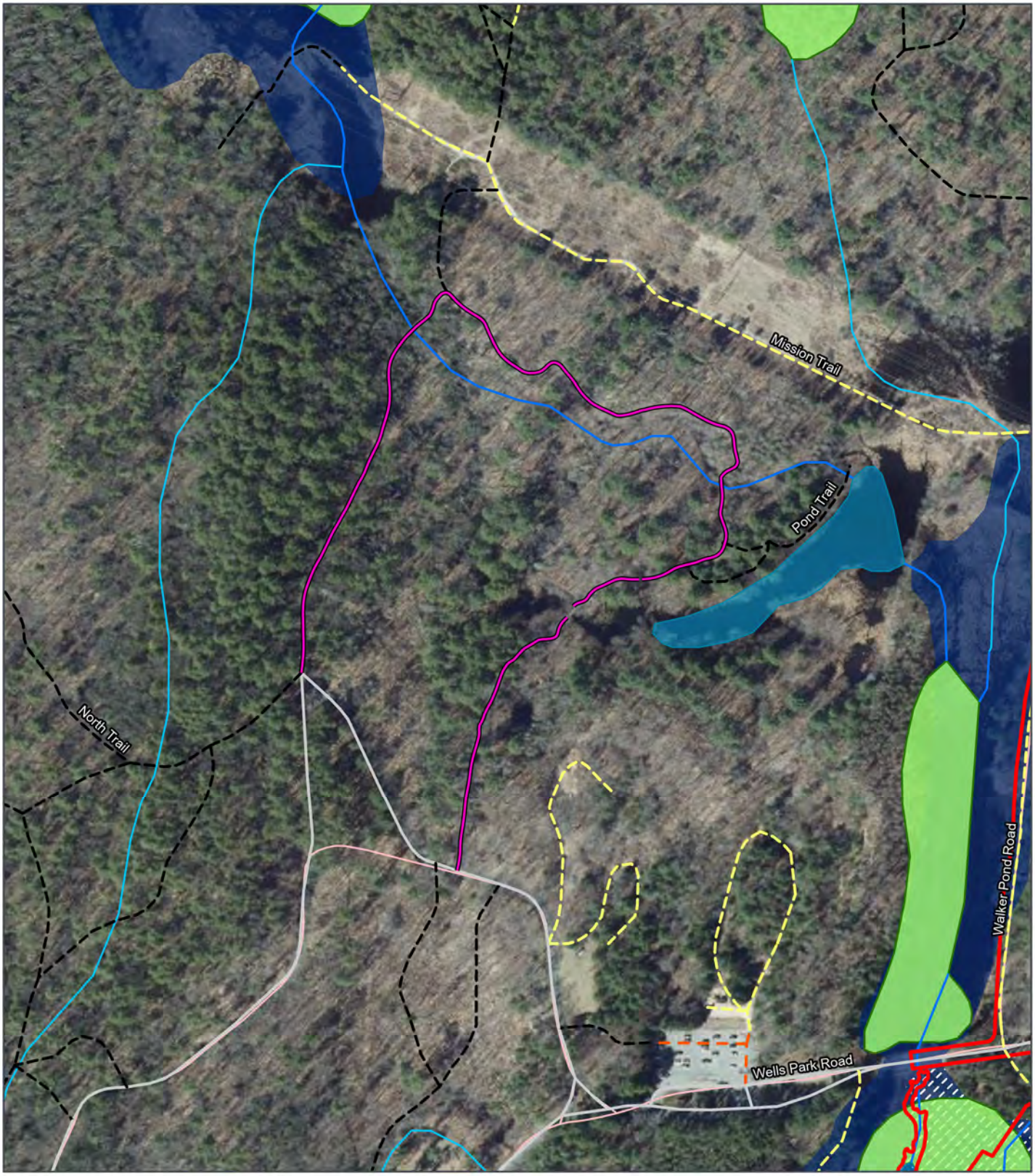
SHEET 2 of 2

0 50 100 Feet
0 10 20 Meters



DCR Roads/Trails
- Forest Road/Trail
- Other
- Public Road
- Trail
- Road
- Mill Pond Trail Loop
- Wells State Park Parcel
- FEMA 100-year Flood Zone
- Floodway

MassDEP Hydrography
- Stream
- Intermittent Stream
- Wetland, Marsh, Swamp, Bog
- Lake, Pond, Wide River, or Impoundment

Sturbridge
Worcester County, MA
USGS 7.5' Quadrangle:
East Brookfield, MA, 42072-B1
NAD 1983 2011 StatePlane
Massachusetts Mnld
FIPS 2001 FtUS
72.0624°W 42.1495°N

Base Map: ESRI ArcGIS Online, accessed March 2023

Updated: 3/15/2023
Project No. 72861
File: 06_Flood_Wells

N

1:3,600

0 100 200 Feet
0 40 80 Meters

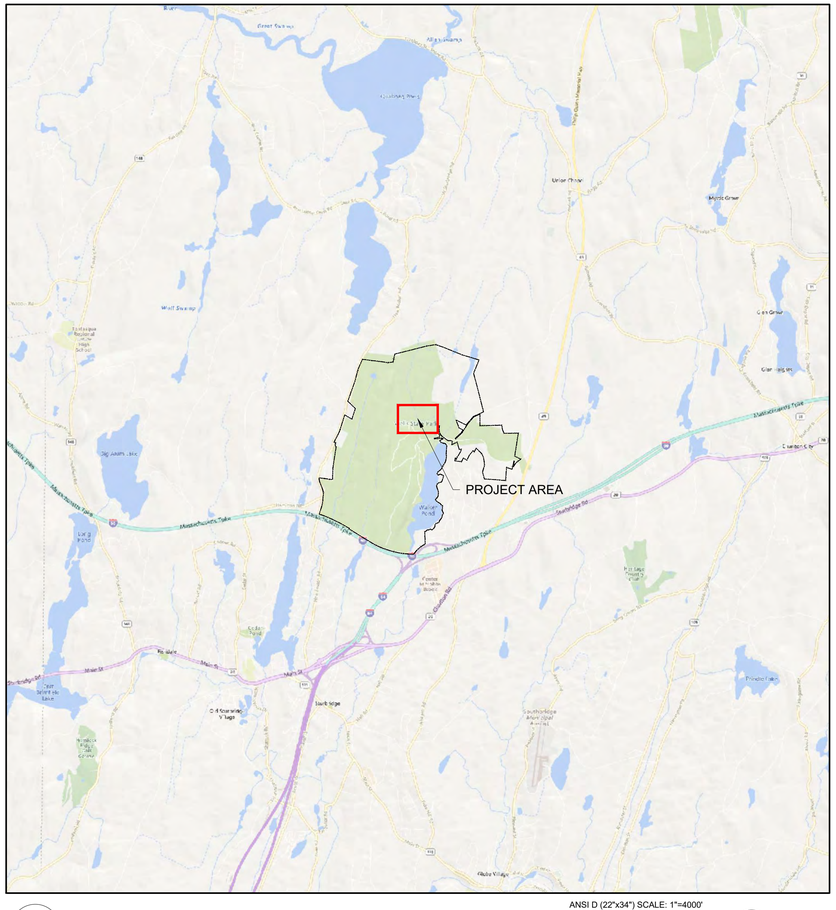
SWCA
ENVIRONMENTAL CONSULTANTS

WELLS STATE FOREST TRAIL RESTORATION PLAN SET

159 WALKER POND ROAD

STURBRIDGE, MASSACHUSETTS

APRIL 3, 2023



1 LOCUS MAP/ USGS

LOCUS MAP SOURCE: AUTODESK INTEGRATED MICROSOFT TOM TOM GEOREFERENCED MAPPING TOOL (REFERENCED 2021)

ANSI D (22"x34") SCALE: 1"=4000'
TABLOID (11"x17") SCALE: 1"=8000'
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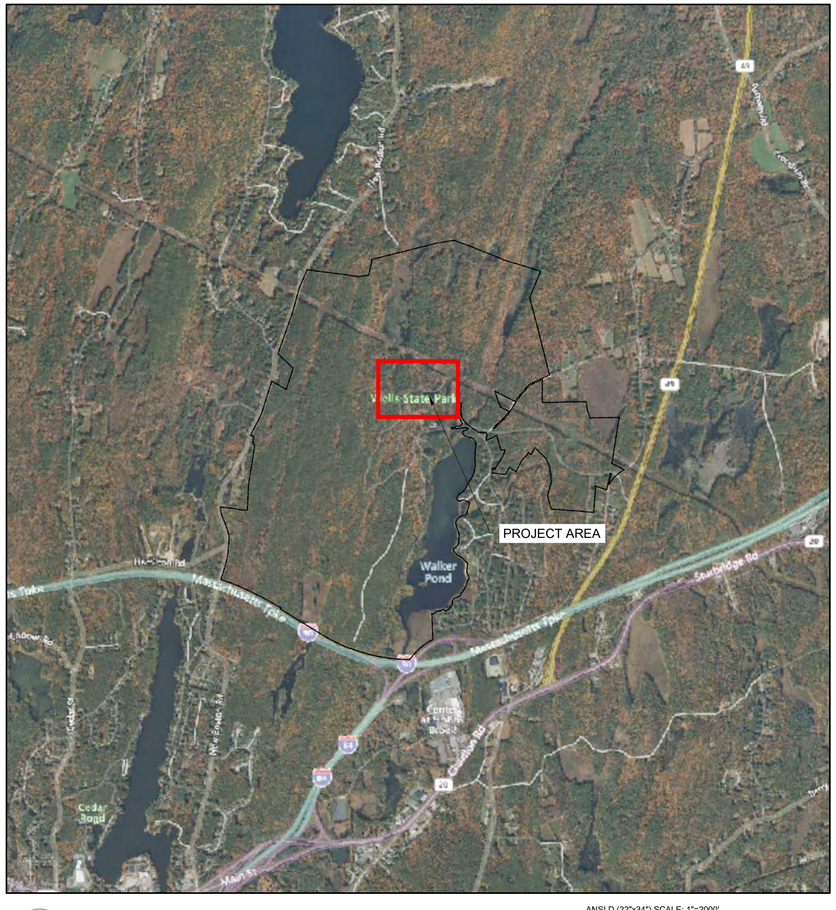

2 ORTHO-PHOTOGRAPH

BASE MAP SOURCE: AUTODESK INTEGRATED MICROSOFT DIGITALGLOBE ORTHO IMAGERY (REFERENCED 2021)

ANSI D (22"x34") SCALE: 1"=2000'
TABLOID (11"x17") SCALE: 1"=4000'
0 1000 2000 4000

SHEET INDEX

Prepared by:

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Prepared for:

MASSACHUSETTS DEPARTMENT OF CONSERVATION AND RECREATION

Greenways and Trails Program
136 Damon Road
Northampton, Massachusetts 01060

Locus Map:

Legend:

Stamp:

Project Title:

DCR 837

WELLS STATE FOREST

ACCESSIBLE TRAIL
IMPROVEMENTS AND MAINTENANCE

Sheet Title:

COVER

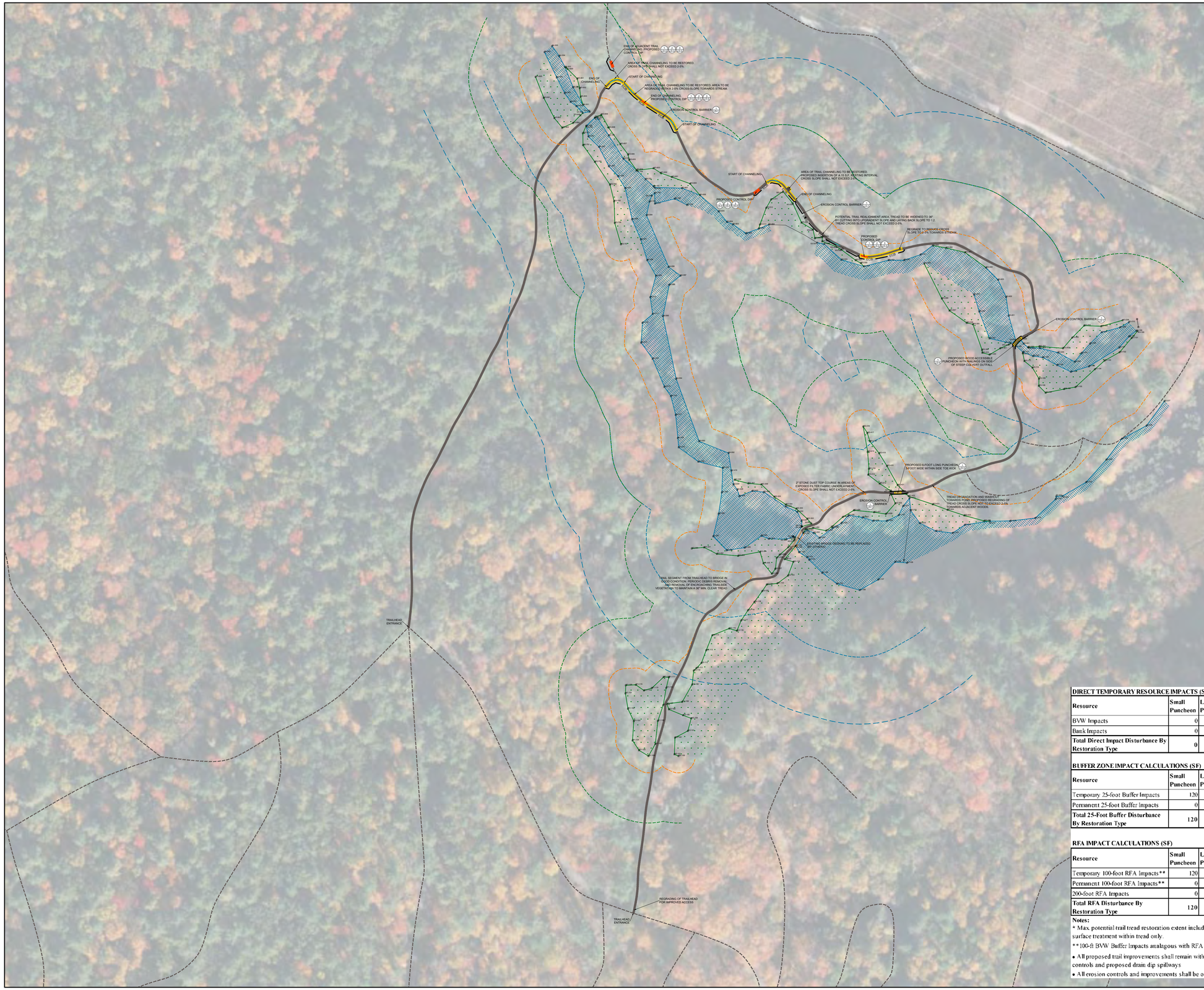
Date:	04/03/2023
Scale:	As Shown
Drawn by:	TS
Checked by:	CB
File #	72861.00

REVISIONS

Date:	By:	Note:

Sheet No:

LP-0



NOTES:

1. TO THE EXTENT PRACTICABLE, THIS TRAIL LOOP SHALL CONFORM TO THE MOST CURRENT USDA FSTAG GUIDELINES (SEE SHEET 1.5).
2. THE CLEAR TREAD WIDTH OF THIS TRAIL LOOP SHALL BE MAINTAINED AT 36 INCHES MIN.
3. TO THE EXTENT PRACTICABLE, NO TRAIL SEGMENT SHALL HAVE A RUNNING SLOPE OR CROSS SLOPE IN EXCESS OF 5 PERCENT.
4. ALL TRAIL SEGMENTS TO BE CLEARED OF DEBRIS.
5. BRIDGE STRUCTURES CROSSING STREAMS SHALL HAVE FOOTERS PLACED A MINIMUM OF 1.2 TIMES THE BANKFULL WIDTH.
8. ALL CONSTRUCTED TRAIL FEATURES, SUCH AS BRIDGES AND PUNCHEONS, SHALL ADHERE TO THE SAME STANDARDS AS THE TRAIL TREAD, I.E., TRAIL WIDTH AND GRADE.
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12. ALL WORK IN REGULATED RESOURCE BUFFERS HAVE HAVE SUFFICIENT EROSION CONTROLS.
13. ALL EROSION CONTROLS SHALL BE PLACED OUTSIDE OF RESOURCE AREAS.

DIRECT TEMPORARY RESOURCE IMPACTS (SF)

Resource	Small Puncheon	Large Puncheon	Drain Dips	Identified Trail Tread Regrading Area	Total Disturbance	Max. Potential Trail Tread Restoration*
BVW Impacts	0	0	0	0	0	0
Bank Impacts	0	0	0	0	0	0
Total Direct Impact Disturbance By Restoration Type	**0**	**0**	**0**	**0**	**0**	

BUFFER ZONE IMPACT CALCULATIONS (SF)

Resource	Small Puncheon	Large Puncheon	Drain Dips	Identified Trail Tread Regrading Area	Total Disturbance	Max. Potential Trail Tread Restoration*
Temporary 25-foot Buffer Impacts	120	200	240	1,485	2,045	1,222
Permanent 25-foot Buffer Impacts	0	0	20	15	35	1,222
Total 25-Foot Buffer Disturbance By Restoration Type	**120**	**200**	**260**	**1,500**	**2,080**	

RFA IMPACT CALCULATIONS (SF)

Resource	Small Puncheon	Large Puncheon	Drain Dips	Identified Trail Tread Regrading Area	Total Disturbance	Max. Potential Trail Tread Restoration*
Temporary 100-foot RFA Impacts**	120	200	480	3,165	6,010	2,026
Permanent 100-foot RFA Impacts**	0	0	40	15	55	0
200-foot RFA Impacts	0	0	0	0	0	345
Total RFA Disturbance By Restoration Type	**120**	**200**	**520**	**3,180**	**6,065**	

Notes:

* Max. potential trail tread restoration extent includes all existing trail area within regulated areas. Restoration consists of surface treatment within tread only.

**100-ft BVW Buffer Impacts analagous with RFA impacts

- All proposed trail improvements shall remain within the footprint of the trail tread, with the exception of temporary erosion controls and proposed dram dip spillways
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Prepared for:

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Greenways and Trails Program
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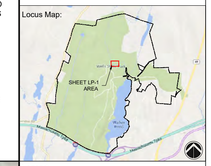
Northampton, Massachusetts 01060

Locus Map:



Legend:

- PROPERTY LINES
- MAJOR CONTOUR (5' INTERVAL)
- MINOR CONTOUR (1' INTERVAL)
- BORDERING VEGETATED WETLAND
- STREAM
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- BRIDGE STRUCTURE
- FOCUS RESTORATION AREA
- PROPOSED DIP DRAIN
- EROSION CONTROL BARRIER

ANSI D (22"x34") SCALE: 1"=70'
TABLOID (11"x17") SCALE: 1"=140'

0 35 70 140

Stamp:

Project Title:

DCR 837

WELLS STATE FOREST

ACCESSIBLE TRAIL IMPROVEMENTS AND MAINTENANCE

Sheet Title:

RESTORATION OVERVIEW PLAN

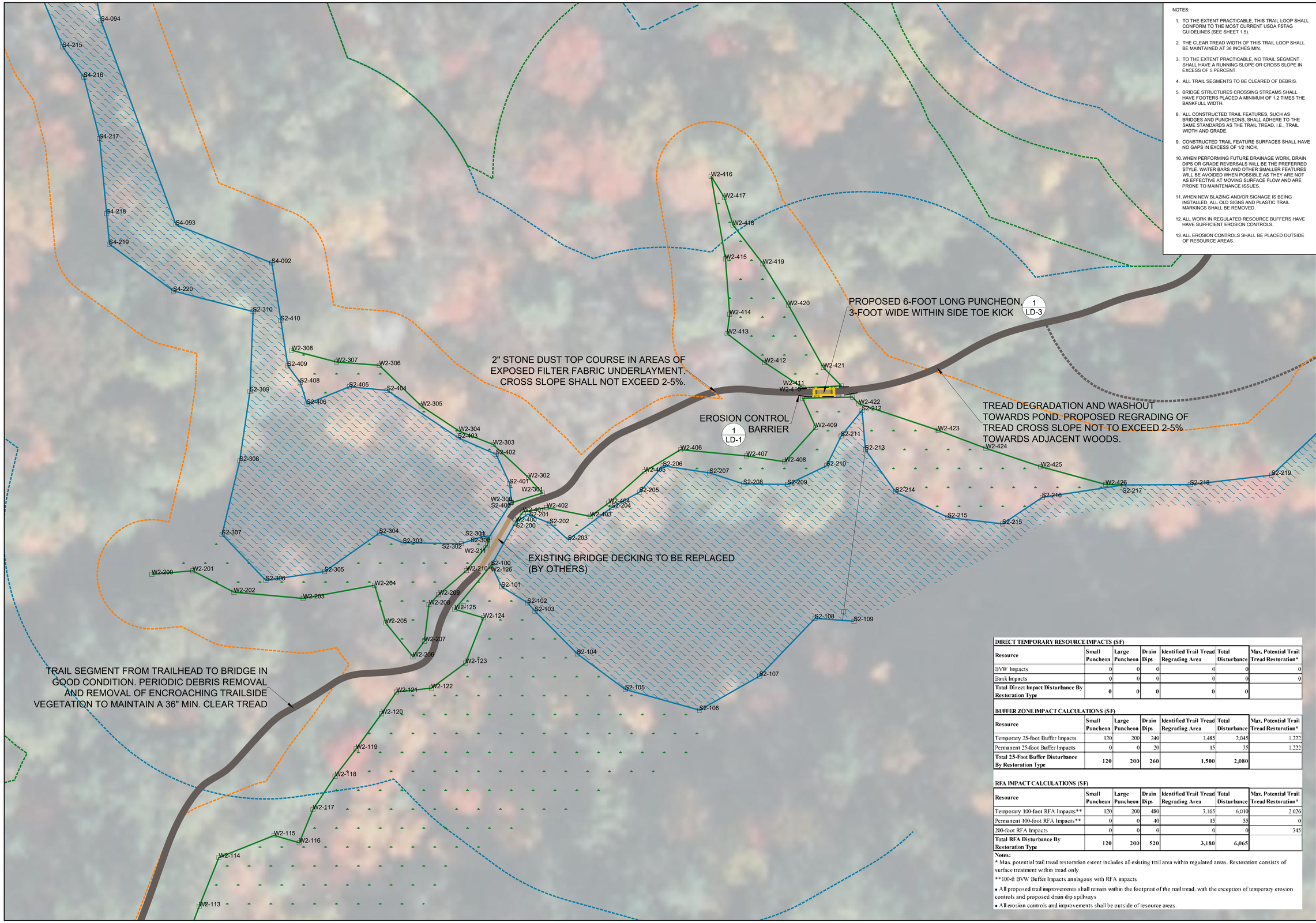
Date:	04/03/2023
Scale:	As Shown
Drawn by:	TS
Checked by:	CB
File #	72861.00

REVISIONS

Date:	By:	Note:

Sheet No:

LP-1



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DIRECT TEMPORARY RESOURCE IMPACTS (SF)

Resource	Small Puncheon	Large Puncheon	Drain Dips	Identified Trail Tread Regrading Area	Total Disturbance	Max. Potential Trail Tread Restoration*
BVW Impacts	0	0	0	0	0	0
Bank Impacts	0	0	0	0	0	0
Total Direct Impact Disturbance By Restoration Type	**0**	**0**	**0**	0	**0**	

BUFFER ZONE IMPACT CALCULATIONS (SF)

Resource	Small Puncheon	Large Puncheon	Drain Dips	Identified Trail Tread Regrading Area	Total Disturbance	Max. Potential Trail Tread Restoration*
Temporary 25-foot Buffer Impacts	120	200	240	1,485	2,045	1,222
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200-foot RFA Impacts	0	0	0	0	0	345
Total RFA Disturbance By Restoration Type	**120**	**200**	**520**	**3,180**	**6,065**	

Notes:
* Max. potential trail tread restoration extent includes all existing trail area within regulated areas. Restoration consists of surface treatment within tread only.
**100-ft BVW Buffer Impacts analagous with RFA impacts
- All proposed trail improvements shall remain within the footprint of the trail tread, with the exception of temporary erosion controls and proposed drain dip spillways
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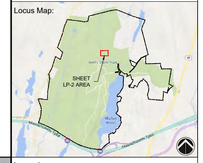
Locus Map:



Legend:

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- MAJOR CONTOUR (5' INTERVAL)
- MINOR CONTOUR (1' INTERVAL)
- BORDERING VEGETATED WETLAND
- STREAM
- 25-FOOT NO DISTURBANCE BUFFER
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- 100-FOOT RIVERFRONT BUFFER
- 200-FOOT RIVERFRONT BUFFER
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- SECONDARY TRAIL (NON-REST.)
- BRIDGE STRUCTURE
- FOCUS RESTORATION AREA
- PROPOSED DIP DRAIN
- EROSION CONTROL BARRIER

ANSI D (22"x34") SCALE: 1"=20'
TABLOID (11"x17") SCALE: 1"=40'

0 20 40 80

Stamp:

Project Title:

DCR 837

WELLS STATE FOREST

ACCESSIBLE TRAIL IMPROVEMENTS AND MAINTENANCE

Sheet Title:

SMALL PUNCHEON AREA RESTORATION PLAN

Date:	04/03/2023
Scale:	As Shown
Drawn by:	TS
Checked by:	CB
File #	72861.00

REVISIONS

Date:	By:	Note:

Sheet No:

LP-2

EROSION CONTROL BARRIER 1 LD-1

POTENTIAL TRAIL REALIGNMENT AREA. TREAD TO BE WIDENED TO 36" BY CUTTING INTO UPGRADIENT SLOPE AND LAYING BACK SLOPE TO 1:2. TREAD CROSS SLOPE SHALL NOT EXCEED 2-5%.

REGRADE TO REDUCE CROSS SLOPE TO 2-5% TOWARDS STREAM.

PROPOSED CONTROL DIP 1 LD-2 2 LD-2 3 LD-2

EROSION CONTROL BARRIER 1 LD-1

PROPOSED WOOD ACCESSIBLE PUNCHEON WITH RAILINGS ON SIDE OF STEEP CULVERT OUTFALL 1 LD-4

PROPOSED 6-FOOT LONG PUNCHEON, 3-FOOT WIDE WITHIN SIDE TOE KICK 1 LD-3

NOTES:

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DIRECT TEMPORARY RESOURCE IMPACTS (SF)

Resource	Small Puncheon	Large Puncheon	Drain Dips	Identified Trail Tread Regrading Area	Total Disturbance	Max. Potential Trail Tread Restoration*
BVW Impacts	0	0	0	0	0	0
Bank Impacts	0	0	0	0	0	0
Total Direct Impact Disturbance By Restoration Type	**0**	**0**	**0**	**0**	**0**	

BUFFER ZONE IMPACT CALCULATIONS (SF)

Resource	Small Puncheon	Large Puncheon	Drain Dips	Identified Trail Tread Regrading Area	Total Disturbance	Max. Potential Trail Tread Restoration*
Temporary 25-foot Buffer Impacts	120	200	240	1,485	2,045	1,222
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RFA IMPACT CALCULATIONS (SF)

Resource	Small Puncheon	Large Puncheon	Drain Dips	Identified Trail Tread Regrading Area	Total Disturbance	Max. Potential Trail Tread Restoration*
Temporary 100-foot RFA Impacts**	120	200	480	3,165	6,010	2,026
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200-foot RFA Impacts	0	0	0	0	0	345
Total RFA Disturbance By Restoration Type	**120**	**200**	**520**	**3,180**	**6,065**	

Notes:
* Max. potential trail tread restoration extent includes all existing trail area within regulated areas. Restoration consists of surface treatment within tread only.
**100-ft BVW Buffer Impacts analagous with RFA impacts

- All proposed trail improvements shall remain within the footprint of the trail tread, with the exception of temporary erosion controls and proposed drain dip spillways
- All erosion controls and improvements shall be outside of resource areas.

Prepared by:

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Prepared for:

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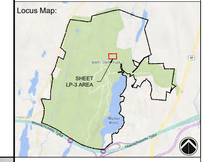
Locus Map:



Legend:

- PROPERTY LINES
- MAJOR CONTOUR (5' INTERVAL)
- MINOR CONTOUR (1' INTERVAL)
- BORDERING VEGETATED WETLAND
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- 25-FOOT NO DISTURBANCE BUFFER
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- SECONDARY TRAIL (NON-REST.)
- BRIDGE STRUCTURE
- FOCUS RESTORATION AREA
- PROPOSED DIP DRAIN
- ECB EROSION CONTROL BARRIER

ANSI D (22"x34") SCALE: 1"=20'
TABLOID (11"x17") SCALE: 1"=40'

0 20 40 80

Stamp:

Project Title:

DCR 837

WELLS STATE FOREST

ACCESSIBLE TRAIL IMPROVEMENTS AND MAINTENANCE

Sheet Title:

RAILED PUNCHEON AREA RESTORATION PLAN

Date:	04/03/2023
Scale:	As Shown
Drawn by:	TS
Checked by:	CB
File #	72861.00

REVISIONS

Date:	By:	Note:

Sheet No:

LP-3

END OF ADJACENT TRAIL CHANNELING. PROPOSED CONTROL DIP (1 LD-2) (2 LD-2) (3 LD-2)

AREA OF TRAIL CHANNELING TO BE RESTORED. CROSS SLOPE SHALL NOT EXCEED 2-5%.

START OF CHANNELING

END OF CHANNELING

AREA OF TRAIL CHANNELING TO BE RESTORED. AREA TO BE REGRADED WITH A 2-5% CROSS-SLOPE TOWARDS STREAM.

END OF CHANNELING. PROPOSED CONTROL DIP (1 LD-2) (2 LD-2) (3 LD-2)

EROSION CONTROL BARRIER (1 LD-1)

START OF CHANNELING

START OF CHANNELING

AREA OF TRAIL CHANNELING TO BE RESTORED. PROPOSED INSERTION OF A 15 S.F. RESTING INTERVAL. CROSS SLOPE SHALL NOT EXCEED 2-5%

END OF CHANNELING

PROPOSED CONTROL DIP (1 LD-2) (2 LD-2) (3 LD-2)

EROSION CONTROL BARRIER (1 LD-1)

POTENTIAL TRAIL REALIGNMENT AREA. TREAD TO BE WI
BY CUTTING INTO UPGRADIENT SLOPE AND LAYING BAC
TREAD CROSS SLOPE SHALL NOT EXCEED 5%

S4-305, S4-405, S4-304, S4-303, W3-800, W3-900, S4-404, W3-801, S4-302, W3-802, S4-403, W3-803, W3-901, S4-402, S4-301, S4-401, S4-300, S4-400, W3-905, W3-902, W3-904, W3-903, W3-609, S4-107, S4-108, S4-200, W3-700, W3-608, W3-701, S4-201, S4-106, W3-607, W3-702, S4-202, W3-606, S4-105, W3-605, W3-703, S4-203, W3-604, S4-104, W3-603, W3-602, S4-204, S4-103, W3-601, W3-704, S4-102, S3-608, S3-607, W3-600, S4-205, S3-700, S3-606, S4-101, S3-702, W3-705, S4-100, S3-701, S3-703, S4-099, S4-206, W3-706, S3-605, S3-604, S3-603, S4-207, W3-707, S4-208, S4-098, S4-209, S4-097, S4-096, S4-210, W3-510, W3-511, W3-509, W3-512, W3-513, S3-600, S3-601, S3-602, W3-508, W3-507, S3-50

DIRECT TEMPORARY RESOURCE IMPACTS (SF)

Resource	Small Puncheon	Large Puncheon	Drain Dips	Identified Trail Tread Regrading Area	Total Disturbance	Max. Potential Trail Tread Restoration*
BVW Impacts	0	0	0	0	0	0
Bank Impacts	0	0	0	0	0	0
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SWCA ENVIRONMENTAL CONSULTANTS

SWCA Environmental Consultants

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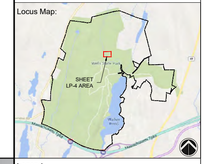
Prepared for:

MASSACHUSETTS DEPARTMENT OF CONSERVATION AND RECREATION

Greenways and Trails Program
136 Damon Road
Northampton, Massachusetts 01060

Locus Map:



Legend:

- PROPERTY LINES
- MAJOR CONTOUR (5' INTERVAL)
- MINOR CONTOUR (1' INTERVAL)
- BORDERING VEGETATED WETLAND
- STREAM
- 25-FOOT NO DISTURBANCE BUFFER
- 100-FOOT WETLAND BUFFER
- 100-FOOT RIVERFRONT BUFFER
- 200-FOOT RIVERFRONT BUFFER
- PRIMARY TRAIL (RESTORATION AREA)
- SECONDARY TRAIL (NON-REST.)
- BRIDGE STRUCTURE
- FOCUS RESTORATION AREA
- PROPOSED DIP DRAIN
- EROSION CONTROL BARRIER

ANSI D (22"x34") SCALE: 1"=20'
TABLOID (11"x17") SCALE: 1"=40'

0 20 40 80

Stamp:

Project Title:

DCR 837

WELLS STATE FOREST

ACCESSIBLE TRAIL IMPROVEMENTS AND MAINTENANCE

Sheet Title:

MAIN TREAD RESTORATION AREA PLAN

Date:	04/03/2023
Scale:	As Shown
Drawn by:	TS
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File #	72861.00

REVISIONS

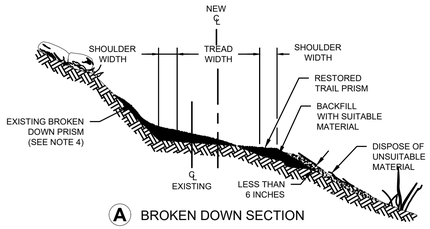
Date:	By:	Note:

Sheet No:

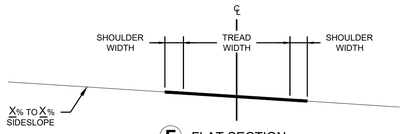
LP-4

NOTES:

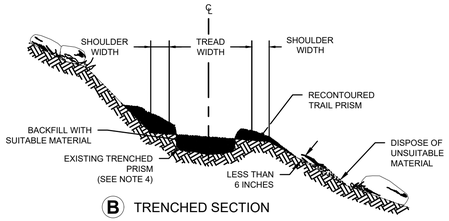
1. RE-ESTABLISH ORIGINAL DRAINAGE STRUCTURES TO MATCH NEW TREAD SURFACE.
2. INSTALL CHECK DAMS, DRAINAGE DIPS OR OTHER DRAINAGE STRUCTURES WHEN SPECIFIED.
3. DRAINAGE DIPS WILL BE STAKED IN THE FIELD WHEN REQUIRED.
4. USE ONLY SUITABLE MATERIAL TO CONSTRUCT RESTORED TRAIL PRISMS. DISPOSE OF UNSUITABLE MATERIAL AS SHOWN ON PLANS.
5. REVEGETATE DISTURBED OFF-TRAIL SURACES WITH APPROPRIATE NATIVE SEED MIX AND BIODEGRADABLE EROSION CONTROL FABRIC, AS REQUIRED.
6. SLASH CONSISTS OF LOGS, LIMBS, BRUSH, AND ROCKS PLACED RANDOMLY IN A WAY TO CATCH SEDIMENT MOVEMENT.
7. LIMB ALL TREES AND SHRUBS AND TAMP SLASH INTO GROUND SO THAT 80% OF SLASH IS IN CONTACT WITH THE GROUND.



A BROKEN DOWN SECTION



F FLAT SECTION



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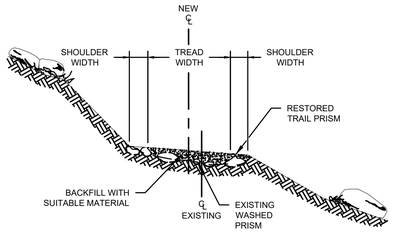
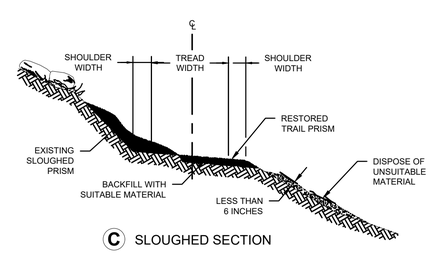
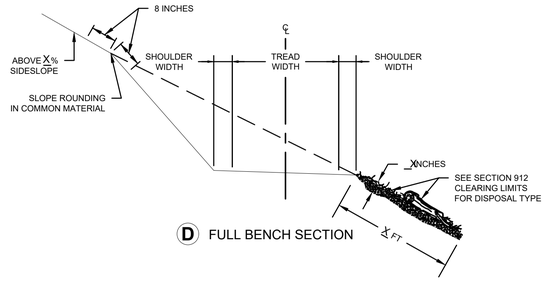


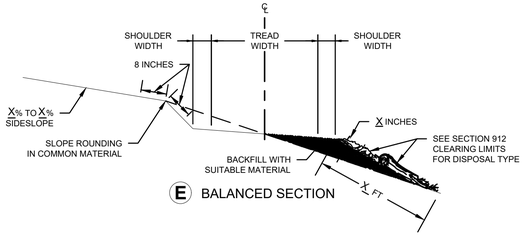
G WASHED SECTION



C SLOUGHED SECTION



D FULL BENCH SECTION



E BALANCED SECTION

EXISTING TRAIL RESTORATION

TYPICAL ID	SECTION TYPE	TREAD WIDTH	SHOULDER WIDTH		COMMENTS
			UPHILL	DOWNHILL	
	X	36" MIN.	X	X	X

TYPICAL TRAIL TREAD AND SHOULDER WIDTH

TYPICAL ID	SECTION TYPE	TREAD FINISH	TREAD WIDTH	SHOULDER WIDTH		COMMENTS
				UPHILL	DOWNHILL	
	X	TX	36" MIN.	X	X	X

TREAD CROSS SLOPE

TYPICAL ID	OUTSLOPE	INSLOPE	CROWNED SECTION	COMMENTS
TCS-1	5% MAX.	5% MAX.	5% MAX.	X

SLOPE AND TRAILBED FINISH

TREAD FINISH	ROOTS	LOOSE ROCK	EMBEDDED ROCK	COMMENTS
T1	2" MAX.	2" MAX.	2" MAX.	X
T2				
T3				
T4				
T5				
T6				

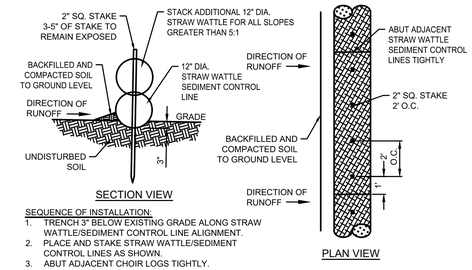
TRAILBED AND SLOPE FINISH

SLOPE FINISH

- REMOVE ROOTS THAT PROTRUDE FROM THE BACKSLOPE WITH DIAMETERS GREATER THAN SHOWN IN THE SLOPE AND TRAILBED FINISH TABLE.

TRAILBED FINISH

- REMOVE LOOSE ROCK ON THE TRAILBED WITH A DIMENSION GREATER THAN SHOWN IN THE SLOPE AND TRAILBED FINISH TABLE.
- REMOVE OR REDUCE EMBEDDED ROCK THAT PROTRUDES MORE THAN THE DIMENSIONS SHOWN IN THE SLOPE AND TRAILBED FINISH TABLE.



SEQUENCE OF INSTALLATION:
1. TRENCH 3" BELOW EXISTING GRADE ALONG STRAW WATTLE/SEDIMENT CONTROL LINE ALIGNMENT.
2. PLACE AND STAKE STRAW WATTLE/SEDIMENT CONTROL LINES AS SHOWN.
3. ABUT ADJACENT CHOIR LOGS TIGHTLY.
4. BACKFILL AND COMPACT EXCAVATED MATERIAL.

SPACING FOR SLOPE INSTALLATION:
1:1 SLOPES = 10 FT. APART
2:1 SLOPES = 20 FT. APART
3:1 SLOPES = 30 FT. APART
4:1 SLOPES = 40 FT. APART
STACKED WATTLES REQUIRED FOR SLOPES GREATER THAN 5:1

3 TYPICAL EROSION/SEDIMENT CONTROL STRAW WATTLE DETAIL

NOT TO SCALE

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Northampton, Massachusetts 01060

Locus Map:

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DCR 837

WELLS STATE FOREST

ACCESSIBLE TRAIL IMPROVEMENTS AND MAINTENANCE

Sheet Title:

TRAIL RESTORATION DETAILS

Date:	04/03/2023
Scale:	As Shown
Drawn by:	TS
Checked by:	CB
File #	72861.00

REVISIONS

Date:	By:	Note:

Sheet No:

LD-1

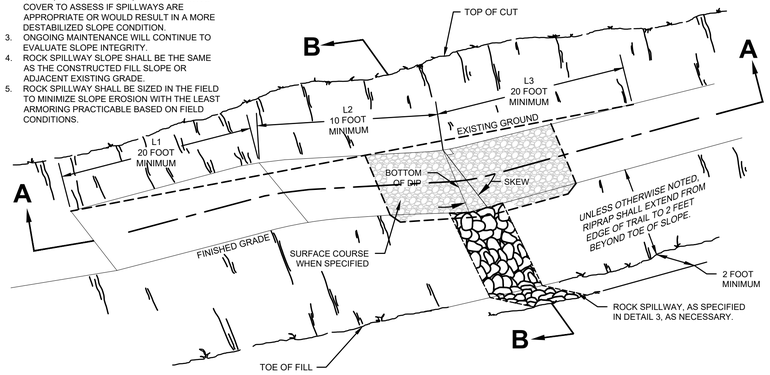
1 DRAIN DIP SECTION

SCALE: NTS

TYPICAL ID	DRAIN DIP TYPE	GEOTEXTILE TYPE	SKEW	SURFACE COURSE TYPE	SURFACE COURSE DEPTH	ROCK SPILLWAY***	COMMENTS
	DDX	GX	X	SX	X	X	X

N/A WHEN NOT APPLICABLE
***SEE ROCK SPILLWAY DETAILS

NOTES:
1. DRAIN DIPS WILL BE STAKED IN THE FIELD.
2. DRAIN DIP SLOPES WILL BE EVALUATED FOR GRADE, SOIL STRUCTURE, AND VEGETATIVE COVER TO ASSESS IF SPILLWAYS ARE APPROPRIATE OR WOULD RESULT IN A MORE DESTABILIZED SLOPE CONDITION.
3. ONGOING MAINTENANCE WILL CONTINUE TO EVALUATE SLOPE INTEGRITY.
4. ROCK SPILLWAY SLOPE SHALL BE THE SAME AS THE CONSTRUCTED FILL SLOPE OR ADJACENT EXISTING GRADE.
5. ROCK SPILLWAY SHALL BE SIZED IN THE FIELD TO MINIMIZE SLOPE EROSION WITH THE LEAST ARMORING PRACTICABLE BASED ON FIELD CONDITIONS.



GEOTEXTILE TYPE

TYPE	MATERIAL	COMMENTS
G1	NON-WOVEN	X
G2	WOVEN	
G3	X	

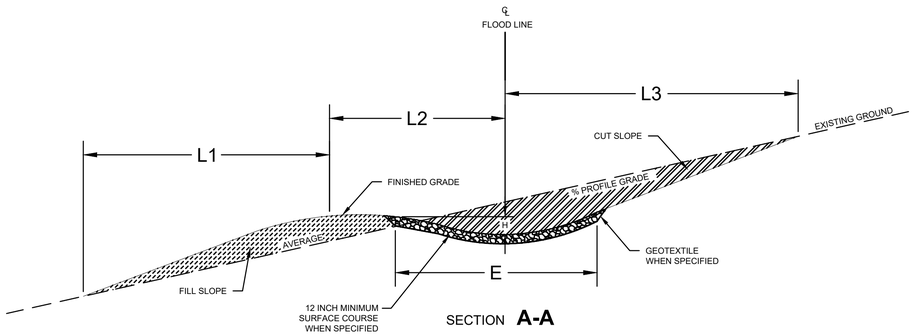
SURFACE COURSE MATERIAL TYPE

TYPE	MATERIAL	GRADATION	COMMENTS
S1	PITRUN	X	X
S2	AGGREGATE	X	
S3	X	X	

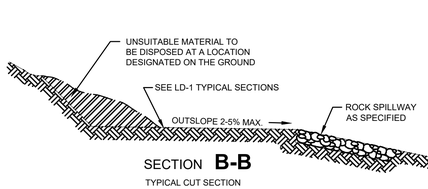
DRAIN DIP CONSTRUCTION DIMENSIONS

DRAIN DIP TYPE	% PROFILE GRADE	L1	L2	L3	(H)	(E)
DD1	0 TO 4	X	X	X	X	X
DD2	5 TO 6					
DD3	7 TO 8					
DD4	9 TO 10					
DD5	X					

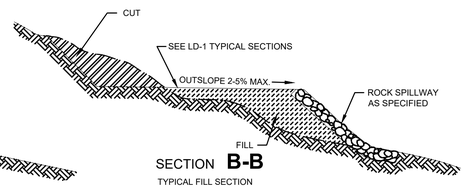
OVER 10% NOT RECOMMENDED
H = ℄ OF TREAD



SECTION **A-A**



SECTION **B-B**
TYPICAL CUT SECTION



SECTION **B-B**
TYPICAL FILL SECTION

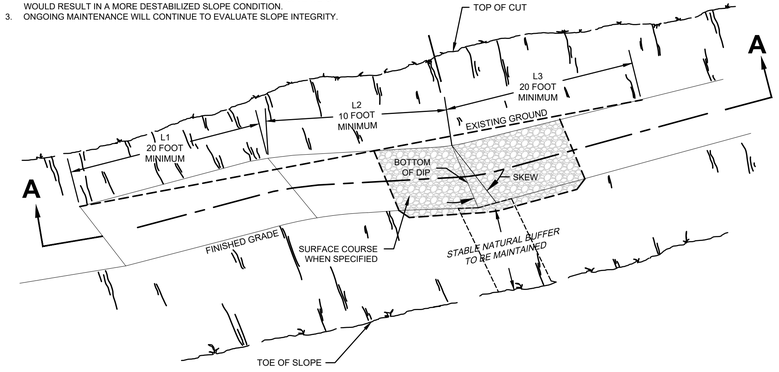
2 DRAIN DIP ALTERNATIVE SECTION (STABLE VEGETATED SLOPE)

SCALE: NTS

TYPICAL ID	DRAIN DIP TYPE	GEOTEXTILE TYPE	SKEW	SURFACE COURSE TYPE	SURFACE COURSE DEPTH	COMMENTS
	DDX	GX	X	SX	X	X

N/A WHEN NOT APPLICABLE

NOTES:
1. DRAIN DIPS WILL BE STAKED IN THE FIELD.
2. DRAIN DIP SLOPES WILL BE EVALUATED FOR GRADE, SOIL STRUCTURE, AND VEGETATIVE COVER TO ASSESS IF SPILLWAYS ARE APPROPRIATE OR WOULD RESULT IN A MORE DESTABILIZED SLOPE CONDITION.
3. ONGOING MAINTENANCE WILL CONTINUE TO EVALUATE SLOPE INTEGRITY.

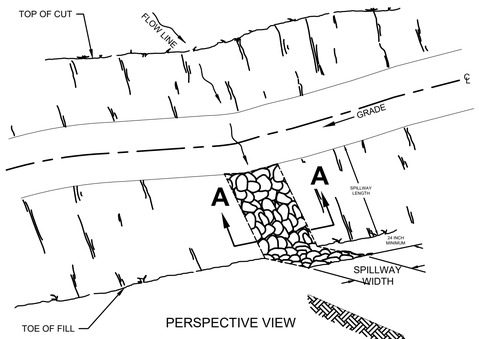


3 ROCK SPILLWAY

SCALE: NTS

TYPICAL ID	SPILLWAY WIDTH	SPILLWAY LENGTH	GEOTEXTILE TYPE	MINIMUM ROCK SIZE (LBS)	MAXIMUM ROCK SIZE (LBS)	RETAINER* TYPE	COMMENTS
	X	X	X	X	X	RxX	X

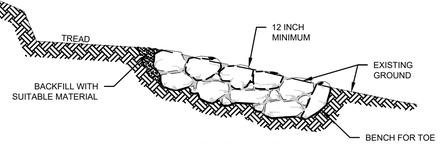
N/A WHEN NOT APPLICABLE
*FOR TYPICAL RETAINERS SEE SHEET STD_911-03



PERSPECTIVE VIEW

NOTES:
1. COMPACT BACKFILL IN 6 INCH LIFTS UNTIL NO VISUAL DISPLACEMENT.
2. ROCK SPILLWAY SHALL BE SIZED IN THE FIELD TO MINIMIZE SLOPE EROSION WITH THE LEAST ARMORING PRACTICABLE BASED ON FIELD CONDITIONS.
3. THE FINISHED SURFACE OF THE SPILLWAY SHALL BE AT THE SAME ELEVATION AS THE ADJACENT SLOPE.

SECTION **A-A**



ELEVATION VIEW

ROCK SPILLWAY FOR DRAINAGE DIP OR CROSS DRAIN

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Locus Map:

Legend:

Stamp:

Project Title:

DCR 837

WELLS STATE FOREST

ACCESSIBLE TRAIL
IMPROVEMENTS AND MAINTENANCE

Sheet Title:

DRAIN DIP AND EROSION CONTROL DETAILS

Date:	04/03/2023
Scale:	As Shown
Drawn by:	TS
Checked by:	CB
File #	72861.00

REVISIONS

Date:	By:	Note:

Sheet No:

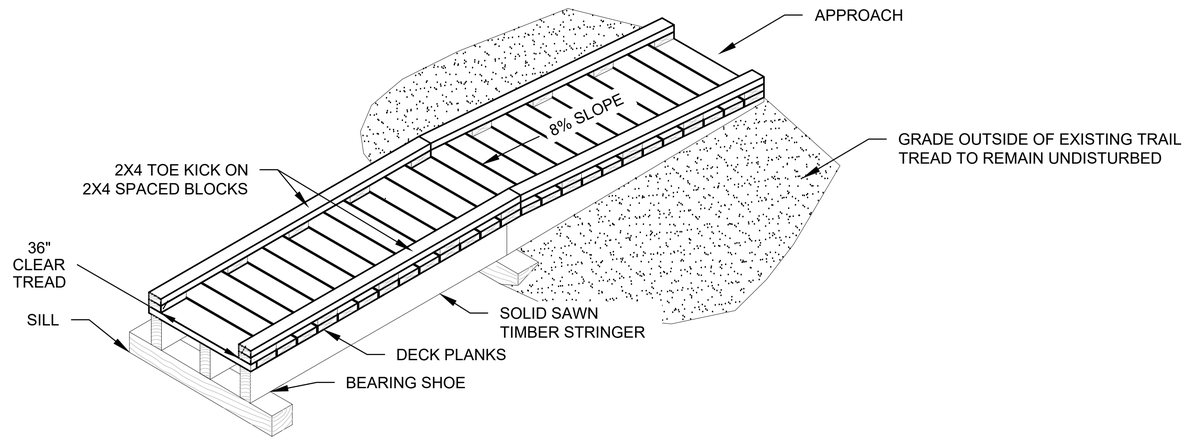
LD-2

								STRINGERS					DECK			BACKWALL					
STRUCTURE NUMBER	TRAIL NO.	BRIDGE LOCATION	BRIDGE LENGTH OUT-TO-OUT	STRINGER SPAN - BRNG	BRIDGE CLEAR WIDTH	PEDESTRIAN LOAD	GROUND SNOW LOAD	SPECIES	NUMBER	MATERIAL SIZE	TREATMENT		SPECIES	SIZE	TREATMENT	TYPE	SPECIES	SIZE	WIDTH	HEIGHT	TREATMENT
											YES	NO									
X	X	X+XX	X	X	X	X	X	X	X	XxX	X	X	X	3xX	YES	X	X	3xX	X	X	YES
X																					
X																					
X																					
X																					
X																					

NA = NOT APPLICABLE

	RAILING SYSTEM/CURB						RUNNING PLANK					SILL			APPROACHES						HARDWARE	
STRUCTURE NUMBER	SPECIES	TYPE	HEIGHT	MATERIAL TYPE	TREATMENT		SPECIES	SIZE	WIDTH	TREATMENT		TYPE	SIZE	TREATMENT	LENGTH		WIDTH	MATERIAL TYPE	MATERIAL DEPTH	GEO-SYNTHETIC TYPE	COATINGS	COMMENTS
					YES	NO				YES	NO				NEAR	FAR						
X	X	X	X	X	X	X	X	2xX	X	X	X	X	XxX	YES	X	X	X	X	X	X	X	X
X																						
X																						
X																						
X																						
X																						

- ABUTMENT MATERIAL TYPE: SS = SOLID SAWN, GLU = GLULAM, CONC = CONCRETE
- HARDWARE COATING TYPE: GALV = GALVANIZED, UNC = UNCOATED, WEA = WEATHERING STEEL
- FOOTINGS FOR BRIDGES AT STREAM CROSSINGS SHALL BE PLACED A MINIMUM OF 1.2 TIMES THE BANKFULL WIDTH



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WELLS STATE FOREST

ACCESSIBLE TRAIL
IMPROVEMENTS AND MAINTENANCE

Sheet Title:

ACCESSIBLE TRAIL
PUNCHEON CROSSING
DETAIL

Date:	04/03/2023
Scale:	As Shown
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Checked by:	CB
File #	72861.00

REVISIONS

Date:	By:	Note:

Sheet No:

LD-3

								STRINGERS					DECK			BACKWALL					
STRUCTURE NUMBER	TRAIL NO.	BRIDGE LOCATION	BRIDGE LENGTH OUT-TO-OUT	STRINGER SPAN - BRNG	BRIDGE CLEAR WIDTH	PEDESTRIAN LOAD	GROUND SNOW LOAD	SPECIES	NUMBER	MATERIAL SIZE	TREATMENT		SPECIES	SIZE	TREATMENT	TYPE	SPECIES	SIZE	WIDTH	HEIGHT	TREATMENT
											YES	NO									
X	X	X+XX	X	X	X	X	X	X	X	XxX	X	X	X	3xX	YES	X	X	3xX	X	X	YES
X																					
X																					
X																					
X																					
X																					

NA = NOT APPLICABLE

	RAILING SYSTEM/CURB						RUNNING PLANK					SILL			APPROACHES						HARDWARE	
STRUCTURE NUMBER	SPECIES	TYPE	HEIGHT	MATERIAL TYPE	TREATMENT		SPECIES	SIZE	WIDTH	TREATMENT		TYPE	SIZE	TREATMENT	LENGTH		WIDTH	MATERIAL TYPE	MATERIAL DEPTH	GEO-SYNTHETIC TYPE	COATINGS	COMMENTS
					YES	NO				YES	NO				NEAR	FAR						
X	X	X	X	X	X	X	X	2xX	X	X	X	X	XxX	YES	X	X	X	X	X	X	X	X
X																						
X																						
X																						
X																						
X																						

- ABUTMENT MATERIAL TYPE: SS = SOLID SAWN, GLU = GLULAM, CONC = CONCRETE
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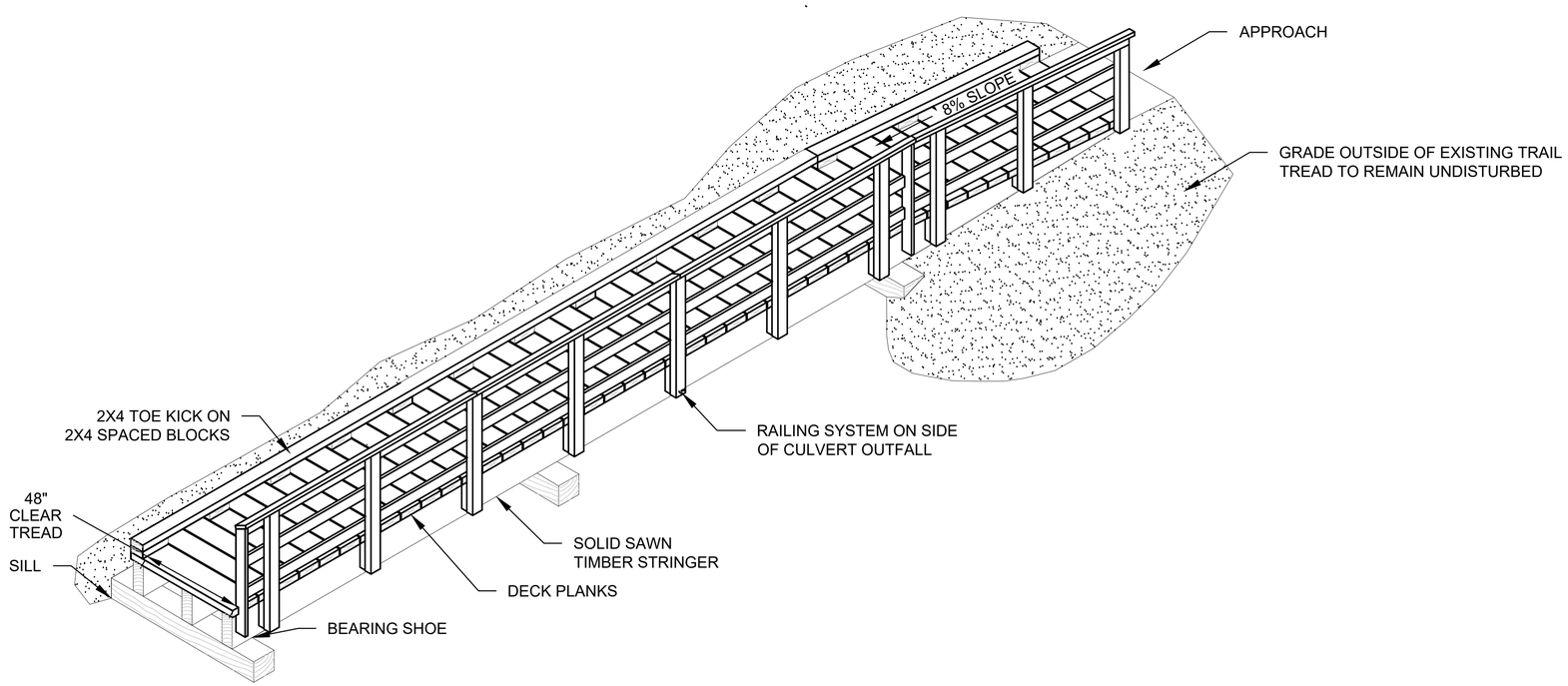
- FOOTINGS FOR BRIDGES AT STREAM CROSSINGS SHALL BE PLACED A MINIMUM OF 1.2 TIMES THE BANKFULL WIDTH



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WELLS STATE FOREST

ACCESSIBLE TRAIL
IMPROVEMENTS AND MAINTENANCE

Sheet Title:

ACCESSIBLE RAILED PUNCHEON CROSSING DETAIL

Date:	04/03/2023
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REVISIONS

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LD-4

NOTES:

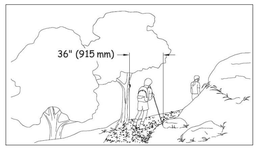
To the extent practicable, all trail restoration measures prescribed herein shall adhere to the United States Forest Service Trail Accessibility Guidelines (FSTAG) 7.4 Technical Provisions, referenced below.

7.4 Technical Provisions

General: Trails shall comply with 7.4.

7.4.1 Surface.
The trail tread surface, including resting intervals and passing spaces, shall be both firm and stable.

7.4.2 Clear Tread Width.
The clear tread width of the trail shall be at least 36 inches (915 mm).



EXCEPTION: Where a condition for an exception prevents achieving the required width, the clear tread width may be reduced to 32 inches (815 mm) minimum. If the condition for an exception prevents achieving the reduced width of 32 inches, comply to the extent practicable.

7.4.3 Slope.
Trail running slopes (grades) and cross slopes shall comply with sections 7.4.3.1 and 7.4.3.2.

7.4.3.1 Running Slope (Grade). The running slope (grade) of trail segments shall comply with this section and shall be consistent over the distances cited.
- Trail running slope (grade) of up to 1:20 (5 percent) is permitted for any distance.
- The running slope of any segment of a trail shall not be steeper than 1:8 (12 percent).
- No more than 30 percent of the total trail length may exceed a running slope (grade) of 1:12 (8.33 percent).
- Where the running slope (grade) of a segment of a trail is steeper than 1:20 (5 percent), the maximum length of the segment shall be in accordance with Table

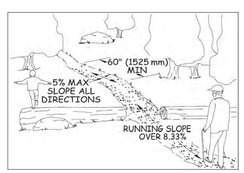
7.4.3.1, and a resting interval complying with 7.4.4 shall be provided at each end of the segment.

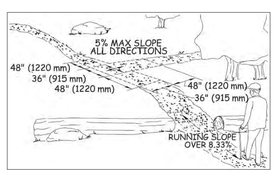
Table 7.4.3.1 Trail Running Slope (Grade) and Resting Intervals

Running Slope of Trail Segment		Maximum Length of Segment
Steeper Than	But Not Steeper Than	Between Resting Intervals
1:20 (5 percent)	1:12 (8.33 percent)	200 feet (61 m)
1:12 (8.33 percent)	1:10 (10 percent)	30 feet (9 m)
1:10 (10 percent)	1:8 (12 percent)	10 feet (3050 mm)

7.4.3.2 Cross Slope. The cross slope shall not exceed 1:20 (5 percent). Where the surface is paved or is elevated above the natural ground, the cross slope shall not be steeper than 1:48 (2 percent).

7.4.4 Resting Intervals.
Resting intervals shall comply with 7.4.4. Where the trail grade exceeds 1:20 (5 percent), resting intervals shall be provided as specified in Table 7.4.3.1.





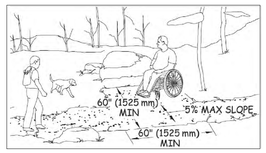
7.4.4.1 Length. The resting interval length shall be 60 inches (1525 mm) long minimum.

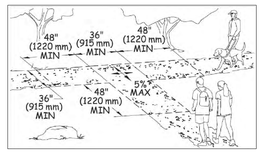
7.4.4.2 Width. Where resting intervals are provided within the trail tread, resting intervals shall be at least as wide as the widest segment of the trail tread leading to the resting interval. Where resting intervals are provided adjacent to the trail tread, the resting interval clear width shall be 36 inches (915 mm) minimum.

7.4.4.3 Slope. The slope of a resting interval shall not exceed 1:20 (5 percent) in any direction. Where the surface is paved or is elevated above the natural ground, the slope shall not be steeper than 1:48 (2 percent) in any direction.

7.4.4.4 Turning Space. Where resting intervals are provided adjacent to the trail tread, a turning space complying with ABAAS section 304.3.2 shall be provided. Vertical alignment between the trail tread, turning space, and resting interval shall be nominally level. The trail tread, turning space, and resting interval may overlap.

7.4.5 Passing Spaces.
Trails with a clear tread width less than 60 inches (1525 mm) shall provide passing spaces complying with 7.4.5 at intervals of 1000 feet (300 m) maximum. A passing space must also be provided at the end of any segment of trail that meets the requirements of 7.4, if the full length of the trail does not meet the requirements. Passing spaces and resting intervals may coincide or overlap.





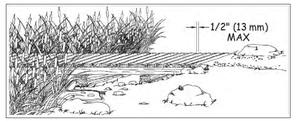
7.4.5.1 Size. The passing space shall be either:
- A space 60 inches (1525 mm) minimum by 60 inches (1525 mm) minimum; or
- The intersection of two trails providing a T-shaped space complying with ABAAS section 304.3.2 where the base and the arms of the T-shaped space extend 48 inches (1220 mm) minimum beyond the intersection. Vertical alignment at the intersection of the trails that form the T-shaped space shall be nominally level.

7.4.5.2 Slope. The cross slope of a passing space shall not exceed 1:20 (5 percent) in any direction.

7.4.5.3 Non-complying Segment Ends. Where a segment of the trail does not comply with 7.4, a passing space shall be located at the end of each adjacent trail segment that does comply with 7.4.

7.4.6 Tread Obstacles.
Tread obstacles on trails shall not exceed 2 inches (50 mm) in height measured vertically to the highest point. Where the trail surface is paved or is elevated above the natural ground, tread obstacles shall not exceed ½ inch (13 mm) in height measured vertically to the highest point.

7.4.7 Openings.
Openings in trail tread surfaces, trail resting spaces, and trail passing spaces shall be small enough to prevent passage of a 1/2 inch- (13 mm-) diameter sphere. Where possible, elongated openings should be placed perpendicular, or as close to perpendicular as possible, to the dominant direction of travel.



Exception: Where openings that do not permit the passage of a ⅛ inch (6.4 mm) sphere cannot be provided due to a condition for an exception, openings that do not permit passage of a ¾ inch (19 mm) sphere shall be permitted.

7.4.8 Protruding Objects.
Constructed features, including signs, shall not extend into the trail tread more than 4 inches (100 mm) between 27 inches (685 mm) and 80 inches (2030 mm) above the surface of the trail.

7.4.9 Trail Facilities.
Where provided on trails, facilities shall comply with the applicable provisions of the FSORAG. ORARs are not required at or between facilities on trails.

Exception. When the surface of the required clear ground space for trail facilities is not paved or is not elevated above the natural ground, slopes not steeper than 1:20 (5 percent) shall be permitted where necessary for drainage.

7.4.10 Trailheads.
Trailheads shall comply with 7.4.10.

7.4.10.1 Outdoor Constructed Features. Where provided within trailheads each outdoor constructed features such as parking spaces, toilets, or camp sites shall comply with the applicable portions of the FSORAG and ABAAS.

7.4.10.2 Outdoor Recreation Access Routes (ORARs).
At least one outdoor recreation access route complying with FSORAG section 2.0 shall connect the following places at trailheads:
- Accessible parking spaces or other arrival point;
- Starting point of the trail; and
- Accessible outdoor constructed features, elements, spaces, and facilities within the trailhead.

Exception 1. In alterations to existing trailheads, where a condition for exception prohibits compliance with a technical provision, the ORAR shall comply with FSORAG 2.0 to maximum extent practicable.

Exception 2. Where elements, spaces, or outdoor constructed features are altered at trailheads but the circulation path is not altered, an outdoor recreation access route shall not be required.

7.4.11 Trailhead Signs.
Where new trailhead information signs are provided at trailheads on newly constructed or altered trails, they shall comply with 7.4.11.

7.4.11.1 Clear Space. Trailhead signs shall be located centered at the back of a 30- by 48-inch (760- by 1,220-millimeter) minimum clear floor or ground space. The clear space shall not overlap the trail width but may overlap a resting space or passing space. The slope of the clear space shall not exceed 1:20 (5 percent) in any direction.

7.4.11.2 Sign Contents. Where new trail information signs are provided at trailheads on newly constructed or altered trails, regardless of whether the trail is accessible, the signs shall include at minimum the following information:

- Length of the trail or trail segment
- Surface type
- Typical and minimum tread width
- Typical and maximum running slope
- Typical and maximum cross slope
- A statement that the posted information reflects the condition of the trail when it was constructed or assessed, including the date of the construction or assessment

Where more extensive trail information is provided (e.g., an aerial map of the trail and related facilities), the location of specific trail features and obstacles that do not comply with the technical provisions in 7.4 should be identified and a profile of the trail grade should be included.

7.4.11.3 Reach Ranges. If materials need to be obtained from or manipulated on a sign or kiosk, the sign or kiosk shall be designed to meet the reach ranges in section 308 of the ABAAS.

7.4.12 Gates and Barriers.
Where gates or barriers are constructed to control access to trails, gates and barriers shall comply with 7.4.12.

7.4.12.1 Clear Width. Gate openings and openings in barriers for hiker passage shall provide a clear width of 36 inches (915 mm), complying with ODAAG, section 1017.3 Clear Tread Width.

7.4.12.2 Gate Hardware. Gate hardware shall comply with operable controls requirements in ABAAS section 309.4 and 404.2.7.

Prepared by:

SWCA ENVIRONMENTAL CONSULTANTS

SWCA Environmental Consultants

15 Research Drive
Amherst, MA 01002
(p) 413.256.0202
(f) 413.256.1092
www.swca.com

Prepared for:

MASSACHUSETTS DEPARTMENT OF CONSERVATION AND RECREATION

Greenways and Trails Program
136 Damon Road
Northampton, Massachusetts 01060

Locus Map:

Legend:

Stamp:

Project Title:

DCR 837

WELLS STATE FOREST

ACCESSIBLE TRAIL IMPROVEMENTS AND MAINTENANCE

Sheet Title:

NOTES

Date:	04/03/2023
Scale:	As Shown
Drawn by:	TS
Checked by:	CB
File #	72861.00

REVISIONS

Date:	By:	Note:

Sheet No:

LD-5

APPENDIX B

Site Photographs

Photo 1. View of the Trailhead to the Mill Pond Trail Loop. *Photograph taken May 26, 2022.*

Photo 2. This footbridge is not proposed to be replaced at this time; however, the geogrid beneath the stone dust has become exposed and new stone is proposed to be added to maintain an even trail. *Photograph taken May 26, 2022.*

Photo 3. Several sections of trail exhibit exposed geogrid where the top-dressing has worn thin and new crushed stone is proposed to be applied. *Photograph taken May 26, 2022.*

Photo 4. View facing northeast at the trail crossing with Stream S3. DCR proposes to add a wooden puncheon here this. *Photograph taken May 26, 2022.*

Photo 5. View facing downstream at the Stream S3/trail crossing. *Photograph taken May 26, 2022*.

Photo 6. Overflow plastic culverts at Stream S3 crossing. *Photograph taken May 26, 2022.*

Photo 7. View facing downstream at the Stream S3 crossing. *Photograph taken May 26, 2022.*

Photo 8. View facing west showing an area of erosion in the trail. This is proposed to be spot-graded to reduce cross slope and protect downgradient resource areas. *Photograph taken May 26, 2022.*

Photo 9. View facing southwest at the Stream S4 trail crossing. No improvements are proposed to the crossing; however, debris has accumulated in the culvert inlet. *Photograph taken May 26, 2022*.

Photo 10. View of the culvert inlet at Stream S4, which has become clogged with organic debris. *Photograph taken May 26, 2022.*

Photo 11. View facing upstream at the Stream S4 inlet. Note the material accumulated. *Photograph taken May 26, 2022*.

Photo 12. View of the culvert outlet, which is clear of debris, at the Stream S4 trail crossing. *Photograph taken May 26, 2022*.

Photo 13. View of the Mill Pond Trail dead end. *Photograph taken May 26, 2022*.

Photo 14. Portion of the Mill Pond Trail that is paved. *Photograph taken May 26, 2022*.

Photo 15. This beaver dam at Stream S2 has created an impounded stream, which now functions as a perennial stream (despite being mapped as intermittent). *Photograph taken May 26, 2022*.

Photo 13. View of trail section near Mill Pond. *Photograph taken May 26, 2022*.

Photo 14. View facing downstream (southeast) at Stream S3 trail crossing. *Photograph taken May 26, 2022*.

Photo 15. View of Mill Pond. *Photograph taken May 26, 2022*.

APPENDIX C

Forms and Receipt of Pay

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 3 - Notice of Intent
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
MassDEP File #:
eDEP Transaction #:1528931
City/Town:STURBRIDGE

A.General Information

1. Project Location:

a. Street Address	159 WALKER POND ROAD (WELLS STATE PARK)		
b. City/Town	STURBRIDGE	c. Zip Code	01566
d. Latitude	42.14661N	e. Longitude	72.06179W
f. Map/Plat #	660	g.Parcel/Lot #	01233-159

2. Applicant:

☐ Individual ☑ Organization

a. First Name	ELLEN	b.Last Name	HUFFMAN		
c. Organization	DEPARTMENT OF CONSERVATION AND RECREATION				
d. Mailing Address	251 CAUSEWAY STREET, SUITE 600				
e. City/Town	BOSTON	f. State	MA	g. Zip Code	02114
h. Phone Number	413-586-8706	i. Fax	413-784-1663	j. Email	ellen.huffman@mass.gov

3.Property Owner:

☐ more than one owner

a. First Name	PREISCILLA	b. Last Name	GEIGIS		
c. Organization	COMMONWEALTH OF MASSACHUSETTS				
d. Mailing Address	100 CAMBRIDGE STREET				
e. City/Town	BOSTON	f.State	MA	g. Zip Code	02114
h. Phone Number		i. Fax		j.Email	

4.Representative:

a. First Name	CHRISTIN	b. Last Name	MCDONOUGH		
c. Organization	SWCA ENVIRONMENTAL CONSULTANTS, INC.				
d. Mailing Address	15 RESEARCH DRIVE				
e. City/Town	AMHERST	f. State	MA	g. Zip Code	01002
h.Phone Number	413-658-2063	i.Fax		j.Email	cmcdonough@swca.com

5.Total WPA Fee Paid (Automatically inserted from NOI Wetland Fee Transmittal Form):

a.Total Fee Paid	750.00	b.State Fee Paid	362.50	c.City/Town Fee Paid	387.50

6.General Project Description:

ON BEHALF OF THE MASSACHUSETTS DEPARTMENT OF CONSERVATION AND RECREATION (APPLICANT), SWCA ENVIRONMENTAL CONSULTANTS (SWCA) HAS PREPARED A NOTICE OF INTENT (NOI) APPLICATION FOR TRAIL MAINTENANCE AND IMPROVEMENT AT THE EXISTING MILL POND TRAIL LOOP WITHIN WELLS STATE PARK IN STURBRIDGE, MASSACHUSETTS (PARCEL 660-01233-159). TRAIL MAINTENANCE AND IMPROVEMENTS WILL OCCUR WITHIN PORTIONS OF BORDERING VEGETATED WETLAND, RIVERFRONT AREA, AND BUFFER ZONE TO RESOURCE AREAS; HOWEVER, IMPACTS WILL ONLY OCCUR WITHIN RIVERFRONT AREA AND BUFFER ZONE TOTALING 6,010 SQUARE FEET OF TEMPORARY WORK ASSOCIATED WITH IMPROVEMENTS OF THE EXISTING TRAIL AND 55 SQUARE FEET OF PERMANENT IMPACTS ASSOCIATED WITH DRAINAGE IMPROVEMENTS (40 SQUARE FEET) AND A NEW WHEELCHAIR REST AREA (15 SQUARE FEET) ADJACENT TO THE TRAIL TO MEET ACCESSIBILITY STANDARDS. THE 55 SQUARE FEET OF

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TRAIL WIDENING WILL REMAIN AS PERVIOUS SURFACE AREA. THESE RESOURCE AREAS ARE REGULATED UNDER THE MASSACHUSETTS WETLANDS PROTECTION ACT (M.G.L. C. 131 ? 40) AND ITS IMPLEMENTING REGULATIONS (310 CMR 10.00 ET SEQ.) AS WELL AS THE TOWN OF STURBRIDGE WETLAND PROTECTION BYLAW (CH. 286) AND IMPLEMENTING REGULATIONS (CH. 365). THE TRAIL MAINTENANCE AND IMPROVEMENT ACTIVITY PROPOSES TO IMPROVE EXISTING CONDITIONS AND DOES NOT ALTERATION TO RESOURCE AREAS OR ADVERSE IMPACTS TO RESOURCE AREAS.

7a.Project Type:

1. ☐ Single Family Home
2. ☐ Residential Subdivision
3. ☐ Limited Project Driveway Crossing
4. ☐ Commercial/Industrial
5. ☐ Dock/Pier
6. ☐ Utilities
7. ☐ Coastal Engineering Structure
8. ☐ Agriculture (eg., cranberries, forestry)
9. ☐ Transportation
10. ☑ Other

7b.Is any portion of the proposed activity eligible to be treated as a limited project subject to 310 CMR 10.24 (coastal) or 310 CMR 10.53 (inland)?

1. ☐ Yes ☑ No If yes, describe which limited project applies to this project:
2. Limited Project

8.Property recorded at the Registry of Deeds for:

a.County:	b.Certificate:	c.Book:	d.Page:
WORCESTER		4251	597

B. Buffer Zone & Resource Area Impacts (temporary & permanent)

1.Buffer Zone & Resource Area Impacts (temporary & permanent):

☐ This is a Buffer Zone only project - Check if the project is located only in the Buffer Zone of a Bordering Vegetated Wetland, Inland Bank, or Coastal Resource Area.

2.Inland Resource Areas: (See 310 CMR 10.54 - 10.58, if not applicable, go to Section B.3. Coastal Resource Areas)

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
a. ☐ Bank	1. linear feet	2. linear feet
b. ☐ Bordering Vegetated Wetland	1. square feet	2. square feet
c. ☐ Land under Waterbodies and Waterways	1. Square feet	2. square feet
	3. cubic yards dredged	
d. ☐ Bordering Land Subject to Flooding	1. square feet	2. square feet
	3. cubic feet of flood storage lost	4. cubic feet replaced
e. ☐ Isolated Land Subject to Flooding	1. square feet	

	2. cubic feet of flood storage lost	3. cubic feet replaced
f. ☑ Riverfront Area	Unnamed Stream 1. Name of Waterway (if any)	
2. Width of Riverfront Area (check one)	☐ 25 ft. - Designated Densely Developed Areas only ☐ 100 ft. - New agricultural projects only ☑ 200 ft. - All other projects	
3. Total area of Riverfront Area on the site of the proposed project		975417.1 square feet

4. Proposed Alteration of the Riverfront Area:

a. total square feet	b. square feet within 100 ft.	c. square feet between 100 ft. and 200 ft.
55	55	0

5. Has an alternatives analysis been done and is it attached to this NOI? ☑ Yes ☐ No

6. Was the lot where the activity is proposed created prior to August 1, 1996? ☑ Yes ☐ No

3.Coastal Resource Areas: (See 310 CMR 10.25 - 10.35)

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
a. ☐ Designated Port Areas	Indicate size under	Land under the ocean below,
b. ☐ Land Under the Ocean	1. square feet 2. cubic yards dredged	
c. ☐ Barrier Beaches	Indicate size under Coastal Beaches and/or Coatstal Dunes, below	
d. ☐ Coastal Beaches	1. square feet	2. cubic yards beach nourishment
e. ☐ Coastal Dunes	1. square feet	2. cubic yards dune nourishment
f. ☐ Coastal Banks	1. linear feet	
g. ☐ Rocky Intertidal Shores	1. square feet	
h. ☐ Salt Marshes	1. square feet	2. sq ft restoration, rehab, crea.
i. ☐ Land Under Salt Ponds	1. square feet	
	2. cubic yards dredged	
j. ☐ Land Containing Shellfish	1. square feet	
k. ☐ Fish Runs	Indicate size under Coastal Banks, Inland Bank, Land Under the Ocean, and/or inland Land Under Waterbodies and Waterways, above	

	1. cubic yards dredged	
l. ☐ Land Subject to Coastal Storm Flowage	1. square feet	

4.Restoration/Enhancement

☐ Restoration/Replacement

If the project is for the purpose of restoring or enhancing a wetland resource area in addition to the square footage that has been entered in Section B.2.b or B.3.h above, please entered the additional amount here.

a. square feet of BVW | b. square feet of Salt Marsh

5.Projects Involves Stream Crossings

☐ Project Involves Streams Crossings

If the project involves Stream Crossings, please enter the number of new stream crossings/number of replacement stream crossings.

a. number of new stream crossings | b. number of replacement stream crossings

C. Other Applicable Standards and Requirements

Streamlined Massachusetts Endangered Species Act/Wetlands Protection Act Review

1. Is any portion of the proposed project located in **Estimated Habitat of Rare Wildlife** as indicated on the most recent Estimated Habitat Map of State-Listed Rare Wetland Wildlife published by the Natural Heritage of Endangered Species program (NHESP)?

a. ☑ Yes ☐ No

If yes, include proof of mailing or hand delivery of NOI to:
Natural Heritage and Endangered Species
Program
Division of Fisheries and Wildlife
1 Rabbit Hill Road
Westborough, MA 01581

b. Date of map:FROM MAP VIEWER

If yes, the project is also subject to Massachusetts Endangered Species Act (MESA) review (321 CMR 10.18)....

c. Submit Supplemental Information for Endangered Species Review * (Check boxes as they apply)

1. ☑ Percentage/acreage of property to be altered:

(a) within Wetland Resource Area	0.1379/1,400=0.009% percentage/acreage
(b) outside Resource Area	0 percentage/acreage

2. ☑ Assessor's Map or right-of-way plan of site

3. ☑ Project plans for entire project site, including wetland resource areas and areas outside of wetland jurisdiction, showing existing and proposed conditions, existing and proposed tree/vegetation clearing line, and clearly demarcated limits of work **

a. ☑ Project description (including description of impacts outside of wetland resource area & buffer zone)

b. ☑ Photographs representative of the site

c. ☑ MESA filing fee (fee information available at: http://www.mass.gov/eea/agencies/dfg/dfw/natural-heritage/regulatory-review/mass-endangered-species-act-mesa/mesa-fee-schedule.html)
Make check payable to "Natural Heritage & Endangered Species Fund" and **mail to NHESP** at above address

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*Projects altering **10 or more acres** of land, also submit:*

d. ☐ Vegetation cover type map of site

e. ☐ Project plans showing Priority & Estimated Habitat boundaries

d. OR Check One of the following

1. ☐ Project is exempt from MESA review. Attach applicant letter indicating which MESA exemption applies. (See 321 CMR 10.14, http://www.mass.gov/eea/agencies/dfg/dfw/laws-regulations/cmr/321-cmr-1000-massachusetts-endangered-species-act.html#10.14; the NOI must still be sent to NHESP if the project is within estimated habitat pursuant to 310 CMR 10.37 and 10.59.)

2. ☐ Separate MESA review ongoing.

a. NHESP Tracking Number

b. Date submitted to NHESP

3. ☐ Separate MESA review completed.

Include copy of NHESP "no Take" determination or valid Conservation & Management Permit with approved plan.

* Some projects **not** in Estimated Habitat may be located in Priority Habitat, and require NHESP review...

2. For coastal projects only, is any portion of the proposed project located below the mean high waterline or in a fish run?

a. ☑ Not applicable - project is in inland resource area only

b. ☐ Yes ☐ No

If yes, include proof of mailing or hand delivery of NOI to either:

South Shore - Cohasset to Rhode Island, and the Cape & Islands:

Division of Marine Fisheries -
Southeast Marine Fisheries Station
Attn: Environmental Reviewer
836 S. Rodney French Blvd
New Bedford, MA 02744

North Shore - Hull to New Hampshire:

Division of Marine Fisheries -
North Shore Office
Attn: Environmental Reviewer
30 Emerson Avenue
Gloucester, MA 01930

If yes, it may require a Chapter 91 license. For coastal towns in the Northeast Region, please contact MassDEP's Boston Office. For coastal towns in the Southeast Region, please contact MassDEP's Southeast Regional office.

3. Is any portion of the proposed project within an Area of Critical Environmental Concern (ACEC)?

a. ☐ Yes ☑ No

If yes, provide name of ACEC (see instructions to WPA Form 3 or DEP Website for ACEC locations). **Note:** electronic filers click on Website.

b. ACEC Name

4. Is any portion of the proposed project within an area designated as an Outstanding Resource Water (ORW) as designated in the Massachusetts Surface Water Quality Standards, 314 CMR 4.00?

a. ☐ Yes ☑ No

5. Is any portion of the site subject to a Wetlands Restriction Order under the Inland Wetlands Restriction Act (M.G.L.c. 131, § 40A) or the Coastal Wetlands Restriction Act (M.G.L.c. 130, § 105)?

a. ☐ Yes ☑ No

6. Is this project subject to provisions of the MassDEP Stormwater Management Standards?

a. ☐ Yes, Attach a copy of the Stormwater Report as required by the Stormwater Management Standards per 310 CMR

10.05(6)(k)-(q) and check if:

1. ☐ Applying for Low Impact Development (LID) site design credits (as described in Stormwater Management Handbook Vol.2, Chapter 3)
2. ☐ A portion of the site constitutes redevelopment
3. ☐ Proprietary BMPs are included in the Stormwater Management System

b. ☑ No, Explain why the project is exempt:

1. ☐ Single Family Home
2. ☐ Emergency Road Repair
3. ☐ Small Residential Subdivision (less than or equal to 4 single-family houses or less than or equal to 4 units in multi-family housing project) with no discharge to Critical Areas.

D. Additional Information

Applicants must include the following with this Notice of Intent (NOI). See instructions for details.

Online Users: Attach the document transaction number (provided on your receipt page) for any of the following information you submit to the Department by regular mail delivery.

1. ☑ USGS or other map of the area (along with a narrative description, if necessary) containing sufficient information for the Conservation Commission and the Department to locate the site. (Electronic filers may omit this item.)
2. ☑ Plans identifying the location of proposed activities (including activities proposed to serve as a Bordering Vegetated Wetland [BVW] replication area or other mitigating measure) relative to the boundaries of each affected resource area.
3. ☑ Identify the method for BVW and other resource area boundary delineations (MassDEP BVW Field Data Form(s). Determination of Applicability, Order of Resource Area Delineation, etc.), and attach documentation of the methodology.
4. ☑ List the titles and dates for all plans and other materials submitted with this NOI.

a. Plan Title:	b. Plan Prepared By:	c. Plan Signed/Stamped By:	c. Revised Final Date:	e. Scale:
WELLS STATE FOREST TRAIL RESTORATION PLAN SET	SWCA		April 3, 2023	

5. ☐ If there is more than one property owner, please attach a list of these property owners not listed on this form.
6. ☑ Attach proof of mailing for Natural Heritage and Endangered Species Program, if needed.
7. ☑ Attach proof of mailing for Massachusetts Division of Marine Fisheries, if needed.
8. ☑ Attach NOI Wetland Fee Transmittal Form.
9. ☐ Attach Stormwater Report, if needed.

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E. Fees

1. Fee Exempt: No filing fee shall be assessed for projects of any city, town, county, or district of the Commonwealth, federally recognized Indian tribe housing authority, municipal housing authority, or the Massachusetts Bay Transportation Authority.

Applicants must submit the following information (in addition to pages 1 and 2 of the NOI Wetland Fee Transmittal Form) to confirm fee payment:

2. Municipal Check Number	3. Check date
4. State Check Number	5. Check date
6. Payer name on check: First Name	7. Payer name on check: Last Name

F. Signatures and Submittal Requirements

I hereby certify under the penalties of perjury that the foregoing Notice of Intent and accompanying plans, documents, and supporting data are true and complete to the best of my knowledge. I understand that the Conservation Commission will place notification of this Notice in a local newspaper at the expense of the applicant in accordance with the wetlands regulations, 310 CMR 10.05(5)(a).

I further certify under penalties of perjury that all abutters were notified of this application, pursuant to the requirements of M.G.L. c. 131, § 40. Notice must be made by Certificate of Mailing or in writing by hand delivery or certified mail (return receipt requested) to all abutters within 100 feet of the property line of the project location.

1. Signature of Applicant	2. Date
3. Signature of Property Owner(if different)	4. Date
5. Signature of Representative (if any)	6. Date

For Conservation Commission:

Two copies of the completed Notice of Intent (Form 3), including supporting plans and documents, two copies of the NOI Wetland Fee Transmittal Form, and the city/town fee payment, to the Conservation Commission by certified mail or hand delivery.

For MassDEP:

One copy of the completed Notice of Intent (Form 3), including supporting plans and documents, one copy of the NOI Wetland Fee Transmittal Form, and a **copy** of the state fee payment to the MassDEP Regional Office (see Instructions) by certified mail or hand delivery.

Other:

If the applicant has checked the "yes" box in Section C, Items 1-3, above, refer to that section and the Instructions for additional submittal requirements.

The original and copies must be sent simultaneously. Failure by the applicant to send copies in a timely manner may result in dismissal of the Notice of Intent.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 3 - Notice of Wetland FeeTransmittal Form
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
MassDEP File #:
eDEP Transaction #:1528931
City/Town:STURBRIDGE

A. Applicant Information

1. Applicant:

a. First Name	ELLEN	b.Last Name	HUFFMAN		
c. Organization	DEPARTMENT OF CONSERVATION AND RECREATION				
d. Mailing Address	251 CAUSEWAY STREET, SUITE 600				
e. City/Town	BOSTON	f. State	MA	g. Zip Code	02114
h. Phone Number	4135868706	i. Fax	4137841663	j. Email	ellen.huffman@mass.gov

2.Property Owner:(if different)

a. First Name	PREISCILLA	b. Last Name	GEIGIS		
c. Organization	COMMONWEALTH OF MASSACHUSETTS				
d. Mailing Address	100 CAMBRIDGE STREET				
e. City/Town	BOSTON	f.State	MA	g. Zip Code	02114
h. Phone Number		i. Fax		j.Email	

3. Project Location:

a. Street Address	159 WALKER POND ROAD (WELLS STATE PARK)	b. City/Town	STURBRIDGE

Are you exempted from Fee? ☐ (YOU HAVE SELECTED 'NO')

Note: Fee will be exempted if you are one of the following:

- City/Town/County/District
- Municipal Housing Authority
- Indian Tribe Housing Authority
- MBTA

State agencies are only exempt if the fee is less than $100

B. Fees

Activity Type	Activity Number	Activity Fee	RF Multiplier	Sub Total
J.) ANY OTHER ACTIVITY NOT IN CATEGORY 1,3,4,5 OR 6;	1	500.00	RFA MULTIPLIER 1.5	750.00

City/Town share of filling fee	State share of filing fee	Total Project Fee
$387.50	$362.50	$750.00

STURBRIDGE WETLANDS PROTECTION BY-LAW AND REGULATIONS

WETLANDS FILING FEE CALCULATION WORSHEET

Application Type	Qty	Town Filing Fee	TOTAL
Notice of Intent (NOI):			
Residential – Single Family:			
Accessory (Deck, Shed, Pool Septic)	____	$150	_____
Shoreline Work	____	$150	_____
New Construction	X	$300	300
Residential – Other:			
Subdivision/Multi-Unit	____	$750	_____
Commercial/Industrial:			
New	____	$1500	_____
Redevelopment	____	$1000	_____
Limited Project (as defined in SWB & WPA)	____	Equal to full WPA fee	_____
Alterations – located within Riverfront Area	X	Additional 50% of Fee	150
Application filed after Enforcement Order		Double the Municipal fee	_____
Request for Amended Order of Conditions	____	50% of initial fee	_____
Request for Determination of Applicability (RDA:			
No Wetland Boundary Confirmation Residential:	____	$100	_____
No Wetland Boundary Confirmation All Other:	____	$200	_____
For Wetland Boundary Confirmation **File ANRAD or NOI**			
Abbreviated Notice of Resource Area Delineation (ANRAD):			
Residential – Single Family:	____	$100	_____
All Other: **Base Review**	____	$300	_____
Resource Area Boundary			

Certificate of Compliance (COC):			
Residential:			
Single Family	____	$50	_____
Subdivision or Multi-Unit	____	$150	_____
Commercial or Industrial:	____	$150	_____
If Order of Conditions has Expired	____	Add an additional $150	_____
OOC Extension Request	____	$50	_____
Emergency Certification	_____	$50	_____
(NOI may be required to be filed following issuance of Emergency Cert)			

Local Bylaw Fee (includes Town Filing Fee) **$ _____**

State Filing Fee (from DEP Wetland Transmittal Form) **$ _____**

Total Payable to "Town of STURBRIDGE" **$ _____**

*Additional Consultant Fee may be required for reasons which may include:

- Significant amount of wetland impact;
- Extensive resource areas on a site;
- Lack of information supplied;
- Incomplete plans, reports, forms submitted;
- Supplemental information submitted.

APPENDIX D

DCR Operation & Maintenance Plan

MA Department of Conservation and Recreation
Natural Surface Trails
Operation and Maintenance Provisions
To be included in Wetland Protection Act Filings, and Covered under Orders of Condition

dcr
Massachusetts

Table of Contents

1. Intent of this Operations and Management Plan

The purpose of this is to ensure that routine natural surface trail maintenance on lands under the care and control of the Massachusetts Department of Conservation and Recreation (DCR) can occur efficiently and in a timely manner, in a way that protects and enhances sensitive wetland and rare species resources.

This plan will allow the DCR and its partners and contractors to carry out activities associated with the ongoing maintenance of trail systems, including vegetation clearing, trail tread maintenance, and trail structure installation and maintenance within the trail corridor to protect adjacent sensitive resources.

DCR requests that in accordance with the provisions of 310 CMR 10.53(7) implementation of this operation and maintenance plan be approved by the Issuing Authority as a continuing condition that shall be set forth in the Determination or Order of Conditions and the Certificate of Compliance.

1.1 *The Interests of the Wetland Protection Act*

The Massachusetts Wetlands Protection Act (WPA, MGL, Chapter 131, Section 40) serve the following Public Interests:

To Protect:

- Public and Private Water Supply
- Groundwater Supply
- Fisheries
- Wildlife Habitat
- Land Containing Shellfish

To Prevent

- Pollution
- Storm Damage

Control

- Flooding

1.2 *Public and Natural Resources Benefits of Trails*

Trails provide public access to natural areas in order to promote public health, provide active recreation and non-motorized transportation, and build public appreciation for wetland and other natural resources.

As a species, we protect what we appreciate, and we appreciate what we experience and understand. Trails are critical for building enjoyment, appreciation and understanding of natural environments, and thus vital for the protection of wetlands, rare species habitats and other natural resources; and vital for the protection of the "Interests of the Massachusetts Wetland Protection Act."

1.3 *Trails Avoid and Minimize Impacts to Resources*.

As linear networks - like wetland resource networks - trails, by definition do, will and should intersect with wetland resources.

However, well designed and maintained trails protect the "Interests of the Act" by serving to **Avoid and Minimize** any impacts to wetland and habitat resources. Specifically, trails:

- Direct and concentrate use in land areas that **avoid** and if necessary **minimize** impacts to wetland resources.
- Include structures (i.e. drainage structures, bridges and bog-bridges) that **minimize**
    - erosion and sedimentation,
    - vegetation trampling,
    - soil disturbance and

    - habitat destruction.
- Maintaining trail corridor and trail structures good condition are critical for continuing to avoid and minimize impacts

The value of trails in protecting and building appreciation for wetland resources is recognized within the WPA Regulation, 310 CMR 10. Specifically, :

- 310 CMR 10.02(2)(b)2.a. identify trails (and maintenance of those trails) with a tread width of 36" or less on conservation land as a "minor activity in the buffer zone and riverfront area" not requiring a filing.
- 310 CMR 10.53(3)(j) allows for the approval of "the construction and maintenance of catwalks, footbridges, (…) and observation decks;" including trail bridges, bog bridges, and puncheons provided that "such structures are constructed on pilings or posts so as to permit the reasonably unobstructed flowage of water and adequate light to maintain vegetation."
- 310 CMR 10.53(6) allows for the approval t the construction, rehabilitation, and maintenance of footpaths, bikepaths, and other pedestrian or nonmotorized vehicle access to or along riverfront areas but outside other resource areas, provided that adverse impacts from the work are minimized and that the design specifications are commensurate with the projected use and are compatible with the character of the riverfront area. Generally, the width of the access shall not exceed ten feet of pavement, except within an area that is already altered (e.g., railroad beds within rights of way). Access shall not be located in vernal pools or fenced in a manner which would impede the movement of wildlife.

2. Identifying and Delineating Wetland Resources

Massachusetts is home to a variety of coastal and inland wetlands. Most inland wetlands are areas where groundwater is at or near the surface, or where surface water frequently collects or flows for a significant part of the growing season. In these areas a significant part of the vegetation is made up of plants adapted to life in saturated soil.

While working in the field, DCR and its partners and contractors, with experience in recognizing and delineating wetlands will identify and delineate with **Pink** flagging and bank, lands under water, areas subject to flooding, and bordering vegetated wetlands with wetland plant communities or hydric soils.

Crews will also mark with **Blue** flagging and stakes the exact location of any structures, particularly those portions of structures with ground contact (sleepers and posts).

Crews will observe drainage patterns, banks, hydric soil characteristics and the vegetation communities to determine, to the best of their abilities and training, potential wetland resources.

Specifically, evidence of saturated soils will include water marks on trees, water stained leaves, sediment deposits on plants, vegetation morphology and drainage patterns including larger changes in the landscape such as banks and channels may indicate long-term standing or flowing water.

Crews will also observe the plant community to help identify potential wetland resources along trails. Obligate wetland plants, species that occur >99% in wetland habitats, in Massachusetts include skunk cabbage (Symplocarpus foetidus), broadleaf cattail

(Typha latifolia), and buttonbush (Cephalanthus occidentalis). If these species are observed, it is reasonable to assume the area functions as a wetland. Facultative wetland plants usually occur in wetlands (67-99% of the time) but are occasionally found upland. Examples include silver maple (Acer saccharinum), speckled alder (Alnus rugosa), and sensitive fern (Onoclea sensibilis).

If the proposed project is not already approved under a “Minor Activity in the Buffer Zone” exemption (310 CRM 10.02 (2) (b) 2.), or a Negative Determination of Applicability or an Order of Conditions, then DCR / Proponent shall develop an appropriate permitting packet. This packet will include:

- WPA Form 1: https://www.mass.gov/how-to/wpa-form-1-request-for-determination-of-applicability
- Or WPA Form 3: https://www.mass.gov/how-to/wpa-form-3-wetlands-notice-of-intent
- Accompanying maps (see example below)
- Description of proposed work
- Sketch of proposed work
- Photographs depicting extent of proposed work and associated wetland flagging

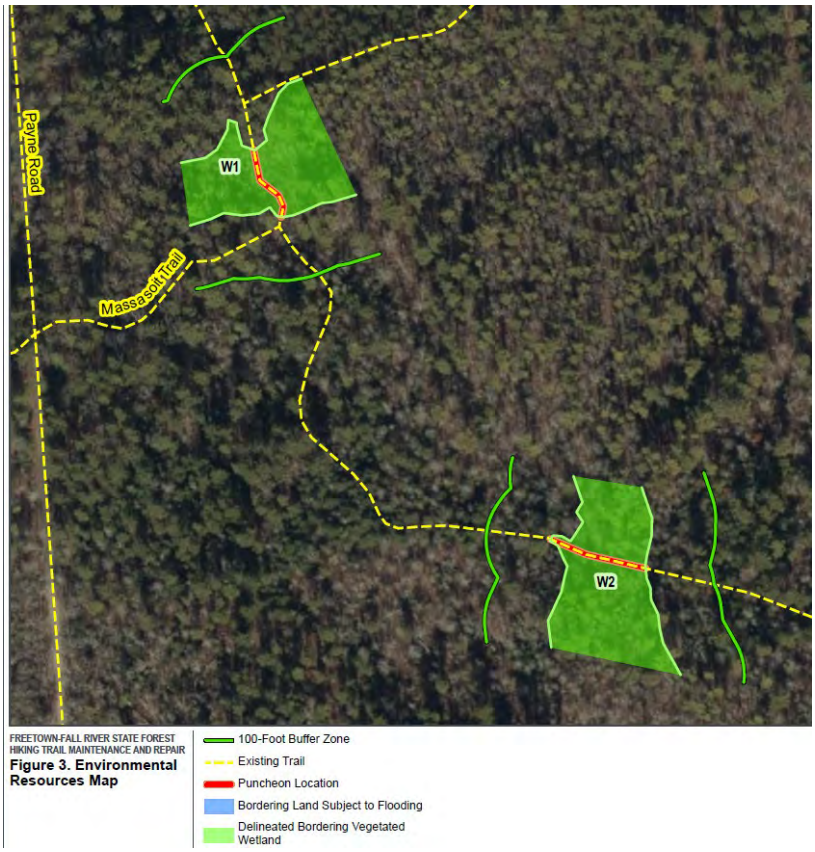
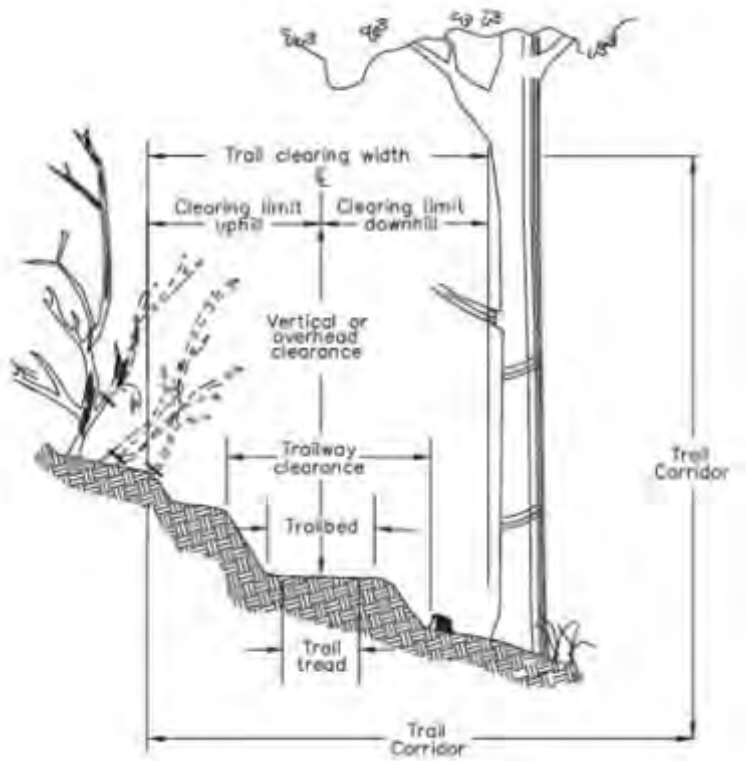


Photo #4 and 5: View of existing trail spanning through Wetland W3. There are no puncheons present through this section of wetland causing foot traffic directly in the wetland.

Photo #6: View of an example of a diamond pier wooden puncheon installed in a wetland.

3. Repair and Maintenance Activities

3.1 *Trail Cross Section and Terms*



3.2 *Trail maintenance activities on DCR's natural surface trails fall into the following nine categories*:

- Trail Corridor Vegetation Clearance
- Trail Tread Maintenance
- Simple Drainage Structure Installation and Maintenance
- Moderate Drainage Structure Installation
- Steep Slope Structure Installation
- Trail Closures
- Trail Reroutes
- Wet Area Crossings
- Minor Stream Crossings (<20')

3.2.1 Trail Corridor Vegetation Clearance

As vegetation falls or grows into the trail corridor, it must periodically be trimmed or removed to maintain a trail corridor clear of obstacles. This activity includes cutting, trimming and removal of vegetation within up to 18" if the existing trailbed width, and up to a vertical height of 6' to 9'. Tree branches that grow into the trail corridor are pruned back to the nearest larger branch or trunk. For trails 36" or less on DCR property, this regular maintenance activity meets the definition of minor activity in buffer zone and

riverfront area (310 CMR 10.02(2)(b)2.a.), in addition, under this plan DCR requests that this activity be confirmed for existing trails greater than 36” wide, and for trail segments that may go through wetland resource areas, and that this maintenance activities does not constitute an alternation.

3.2.2 Trail Tread Maintenance

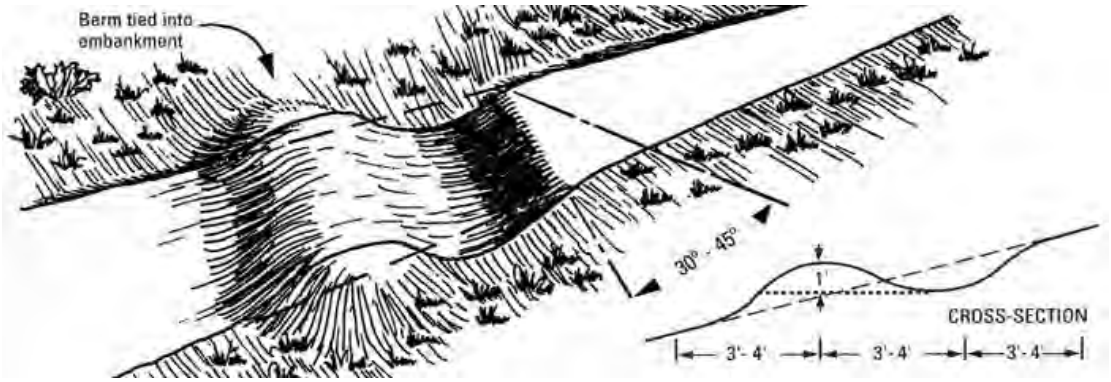
Occasionally, the existing trail tread requires maintenance to remove obstacles, regrade outslopes, and maintain proper drainage and drainage structures. This activity includes removal of obstacles such as stones, roots or small stumps in the existing tread, reshaping the existing tread with hand tools such as shovels and rakes, and bringing in fill to cover exposed roots and rocks and fill mud holes. It does not involve work outside of the existing trailbed.

Eroded trail bed with exposed roots in need of tread maintenance.

For trails 36” or less on DCR property, this regular maintenance activity meets the definition of minor activity in buffer zone and riverfront area (310 CMR 10.02(2)(b)2.a.), in addition, under this plan DCR requests that this activity be confirmed for existing trails greater than 36” wide, and for trail segments that may go through wetland resource areas, and that this maintenance activities does not constitute an alternation.

3.2.3 Simple Drainage Structures (drain dips and water bars)

This activity includes the maintenance of existing and installation of new simple drainage structures within existing trailbed. This may involve digging within the existing tread to a depth of no more than 12 inches to create a drainage dip, and / or the installation of logs, stones or other natural or imported materials to create a water bar. Most work is within the existing tread, but this activity may involve some digging and soil removal within 3' of the existing tread, particularly on the downslope side. Rock water bars may also involve the collection and moving of large stones from the immediate area. Native wood structures may include felling and utilizing local timber. Maintenance involves clearing debris from within the drainage structure and outlet; and reshaping the structure to its original grade and slope.



Trail drain dip

These structures are valuable and necessary to maintain good drainage, minimize and potential for erosion or sedimentation, and protect the Interests of the Act.

Provided that these structures are not constructed within wetland resources areas (other than Riverfront Area), for trails 36" or less on DCR property, this regular maintenance activity meets the definition of minor activity in buffer zone and riverfront area (310 CMR 10.02(2)(b)2.a.), in addition, under this plan DCR requests that this activity be confirmed for existing trails greater than 36" wide, and that this maintenance activities does not constitute an alternation.

3.2.4 Moderate Drainage Structures (Ditches culverts and turnpikes)

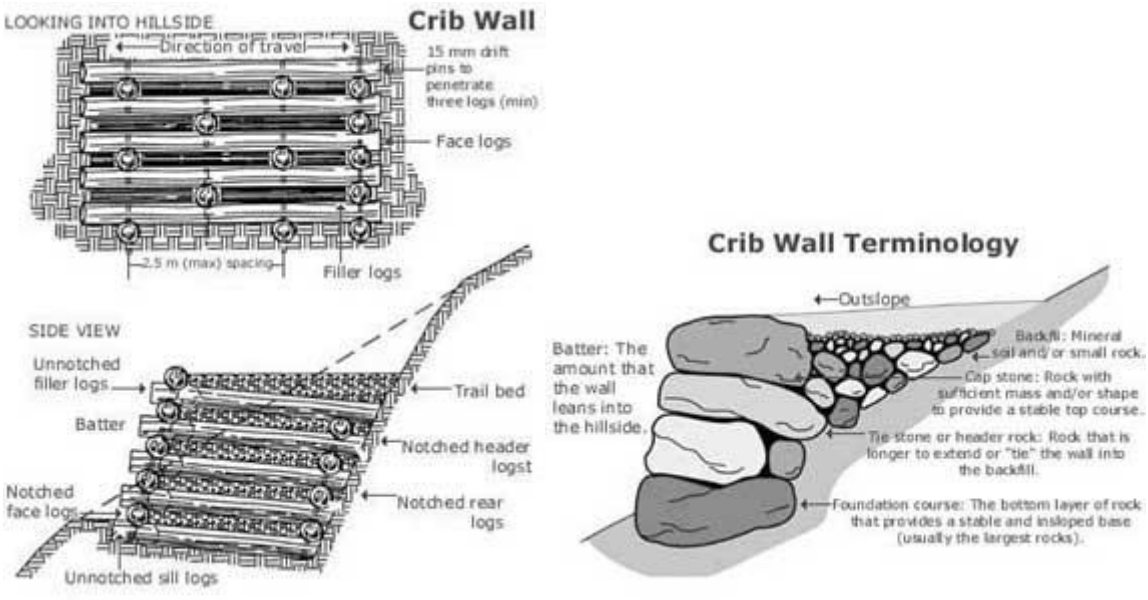
Ditches and culverts may be installed and maintained to move water from one side to another and keep water off the trail. Ditches may be dug to a depth of 12" within 2' of the trail tread. Open cross ditches may be dug across the existing tread and within 3' on either side. Culverts (typically 9" to 12") may be installed digging into the tread (up to 15") and digging and installing rock headers on either end within 3' of the existing tread. Turnpikes lift the trail tread above saturated soil. They are often combined with ditches and culverts to relieve a trail of water from seeps and streams, reduce erosion and provide dry footing. Building a turnpike involves digging a trench on either side of the trail (usually 24-48' apart) and setting stone or logs securely in each trench. Length of

turnpike depends on local conditions. After the parallel rows of rock or logs are in place, the area between is filled with small stones and crushed rock. A layer of mineral soil may be added to the top. Material to build turnpikes may be found from adjacent trail corridor or imported to site.

Provided that these structures are not constructed within wetland resources areas (other than Riverfront Area), for trails 36” or less on DCR property, these structures and their regular maintenance meet the definition of minor activity in buffer zone and riverfront area (310 CMR 10.02(2)(b)2.a.), in addition, under this plan DCR requests that this activity be confirmed for existing trails greater than 36” wide, and that this maintenance activities does not constitute an alternation.

3.2.5 Steep Slope Structures (crib or retaining walls, check dams and steps)

On steeps slopes, retaining walls, check dams and steps are occasionally required to stabilize the trail tread, keep users on the trail and reduce erosion. Retaining walls can help to support turning platforms on switchbacks, shore up trails across rough terrain and steep side slopes, and reinforce the outer edge of a partial bench. Retaining walls may be constructed of either wood or rock. Some excavation will be required establish a footing for the rock or wood. Depth of excavation depends on the slope and size of material used to build retaining wall. Excavated soil may be used for backfill. Rocks and peeled logs are then securely layered to the desired height to create wall. The back of the wall is filled with small stones or crushed rock and mineral soil. Check dams help to slow the flow of water in gullies, allowing silt to build up behind structures and prevent further erosion. They are effective tools for salvaging badly eroded tread and for restoring closed trails and damaged slopes. Check dams are built from large rocks or peeled logs securely installed perpendicular to the tread. Some excavation is necessary to secure rock or logs into the tread way. Filling behind the rock or logs with small stones or mineral soil will allow check dams to be used as steps. Large rocks (weighing from 40-100 lbs), timber and fill material may be obtained locally (see diagrams).



Stone staircase installed by SCA at Mohawk state forest

Provided that these structures are not constructed within wetland resources areas (other than Riverfront Area), for trails 36” or less on DCR property, these structures and their maintenance meet the definition of minor activity in buffer zone and riverfront area

(310 CMR 10.02(2)(b)2.a.), in addition, under this plan DCR requests that this activity be confirmed for existing trails greater than 36” wide, and that this maintenance activities does not constitute an alternation.

3.2.6 Trail Closures

Trails that are seriously eroded, difficult to maintain, and poorly located can impact natural resources values and the user experience. Best management practices may call for closing these trails. Closing an existing trail to prevent future use may involve blocking or disguising the trail with available fallen wood or the felling of nearby trees. Brushing in the closed trails helps to retain leaf litter and soil. Closing may also involve some regrading of the tread to a more natural grade or re-vegetation using local plant material. Closing a trail may even involve installation of check dams to restore damaged slopes.

This activity is ultimately protective of wetland resources. For trails 36” or less on DCR property, this regular maintenance activity meets the definition of minor activity in buffer zone and riverfront area (310 CMR 10.02(2)(b)2.a.). In addition, under this plan DCR requests that this activity be confirmed for existing trails greater than 36” wide, and that this maintenance activities does not constitute an alternation. For trail closures within wetland resource area, this activities constitutes restoration and mitigation.

3.2.7 Trail Re-Routes

Occasionally, trail reroutes are required to improve existing trail conditions that cannot be solved with the above maintenance techniques or to avoid environmentally sensitive areas. Trail reroutes may involve flagging a proposed route, trimming and removal of vegetation, and excavation of organic material and sometimes mineral soil on side slopes to a depth of not more than 12”. Excavated material may be broadcasted on the side of the trail or retained for use as fill. Constructing a re-route may also involve removal of obstacles such as rocks and roots, and installation of the above trail structures. The width of soils disturbance and vegetation clearing is dependent upon designed trail use, but ranges from 12’” to 48” (trail width) and up to 10’ and 18” outside of the trail tread width (vegetation clearance).

Provided that these re-routes are not constructed within wetland resources areas (other than Riverfront Area), for trails 36” or less on DCR property, these re-routes meet the definition of minor activity in buffer zone and riverfront area (310 CMR 10.02(2)(b)2.a.). In addition, under this plan DCR requests that any re-route that better protects adjacent resources be confirmed for existing trails greater than 36” wide, and that this maintenance activities does not constitute an alternation.

3.2.8 Wet Area Crossings (stepping stones, bog bridges, puncheons)

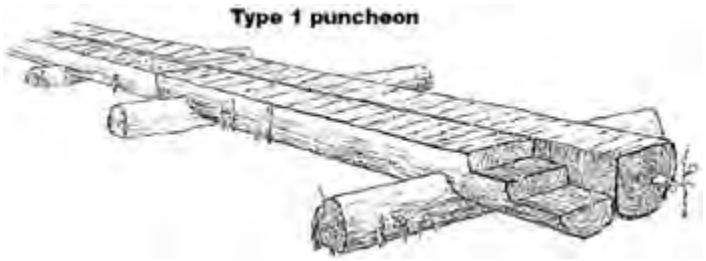
Trails occasionally cross areas that have seasonally saturated soils or wet areas. In order to minimize impacts to vegetation and soils, and minimize trail widening, a number

of different types of structures can be installed and maintained. Stepping stones are simple low-maintenance ways for trails to cross through wet areas. Installation of stepping stones includes excavation of 12’ of soil and setting of a large stone(s) for stepping. Large rocks will most likely be collected from along or nearby the trail corridor.

Puncheon, or bog bridges are simple wooden boardwalk structures. Stone or wooden sills are place on top of or dug into the soils to a depth of less than 6” and a width of 18-36”. Side by side planks, peeled logs or stringers with decking are laid on top of the sills within the existing tread width. These structures keep hikers elevated, effectively protecting wetland soils, minimizing vegetation trampling, allowing for unobstructed flowage of water, and providing adequate light to maintain vegetation. By keeping hikers above saturated soils bog bridges and puncheons minimize trail widening while still allowing users to traverse wetland habitats.

There are three types of puncheons readily used on the east coast.

Type 1 Puncheons are created from natural / native downed timber same as downed woody debris that naturally occur within the wetland. Cut logs are spiked or pinned to the sills on the ground.



Rustic Type 1 Puncheon

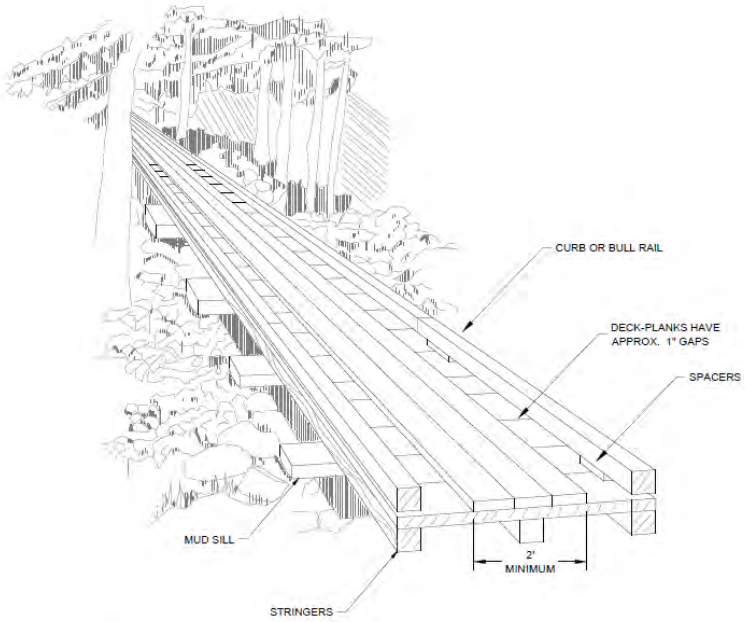
Type 2 Puncheons are made from dimensional lumber with 2.3 to 3 foot long, 6x6” pressure sills and two or three dimensional blanks (2”x10” or 2”x12”) running in the direction of the trail, on 8-foot sections. Sleepers are functionally similar to natural woody debris within the wetland. Each is “di minimus” at approximately 1 square foot.

Type 2 Puncheon Example

Type 3 Puncheons are minimum 36”-wide horizontal decked bog bridge with a curb and ramp up. These decked sections sit on:

- 6”x6” Sills
- Diamond concrete piers
- Helical piles

Type 2 Puncheon Example



PUNCHEON CONSTRUCTION NOTES (Construction notes based on National Park Design Recommendations):

Soil sediment erosion controls are to be installed as shown on plans. Straw wattle shall be used to demarcate the limit of work and act as sediment and erosion control. Straw netting shall be removed- straw may remain- once site is stable.

1. Puncheon :
   - The entire structure must extend to solid mineral soil in order to prevent soft spots to develop at either end of puncheon.
   - Approaches to be straight for at least 10-ft coming up to a puncheon.
   - Mud sills to be made of native logs (cedar, tamarack, locust, or other hard wood material), or short treated planks.
   - Lay mud sills in trenches at both ends of the area to be bridged at intervals of 6 to10-ft. Mud sills to be buried in firm ground approximately two-thirds embed depth. If firm footing is not available, use rock and fill to solidify the bottom of the trench, increase the length of the sill log to give it better flotation or use more sills for needed floatation.
   - Stringers to be made of 8-in peeled logs or treated timbers and are set on top of mud sills. Stringers should be at least 10-ft long and matched by length and diameter.
   - Stringers to be set level with each other so that the surface of the puncheon will be level when the decking is added. Three stringers are required. Notch the mud sills if necessary
   - To hold stringers in place use toenail spikes through the stringers to the mud sills or drive Number 4 rebar through holes in the stringers.
   - The decking should be 4 to 5-ft long and placed with the tree growth rings curving down. Leave at least a 3/4-in gap in between decking pieces to allow for water to run off.
   - Do not spike decking to the center stringer as center spikes may work themselves up over time and create obstacles.
   - Add running planks made of untreated lumber. Do not leave gaps between running planks as they can trap mountain bike or motorcycle wheels.
   - Bull rails should be placed along each side of the puncheon for the full length of the structure to keep traffic in the center. Nail spacers between the curb logs and the decking for drainage.
   - Add a bulkhead or backing plate at each end of the structure to keep the stringers from contacting the soil. If the plate stays in place, do not spike it to the ends of the stringers so as to avoid early rot.

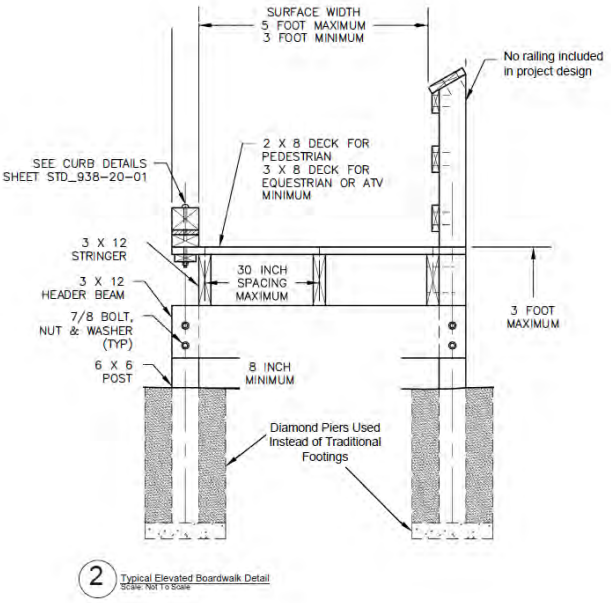
3 TYPICAL PUNCHEON DETAIL

Scale: Not To Scale

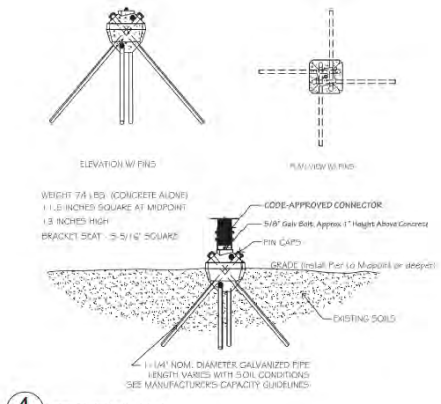
NOTE: CONTRACTOR TO CONSULT WITH OWNER TO MODIFY PUNCHEON DETAIL BASED ON FIELD REQUIREMENTS FOR PUNCHEON TYPE 2 (PUNCHEONS 2 AND 5) AND PUNCHEON TYPE 3 (PUNCHEONS 1, 3, AND 4)

(Refer to DCR Trail Guidelines and Best Practices Guidelines for additional Puncheon notes)

Type 3 puncheon on sills at 5' spacing



2 Typical Elevated Boardwalk Detail
Scale: Not To Scale



4 Diamond Pier DP-75 Design
Scale: Not To Scale

Type 3, Puncheon on Posts and Piers

All three types of puncheon are raised high enough above the ground to provide little interference with the movement of floodwater, and ideally raised one foot in height for each two-feet in width. Type 3 puncheon is the most likely of the three to meet accessibility guidelines. All puncheon maintenance typically involves replacement of rotted sections.

These structures are often constructed across linear projections of bordering vegetated wetland, and thus do NOT meet the definition of minor activity in buffer zone and riverfront area (310 CMR 10.02(2)(b)2.a.).

However, all of these structures are ultimately protective of wetland resources and are designed to have a very minor impact (between 1.5 and 3 square feet per section).

DCR believes that these structures are consistent with the provisions of 310 CMR 10.53(3)(j) “the construction and maintenance of catwalks, footbridges,…” and also that these, even when they constitute a minor alteration, meet the provisions of 310 CMR 10.55(4) under which the commission may permit the alteration of up to 500 square feet of bordering vegetated wetland without replication.

DCR asks the Commission to affirm that puncheon structures described above, meet these provisions and DCR may install and maintenance these structures to protect wetland resources without further replication under this Determination and/or Order.

3.2.9 Minor Stream Crossings (bridges(<25’))

Trails typically cross streams on fords, bridges or culverts. The size of such structures depends on the size of the stream and the surrounding terrain.

DCR occasionally needs to install or replace stream crossings to protect public safety and adjacent banks, streams, and bordering wetlands.

DCR will meet stream crossing standards, installing bridges that meeting the 1.2 times the width from bank to bank. Installation of bridges may include excavation of soils adjacent to the stream bank (but not within any wetland resources area other than Riverfront Area) to install stone, concrete or timber abutments. Bridge stringers are then securely attached to the abutments and then the top is decked. Erosion control will be installed as needed to protect the bank and adjacent resources. Stone and or timber may be collected from the immediate area. Approaches are then graded to provide a

smooth transition to the bridge. Maintenance includes cleaning debris, regrading approaches as needed, and replacement of rotted materials.

3.2.10 Other

Any other project not included in the above descriptions could be permitted under this Management Plan subject to the discretion of the Commission. DCR would review the proposed project with the Commission at a regularly scheduled public meeting to discuss options and design approaches for the project. At that time the Commission could direct the DCR regarding permitting requirements under the State and assess whether the project would require a separate filing or be allowed, with or without conditions, under this Management Plan.

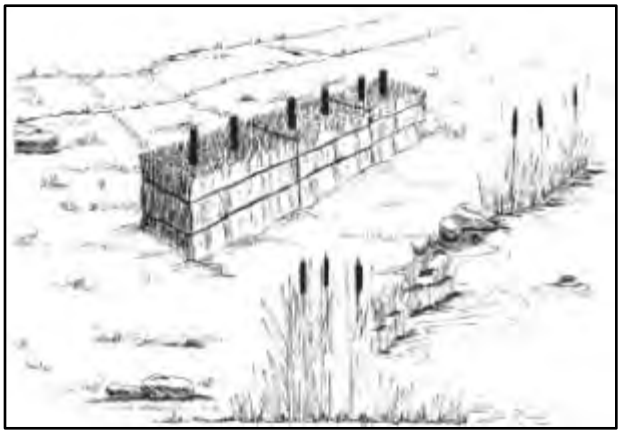
4. Erosion and Sedimentation Control Techniques

If deemed necessary by the Commision, erosion and sedimentation control can be implemented during trail projects to further protect wetland resources. Erosion control is appropriate when erosion will likely occur in the form of sheet or rill erosion or temporary sediment retention is necessary until permanent vegetation is firmly established. Erosion control devices are installed across and at the toe of a slope, usually consisting of straw bales or geo textile materials, to prevent sediment from entering wetlands or open water. Such precautions could include straw bales, straw wattles, or silt fences.

4.1 Straw Bales

Guidelines for bale installation

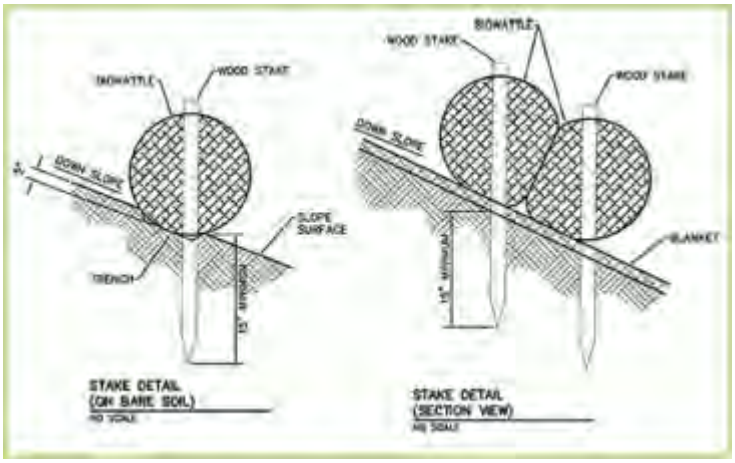
- Bales shall be placed in a single row on the contour with the ends tightly adjoining, not to exceed 600 feet in length.
- Turn up the ends and begin a new row, if needed.
- The bales should be embedded into the ground at least 4" deep.
- After placing bales, they should be anchored in place with two stakes per bale driven through the bale and into the ground.
- Bales should be used where the area below the barrier has exposed soils and would be impacted by water flowing through a barrier.



- Inspections should be frequent. Repair or replacement should be done promptly, as needed.

4.2 Straw Wattles

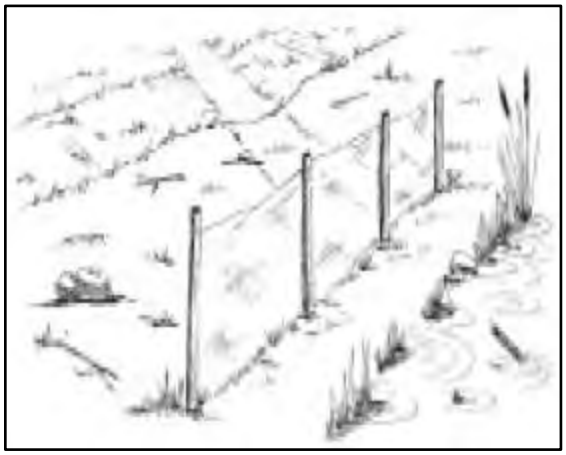
Straw Wattles, also known as straw worms, bio-logs, straw noodles, or straw tubes are man made cylinders of compressed, weed free straw, 8 to 12 inches in diameter and 20 to 25 feet long. They are encased in jute, nylon, or other photo degradable materials, and have an average weight of 35 pounds. They are installed in a shallow trench forming a continuous barrier along the contour (across the slope) to intercept water running down a slope.



Straw Wattles are used on exposed slopes that have less than 30% of the original ground cover remaining and are at risk for increased erosion. They can be installed on slopes up to 70 percent, however their effect diminishes greatly on slopes steeper than 50 percent. Soils can be shallow, but not less than about 8 inches. Straw Wattles increase infiltration, add roughness, reduce erosion, and help retain eroded soil on the slope. Straw Wattles should be effective for a period of one to two years, providing short term protection on slopes where permanent vegetation will be established to provide long term erosion control.

4.3 Silt Fencing

A silt fence is a temporary sediment barrier consisting of filter fabric attached to supporting posts and entrenched in the soil. Silt fence is a sediment control practice, and is intended to be installed where sediment-laden water can pond, thus allowing the sediment to fall out of suspension and separate from the runoff. It is not intended to be an erosion control practice. Improperly applied or installed silt fence will increase erosion. A silt fence detains sediment by ponding water behind it and allowing sediment to settle out.



Silt fence can be used where:

- The slope is gentle, allowing temporary ponding and deposition of sediment;
- Sheet runoff would occur
- The size of the drainage area is no more than 1/4 acre per 100 linear feet of silt fence;
- The maximum flow path length above the barrier is 100 feet (30.5 m);

Guidelines for silt fencing

- If wooden stakes are utilized for silt fence construction, they must have a diameter of 2" when oak is used and 4" when pine is used.
- The filter fabric should be purchased in a continuous roll and cut to the length of the barrier to avoid the use of joints. When joints are unavoidable, filter cloth should be spliced together only at a support post, with a minimum of a six-inch overlap, and sealed.
- When wire support is used, a standard-strength filter cloth maybe used. When wire support is not being used, extra-strength cloth should be used.
- The fabric should be stapled or wired to the fence and a minimum of 4" of the fabric should be extended into the trench.
- The trench should be backfilled and the soil compacted over the filter fabric.

4.4 Additional considerations for erosion control

- Inspect bales and barriers after heavy rains.
- Sediment deposits should be removed when the level of deposits reaches one-half of the height of the bale or the silt fencing.
- Barriers should be removed when the area has revegetated and the barriers are no longer needed. The sediment should be removed or graded out before removal.
- Straw bale barriers require more maintenance than geotextiles due to the permeability of the bales being less than that of silt fencing.
- Silt fences should be removed when they have served their useful purpose, but not before the upslope area has been permanently stabilized.
- For specific information regarding the different types of geotextile materials and their construction and maintenance guidelines, contact the Department of Environmental Services, county conservation district, or a local industrial supplier.

5. Emergency Issues

Any emergency related work determined to be associated with the maintenance of the trail system will follow existing protocol under the Massachusetts Wetlands Protection Act (MGL Ch. 131 Sec. 40) and Regulations at 310 CMR 10.06. In the rare recent that trail conditions pose a threat to public health and safety, such as may result from storm debris blocking trails or stream channels, the regulations require that the work be undertaken at the direction of public agency such as the Commission, carried out according to Soil Conservation BMPs, and completed within 30 days.

APPENDIX E

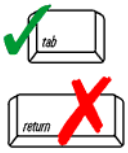
Stormwater Compliance Checklist

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

A. Introduction

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



A Stormwater Report must be submitted with the Notice of Intent permit application to document compliance with the Stormwater Management Standards. The following checklist is NOT a substitute for the Stormwater Report (which should provide more substantive and detailed information) but is offered here as a tool to help the applicant organize their Stormwater Management documentation for their Report and for the reviewer to assess this information in a consistent format. As noted in the Checklist, the Stormwater Report must contain the engineering computations and supporting information set forth in Volume 3 of the Massachusetts Stormwater Handbook. The Stormwater Report must be prepared and certified by a Registered Professional Engineer (RPE) licensed in the Commonwealth.

The Stormwater Report must include:

- The Stormwater Checklist completed and stamped by a Registered Professional Engineer (see page 2) that certifies that the Stormwater Report contains all required submittals.[1] This Checklist is to be used as the cover for the completed Stormwater Report.
- Applicant/Project Name
- Project Address
- Name of Firm and Registered Professional Engineer that prepared the Report
- Long-Term Pollution Prevention Plan required by Standards 4-6
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan required by Standard 8[2]
- Operation and Maintenance Plan required by Standard 9

In addition to all plans and supporting information, the Stormwater Report must include a brief narrative describing stormwater management practices, including environmentally sensitive site design and LID techniques, along with a diagram depicting runoff through the proposed BMP treatment train. Plans are required to show existing and proposed conditions, identify all wetland resource areas, NRCS soil types, critical areas, Land Uses with Higher Potential Pollutant Loads (LUHPPL), and any areas on the site where infiltration rate is greater than 2.4 inches per hour. The Plans shall identify the drainage areas for both existing and proposed conditions at a scale that enables verification of supporting calculations.

As noted in the Checklist, the Stormwater Management Report shall document compliance with each of the Stormwater Management Standards as provided in the Massachusetts Stormwater Handbook. The soils evaluation and calculations shall be done using the methodologies set forth in Volume 3 of the Massachusetts Stormwater Handbook.

To ensure that the Stormwater Report is complete, applicants are required to fill in the Stormwater Report Checklist by checking the box to indicate that the specified information has been included in the Stormwater Report. If any of the information specified in the checklist has not been submitted, the applicant must provide an explanation. The completed Stormwater Report Checklist and Certification must be submitted with the Stormwater Report.

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[1] The Stormwater Report may also include the Illicit Discharge Compliance Statement required by Standard 10. If not included in the Stormwater Report, the Illicit Discharge Compliance Statement must be submitted prior to the discharge of stormwater runoff to the post-construction best management practices.

[2] For some complex projects, it may not be possible to include the Construction Period Erosion and Sedimentation Control Plan in the Stormwater Report. In that event, the issuing authority has the discretion to issue an Order of Conditions that approves the project and includes a condition requiring the proponent to submit the Construction Period Erosion and Sedimentation Control Plan before commencing any land disturbance activity on the site.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

B. Stormwater Checklist and Certification

The following checklist is intended to serve as a guide for applicants as to the elements that ordinarily need to be addressed in a complete Stormwater Report. The checklist is also intended to provide conservation commissions and other reviewing authorities with a summary of the components necessary for a comprehensive Stormwater Report that addresses the ten Stormwater Standards.

Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the item is not applicable (N.A.) and provide the reasons for that determination.

A complete checklist must include the Certification set forth below signed by the Registered Professional Engineer who prepared the Stormwater Report.

Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including the soil evaluation, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan (if included), the Long-term Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement (if included) and the plans showing the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the Stormwater Management Standards as further elaborated by the Massachusetts Stormwater Handbook. I have also determined that the information presented in the Stormwater Checklist is accurate and that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

Registered Professional Engineer Block and Signature

Signature and Date

Checklist

Project Type: Is the application for new development, redevelopment, or a mix of new and redevelopment?

☐ New development

☒ Redevelopment *(Existing Unpaved Recreational Trail Maintenance)*

☐ Mix of New Development and Redevelopment

Checklist for Stormwater Report

Checklist (continued)

LID Measures: Stormwater Standards require LID measures to be considered. Document what environmentally sensitive design and LID Techniques were considered during the planning and design of the project:

- ☐ No disturbance to any Wetland Resource Areas
- ☐ Site Design Practices (e.g. clustered development, reduced frontage setbacks)
- ☐ Reduced Impervious Area (Redevelopment Only)
- ☒ Minimizing disturbance to existing trees and shrubs *(Minimizing disturbance to existing understory and no trees proposed to be removed for drain dips with stable maintained natural buffer.)*
- ☐ LID Site Design Credit Requested:
  - ☐ Credit 1
  - ☐ Credit 2
  - ☐ Credit 3
- ☐ Use of "country drainage" versus curb and gutter conveyance and pipe
- ☐ Bioretention Cells (includes Rain Gardens)
- ☐ Constructed Stormwater Wetlands (includes Gravel Wetlands designs)
- ☐ Treebox Filter
- ☐ Water Quality Swale
- ☐ Grass Channel
- ☐ Green Roof
- ☐ Other (describe): _____

Standard 1: No New Untreated Discharges

- ☒ No new untreated discharges
- ☐ Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth
- ☐ Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.

Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation *Met to the maximum extent practicable.*

☐ Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.

☐ Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.

☐ Calculations provided to show that post-development peak discharge rates do not exceed pre-development rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24-hour storm.

Standard 3: Recharge *Met to the maximum extent practicable .*

☐ Soil Analysis provided.

☐ Required Recharge Volume calculation provided.

☐ Required Recharge volume reduced through use of the LID site Design Credits.

☐ Sizing the infiltration, BMPs is based on the following method: Check the method used.

☐ Static ☐ Simple Dynamic ☐ Dynamic Field[1]

☐ Runoff from all impervious areas at the site discharging to the infiltration BMP.

☐ Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.

☐ Recharge BMPs have been sized to infiltrate the Required Recharge Volume.

☐ Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:

- ☐ Site is comprised solely of C and D soils and/or bedrock at the land surface
- ☐ M.G.L. c. 21E sites pursuant to 310 CMR 40.0000
- ☐ Solid Waste Landfill pursuant to 310 CMR 19.000
- ☐ Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.

☐ Calculations showing that the infiltration BMPs will drain in 72 hours are provided.

☐ Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

[1] 80% TSS removal is required prior to discharge to infiltration BMP if Dynamic Field method is used.

Checklist for Stormwater Report

Checklist (continued)

Standard 3: Recharge (continued)

☐ The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10-year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.

☐ Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

Standard 4: Water Quality *Met to the maximum extent practicable.*

The Long-Term Pollution Prevention Plan typically includes the following:

- Good housekeeping practices;
- Provisions for storing materials and waste products inside or under cover;
- Vehicle washing controls;
- Requirements for routine inspections and maintenance of stormwater BMPs;
- Spill prevention and response plans;
- Provisions for maintenance of lawns, gardens, and other landscaped areas;
- Requirements for storage and use of fertilizers, herbicides, and pesticides;
- Pet waste management provisions;
- Provisions for operation and management of septic systems;
- Provisions for solid waste management;
- Snow disposal and plowing plans relative to Wetland Resource Areas;
- Winter Road Salt and/or Sand Use and Storage restrictions;
- Street sweeping schedules;
- Provisions for prevention of illicit discharges to the stormwater management system;
- Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
- Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
- List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.

☐ A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.

☐ Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:

- ☐ is within the Zone II or Interim Wellhead Protection Area
- ☐ is near or to other critical areas
- ☐ is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)
- ☐ involves runoff from land uses with higher potential pollutant loads.

☐ The Required Water Quality Volume is reduced through use of the LID site Design Credits.

☐ Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.

Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

☐ The BMP is sized (and calculations provided) based on:

- ☐ The ½" or 1" Water Quality Volume or
- ☐ The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.

☐ The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.

☐ A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

Standard 5: Land Uses With Higher Potential Pollutant Loads (LUHPPLs) *Not applicable.*

☐ The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.

☐ The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted ***prior to*** the discharge of stormwater to the post-construction stormwater BMPs.

☐ The NPDES Multi-Sector General Permit does ***not*** cover the land use.

☐ LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.

☐ All exposure has been eliminated.

☐ All exposure has ***not*** been eliminated and all BMPs selected are on MassDEP LUHPPL list.

☐ The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

Standard 6: Critical Areas *Not applicable.*

☐ The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.

☐ Critical areas and BMPs are identified in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the maximum extent practicable

☒ The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:

- ☐ Limited Project
- ☐ Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.
- ☐ Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area
- ☐ Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff
- ☒ Bike Path and/or Foot Path (*See attached NOI*)
- ☐ Redevelopment Project
- ☐ Redevelopment portion of mix of new and redevelopment.

☐ Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.

☐ The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control *See Appendix D of attached NOI for DCR OMP (Section 4).*

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan must include the following information:

- Narrative;
- Construction Period Operation and Maintenance Plan;
- Names of Persons or Entity Responsible for Plan Compliance;
- Construction Period Pollution Prevention Measures;
- Erosion and Sedimentation Control Plan Drawings;
- Detail drawings and specifications for erosion control BMPs, including sizing calculations;
- Vegetation Planning;
- Site Development Plan;
- Construction Sequencing Plan;
- Sequencing of Erosion and Sedimentation Controls;
- Operation and Maintenance of Erosion and Sedimentation Controls;
- Inspection Schedule;
- Maintenance Schedule;
- Inspection and Maintenance Log Form.

☐ A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control (continued)

☐ The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has ***not*** been included in the Stormwater Report but will be submitted ***before*** land disturbance begins.

☒ The project is ***not*** covered by a NPDES Construction General Permit.

☐ The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.

☐ The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

Standard 9: Operation and Maintenance Plan *See Appendix D of attached NOI for DCR OMP.*

☐ The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:

- ☐ Name of the stormwater management system owners;
- ☐ Party responsible for operation and maintenance;
- ☐ Schedule for implementation of routine and non-routine maintenance tasks;
- ☐ Plan showing the location of all stormwater BMPs maintenance access areas;
- ☐ Description and delineation of public safety features;
- ☐ Estimated operation and maintenance budget; and
- ☐ Operation and Maintenance Log Form.

☐ The responsible party is ***not*** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:

- ☐ A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
- ☐ A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

Standard 10: Prohibition of Illicit Discharges *There are no point source discharges associated with this trail improvement and maintenance.*

☐ The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;

☐ An Illicit Discharge Compliance Statement is attached;

☐ NO Illicit Discharge Compliance Statement is attached but will be submitted ***prior to*** the discharge of any stormwater to post-construction BMPs.