

Willis Woods

Trail Plan

*Conservation Works, LLC
and Town of Lynnfield*

September, 2023

WILLIS WOODS TRAIL PLAN

Lynnfield, Massachusetts

September 8, 2023

By

CONSERVATION WORKS, LLC

Introduction: In July 2021, the Metropolitan Area Planning Council (MAPC) awarded a Technical Assistance grant to the Town of Lynnfield to create a vision, and ultimately a work plan, for hundreds of acres of open space at the intersection of the four communities of Lynnfield, Peabody, North Reading and Middleton, in order to protect drinking water resources, provide passive recreation connectivity, and maintain the aggregate area as open space in perpetuity.

The Willis Woods area consists of 700+ acres of wetlands and woodlands with very little development on them save for a few Lynnfield Center Water District (LCWD) well heads and a pumping station for the Lynn Water & Sewer Commission (LWS). Most of the land is under the jurisdiction of the LCWD apart from a few parcels owned by the Lynnfield Conservation Commission and the Essex County Greenbelt Association (ECGA). A large privately owned parcel in the northeast corner is owned by Arkema, a specialty materials manufacturing firm headquartered in Wisconsin, and having a major subsidiary known as Bostik, Incorporated. The Bostik property, with its manufacturing campus located on the Ipswich River in Middleton, currently contains a number of existing trails and presents a potential major access point to the Willis Woods trail network. This planning effort is being led by Lynnfield Planning & Conservation (LPC) in collaboration with the LCWD, the ECGA, and other Town boards and community partners.

To this end, LPC engaged the services of Conservation Works LLC (CW) to prepare a trail plan for this area that promotes more formal and increased access from the surrounding residential neighborhoods, creates a network of looped trails that offer users non-motorized recreational options for their use of the property, respects the larger regional vision for trails and expanded connections and, finally, steers any trail development clear of the LCWD wellheads and LWS pumping station on the property. Further, the LPC has stipulated that all trails developed on the parcel will be for pedestrian use only and motorized vehicle use will be prohibited. Hunting is currently not allowed in Lynnfield

unless an individual property owner grants permission for this activity. Conservation Commission regulations do not allow hunting on its lands. However, other landowners in Willis Woods should formally decide if hunting in any form will be allowed on their properties.

Existing Conditions: Given that the northern boundary of this property is the Ipswich River and given the relatively flat topography, approximately half of the 700+-acre parcel is comprised of DEP-designated wetlands which are scattered throughout the area. These wetlands, along with Willis Brook, help supply fresh water to the Ipswich River. From a trail's perspective, the extensive wetland conditions create significant constraints relative to locating and building a trail network on the property. Nevertheless, the property contains a few miles of existing trails, though they are in "Fair" or "Poor" condition at best. CW found no trails that were in "Good" or "Excellent" condition in our recent survey of the property. (See Map 1: Willis Woods Trails – Existing Conditions, in the Appendix.)

Listed below are the current trails and their condition:

1. **The Old Salem & Lowell RR bed:** This 1.3-mile abandoned railroad bed (shown in blue) in the northern portion of the study area follows an east to west path beginning on the Bostik, Inc. company site and continuing beyond the property/town boundary shared with North Reading. It is the main trunk trail for the northern tier of the property. Access to this trail can be had from both ends of the trail as well as from the bridge that spans the Ipswich River off Elm Street, in North Reading, and from the north-south connector in the middle of the property.

CW rates the condition of this trail as "Fair" because of the extensive "washboard" condition of the tread. Some of the dips are as deep as 18 inches, making travel by bike or walking less than enjoyable. While the tread is in uneven shape, the corridor is relatively clear, although it contains some hazard trees that raise safety issues. Additionally, invasives have grown up along the sides of the trail, blocking views from the trail and crowding out some of the native vegetation.

Several spur trails originating from this trail are all currently used by walkers, dirt bike users, and ATV users. Note: Dirt bike users slide their bikes under the gate off Elm Street to gain access to the property, so the gate does not succeed in keeping motorized users from the property. Additionally, dirt bike users access the rail corridor from Boston Street through the Bostik, Inc. property.

2. **Northwest dirt bike trails:** The northwest corner of the property contains an extensive network of dirt bike trails (shown in red) that run haphazardly through the area and seriously impact the wildlife habitat here. A base of operations has been set up for organized racing here as well. The amount of man-made debris in this natural area is a problem. These trails are in Poor to Fair shape with the overall site being in poor shape. Jump mounds, banked turns, and other man-made features that support dirt bike use are present in this area. This infrastructure needs to be removed from the site as an initial step toward eliminating the unwanted activity.
3. **North-South connector trail:** A dirt bike trail runs north to south through the middle of the property through the wetlands and is, in effect, a 2,000' linear mud hole. This trail is in Poor condition and during normal weather years, typically would have standing water on its tread. (Note: during the unusual drought conditions in 2022, this trail was dry.)
4. **SE hiking trails:** The trails in the southeast portion of the property, which run from Glen Drive east to the Bostik, Inc. land, consist of some informal connector trails running from private abutters to the more established, permanent trails in the area. These informal connector trails have not been mapped because they lead from private property. They see only occasional foot traffic and so are not in bad shape. The more established trails are all-natural surface, pedestrian trails and consist of an east-west trail that flows on the north side of the Lynnfield Woodlot and loops down to the roadway by Well #4 on the west end, and flows east and crosses Main Street ending at the trailhead at the end of the Independence Greenway. This trail is well-established but needs some corridor clearing of downed trees and hazard trees as well as some tread work to fix eroded sections from dirt bike use and ATV use. There are also 2 trails that head north to the old rail bed trail that will require some minor re-routing, some corridor work to clear downed trees, limbs and hazard trees, and some tread work to remove protruding boulders and roots. While these trails are well-established, it does not mean they are in good condition. The informal connector trails may or may not continue to exist, but the east-west trail and the two north-south trails will, most likely, become part of a permanent network. They will require some effort to rise from "Fair" condition to "Good" or better condition.
5. **Informal hunters' trail:** In the western portion of the property, several illegal deer stands were observed, with some of these accompanied by informal, hardly noticeable trails leading to the area. Some of the deer stands are evidently in use,

but since there is no hunting allowed on this property, they should be removed. Once the stands are removed, the trails may cease to exist. Due to the ephemeral nature of these trails, we did not rate their condition, but they appear to have had little impact on the environment.

Map 1: - Existing Conditions in the Appendix shows the location of these existing trails and the abandoned rail corridor and color codes their current condition.

The Trail Plan: Charged with developing a trail plan that provides better public access to the area, expands the miles of trails on the property, develops a network of natural surface, sustainable pedestrian trail loops, steers clear of the LCWD facilities, and prohibits motorized use on the trails, CW visited the site on 5 separate occasions and focused on identifying existing trail resources and access points. Additionally, CW made note of the illegal use currently occurring on the property and explored the possibility for future trails with expanded public access. As a result of this exploration and site survey, CW has designed a trail network containing 1 shared use path (Trail #1) approximately 1.3 miles in length and 6 pedestrian trail loops that would offer over 5 miles of passive recreational walking/hiking. The network allows users to explore every section of the property and all the habitats the property has to offer as well. See **Map 2: Willis Woods Trails - Proposed Trail Network** to view the potential looped trail network and the upgraded rail trail that CW proposes. (Portions of the trail network are located outside the publicly owned Willis Woods lands.)

Approach: Given the size of the property and the extensive work that will be needed to complete the recommended trail network, CW recommends a 10-year, 3-phase trail development plan for the Willis Woods Trail System (see the chart: **"Suggested Work Phasing for the Willis Woods Trail Network"** in the Appendix for a detailed listing of the specific trail projects to be accomplished over the life of the plan). Please note again that formal permission for access by the owners of the Bostik property is a critical component of this trail's development plan. It allows the Town to address the easiest, least costly, and highest priority trail improvements in **Phase I** (envisioned to be completed within 1-2 years of acceptance of the plan). The plan addresses construction of new trails on the property that are buildable and relatively easy to complete in **Phase 2** (3-5 years from acceptance of the plan). These will significantly increase access to the property from surrounding neighborhoods and the overall mileage within the network. Finally, it recommends planning, permitting, and constructing the more challenging sections of the trail system in **Phase 3** (5-10 years from acceptance of the plan). Given the nature of the

projects in Phase 3, this phase could be viewed as an open-ended phase that ends when the last goal is achieved.

Completing this phased approach will result in a network that contains several more miles of trails on which to hike, including (1) more than 1.3 miles added to the Independence Greenway, a shared-use path along the northern tier of the property, (2) a network with six high-quality trail loops built to sustainable trail standards that provide users with access to all of the habitats contained within the property, (3) a network in which all the trails are blazed and have high-quality way-finding signage that provides all users with assurance as to where they are in the network, (4) a network of public access through more locations, and, (5) a network where the user knows what uses are permitted and prohibited on the trails.

Increasing Access: At the end of the plan, the town should have at least 5 good access points to the trail network. CW recommends that three of these should provide convenient parking for those wishing to use the trails. The other two will be readily accessible to nearby residents who will walk to the property. The plan also identifies 3 potential crossing points over the Ipswich River. CW realizes that each of these locations will take considerably more investigation, negotiation, and expense if they are to become reality. Nonetheless, given the increase in property appeal and increase in use that any additional access on the north side of the property would have, the effort to establish these additional access points is highly recommended.

Changing the Use: From the beginning of the implementation of this plan, the Town is calling for a change in the current use of this property. This will meet with resistance from a large group of motorized vehicle users who routinely visit the property. Establishing a "No Motorized Vehicles" environment on the property will take a concerted, dedicated effort to eliminate this group of users from the property. Their long history of abusing this property has given them a sense of ownership and entitlement to the trails and an "aggressive" push-back attitude to being asked to leave. Along with signage, gates, and other barricades, enforcement of the policies and rules of the property by local law enforcement and the State Environmental Police will be much more effective with published maps and adequate signage. CW recommends establishing a phone number or web site where users can report illegal trail use and activities thereby engaging them as trail monitors.

As a reminder, hunting is currently not allowed in Lynnfield, unless an individual property owner grants permission for this activity. Conservation Commission regulations do not allow any hunting on its lands. However, other landowners in Willis Woods should formally decide if hunting in any form will be allowed on their properties.

The Phases:

Phase 1 deals with upgrading the existing trails and trailheads to current and sustainable trail standards and eliminating those trails that cause too much negative environmental impact or are redundant. **Map 3: Phases of Trail Development** shows the trails to be built or upgraded in Phase 1 in *blue*. Those proposed for construction or upgrading in this phase include the following trails:

- **Rail Trail (Trail #1)** – In this phase, CW recommends that this trail be upgraded along its entire 1.3-mile length from the Bostik, Inc. plant to the North Reading town line (formal permission from Bostik, Inc. will be needed for the portion on its lands.) This trail upgrade is recommended for Phase 1 because it is the most significant trail on the property, acting as a trunk trail for the network from which several trail intersections occur. It offers dramatic views and for a relatively modest cost, the Town would get great value.

The upgrade would consist of removing any standing “hazard trees” along the sides of this trail because they threaten the safety of walkers/bikers. At the same time CW recommends removing invasive species along this trail corridor because they threaten native plant and animal species and block some of the more stunning scenic views of the river and woodlands from the trail.

CW recommends re-grading the existing tread to eliminate the extensive “washboard” conditions and create a level, flat walking surface. This should not require gravel fill. CW also recommends crowning this re-graded trail and compacting it to produce a 10’ wide shared -use trail. The grader and compactor could access **Trail #1** from the Bostik, Inc. gate. Ultimately, we believe that **Trail #1 (Rail Trail)** should become an extension of the IG shared-use path coming from the east and have the same surfacing material as used on this trail. For now, **Trail #1 (Rail Trail)** *acts as a critical corridor from which other trails* (Loops # 2, 3, 5, and 6,) *loop around the property.* These include the following:

- **Golf Course Connector (labeled as Trail #4, and also part of the Southwest Loop)** – CW recommends construction of a ~6 car compacted gravel trailhead parking area with kiosk on the south side of the access road to the LCWD water treatment facility off Main Street. Additionally, as part of this project, CW recommends the creation of approximately ½ mile of Class 3 natural surface trail along the west side of the golf course to the future connection with the Loop #3 Trail. This project would also include relocation of a gate beyond the parking area to keep visitors from driving to the LCWD facility.

The trail route along the golf course is relatively open and the ground is relatively free of protrusions, so this segment of trail will be easy and quick to construct. It will provide public access to existing trails to the east (Loop #2 and Loop #3) and future trails to the north and west (Loop # 4). This connector provides safe, easy public access to the existing trail network and the future expansion of the trail system.

- **Glen Drive East Connector** – CW recommends construction of a short, 1/3-mile Class 3 natural surface trail connection from a proposed Glen Drive Trailhead Parking Area to the Golf Course Connector Trail – Trail # 4. Like the Golf Course Connector project, this too would have a ~6-car compacted gravel trailhead parking area a short distance in from the Glen Drive cul-de-sac. It would be on the west side of the road and would require repositioning the existing gate that prohibits the public from driving down the LCWD maintenance road just past the new trailhead parking area. This should be an easy trail construction project. The value of this project is that it will provide formal public access from the densely populated neighborhoods around Glen Drive. This trail would be located away from the maintenance road to keep the road from attracting users.
- **Loop #3 (also labeled as Central Loop)** - CW recommends construction of approximately ¼-mile of Class 3 trail on the western portion of Loop #3. This trail segment will provide the most direct connection from the Main Street Trailhead and the Glen Drive Trailhead to Trail #1. It also completes Loop #3 and will provide a very pleasant hike through the middle of the property. It does require the placement of short lengths of bog bridging along the trail route and a ramped bridge at the intersection of this trail segment with Trail #1. Upon completion, CW recommends closing the existing ‘mud trail’ as depicted on the map with dotted lines by brushing it in with downed tree trunks, limbs, and branches.

- **Way-Finding Signage, Assurance Measures, & Regulatory Signs** – CW recommends that way-finding posts, tree blazing, mini-maps, and intersection numbers be established at the outset to direct users through the new trail system so that the public gets used to the new system from the beginning. CW has found that 6x6 PT posts with numbered maps set at each trail intersection are effective at providing trail directions. These, coupled with colored coded trail blazing, create a very good way-finding system for the network. Given the past use history of the property, CW strongly recommends strategically posting regulation signs (“Do’s and Don’ts”) signage at all access points. It will be advisable to highlight key prohibitions on the trailhead kiosks including “no motorized use,” “no hunting,” and others that seem of particular importance to the land managers).

The proposed work on Phase 1, while expensive, should be fairly simple and easy to accomplish. The permitting issues are also straight forward and should not cause serious delays. The work seeks to upgrade the most significant and most used trails on the property, creates 2 formal public trailheads to the network for the user’s convenience, and makes key trail connections that will dramatically improve access to the property and increase options for the user. It will also open the middle of the property to the public for the first time in many years.

Phase 2 – During this phase of implementation, CW recommends that the Town seek funding to construct the trails depicted in *orange* on **Map 3: Trail Development Phases**. These trails provide critical access from the residential neighborhoods off Lowell Street and important access through some of the most inspiring woodland habitats on the property. CW has scoped out routes for these trails, which are buildable trail segments that should be added to the network. They are in Phase 2 because they will take further communication between the Town and abutters to gauge the neighborhoods’ reaction to the location of these trails. All these trail segments should be natural-surface, pedestrian trails with standard tread widths of 18-24” and standard trail corridors 4’ wide and 8’ high. There is a need for extensive bog bridging on the trail heading west from the Glen Drive Trailhead, but there is no standing water. The bridging will produce a very solid and stable surface on which to walk, run or hike. In some cases, clients have opted to add cleats on top of the planks to provide better traction during icy or wet, slippery conditions. Phase 2 includes the following trails that should be created within the first 5 years of acceptance of this plan:

- **Loop #2** - CW recommends construction of a Class 3 natural-surface, pedestrian loop trail for Loop # 2. This trail loop initially will have two access points – the trailhead parking area planned for Lynnfield Woodlot and the IG trailhead parking on the east side of Main Street. A third access point may become a reality if a new bridge can be constructed at the site of the “old bridge site” shown on Map 2 - Willis Woods Trails – Proposed Trail Network. The trail begins at the Lynnfield trailhead parking area and flows clockwise around the loop, sharing the first 1/3rd of the trail with TRAIL LOOP #3 – THE CENTRAL LOOP. After crossing TRAIL #1 – THE RAIL TRAIL, the two trails proceed north for about 200 feet where they separate, with Loop #2 continuing clockwise along the southern banks of the Ipswich River. Loop #2 turns and heads south on the west side of the Bostik Company chain link fence. It intersects with the southern segment of the trail coming from the west intersection with trail Loop #3. It continues east across Main Street to begin at the IG trailhead parking area, the second access point for this trail. The new layout for this trail can be seen on Map 2. The northern section of this trail along the river runs through some of the most stunning pine woodlands on the property. It will need some bog bridging to pass over a few soft, muddy sections. The western section of Loop #2 needs to be re-routed a bit along with some corridor clearing, and tread work will be needed to produce a sustainable and accessible trail. Similar work, although not the re-routing, will be needed on the eastern segment of Loop #2 and on the section starting at the loop and heading back to Main Street. It should make a spectacular addition to the trail network. For the most part, both the section north of Trail #1 and the section that combines with Loop #3 run through open woodland and will make trail creation in this habitat fairly easy to complete and maintain.
- **Loop #3 (the Central Loop)** – CW recommends upgrading the existing southeast portion of this loop along with some re-routing of the existing layout to eliminate “fall-line” conditions. Additionally, CW recommends a trailhead parking area on top of the knoll of the Lynnfield Woodlot for 6 vehicles.
- **Loop #4 (Southwestern Loop) & Loop #5 (Western Loop)** – CW recommends the construction of a Class 3 natural-surface pedestrian trail in the western segments of Loop #4 and Loop #5 totaling approximately 1.1 miles in length. This trail is intended to run west from the **Glen Drive Trailhead** and ultimately connect to the **Rail Trail (Trail #1)** at the western edge of the property. The Loop #4 section begins by crossing soft, muddy ground, but eventually the loop 5 section runs

through beautiful pine/oak woodlands as it heads west and north to meet the **Rail Trail (Trail # 1)**. It will take some effort to flag the precise location of this trail and to construct approximately 700' of bog-bridging through this wetland area, but it is doable and would make an excellent addition to the trail network. Currently, the proposed trail does not have an access point from North Hill Drive, but that possibility could warrant further research and discussion.

The above work could be done by local volunteers or student conservation groups like SCA (Student Conservation Association) which would greatly reduce the cost of construction. If that is not possible, professional trail contractors like CW or other private trail firms could build these trails. As a hybrid approach, CW has worked with towns on projects like this in which we provide supervision and training to volunteer crews who complete the work that needs to be done.

- **Loop #6 (River View Loop)** – CW recommends upgrading a trail in this northwest section of the property to a Class 3 natural surface pedestrian trail. The trail loop shown on the map is our recommendation for **Loop #6 (River View Loop)**. Note that it shares the trail corridor with **Trail #1 (Rail Trail)** and goes north and south of it as well. We would also recommend eliminating the other trails in this area. To expose users to the valuable habitats of this area, it would be good to have a trail in this region. Because of the habitat destruction that has gone on from the dirt bike trails and their use in this area, CW strongly recommends that the Town consider habitat restoration as part of the trail-elimination process.

This trail can be accessed most easily from the access road and bridge on the south side of Elm Street. This access point currently requires users to climb over the pipe gate to get across the bridge because there is no gap between the gate posts and the stone sidewalls of the bridge. Bike riders need to lift their bike over the gate to continue; hikers climb over or under the gate. As a future action, CW recommends that the Town explore allowing off-road parking along this access road with Lynn Water & Sewer. The gate swingarm could be shortened so that hikers and mountain bikers (but not dirt bikes) can pass through without having to climb over the gate.

- **Lynnfield Woodlot Access** - The access from the Lynnfield Woodlot will be via a ~6-car parking lot, slated for construction completion in the fall of 2023. This is another convenient access point from Main Street, and it will need signage on

Main Street to inform users of its presence and their right to use it to access the trail network. CW recommends this signage for the re-routing of the current fall-line route connection to **Loop #3**. CW suggests a more sustainable route that will lessen the grade of the trail as it connects to **Loop #3**.

Completion of Phase 2 work will nearly complete the trail network. Only the connection of Trail #1 to the IG and the construction of the Loop #4/Loop#5 interior trail remain for new trail segments. The creation of much of the lengths of Loops #2, #3, and #6 and the outer segments of Loop #4 and Loop #5 accomplish a lot for the network by expanding the trail mileage, providing users access to areas they have not had access to for decades, and increasing the options for walkers/hikers/bikers. Those trail loops run through some of the most impressive woodland habitats on the property.

Phase 3 – This phase is meant to address the long-term trail opportunities that the property affords Lynnfield and its neighboring communities. CW recommends that these projects be undertaken in the 5-10- year period after acceptance of this plan. Trails of this phase are depicted in *yellow* on Map #3: Trail Development Phases. The most significant project in this phase is the connection of **Trail #1** to join the IG on the east and continuation of this trail into North Reading on the west as shown on **Map 2: Proposed Trail Network**. One cannot overstate the impact this will have on the use of this property. There is also the matter of providing additional crossings of the Ipswich River to increase access to the trails. While there are three additional options that bear further examination, even one additional access from the north side of the property will represent a significant improvement to the trail network. Phase 3 also includes the possibility of creating a trail for Loop #4 and Loop #5 that provides more options for trail network users.

- **Trail #1 to IG Connection** – This connection has unique issues. There are long-term plans for removal of the Middleton dam owned by Bostik, Inc. The Town of Lynnfield, in collaboration with the Ipswich River Watershed Association and its other partners, sees great benefit in considering post-dam removal trail connections that may run through or around the Bostik property. Bostik's disposition towards the rail trail will go a long way to determining if this conceptual approach can be implemented. It appears that if the current end of the IG is re-aligned and if it is possible to skirt the northern portion of the Bostik property on the south side of the Ipswich River and bend the pathway back down to meet **Trail #1**, a smooth connection could be made (See **Map 3: Willis Woods**

Development Phases). This would be a game-changer for both the Willis Woods trail network and for the Independence Greenway. Discussion with the owners of the Bostik property and a feasibility study would be needed to evaluate the concept. Could a short section of raised boardwalk be built on the banks of the Ipswich River to carry the shared use path around the Bostik buildings to enable the connection? CW recommends preliminary discussions with Bostik, Inc., and permitting authorities to determine if this is possible and whether Bostik, Inc. would allow it to happen. CW would recommend a feasibility study of the route to see if Bostik, Inc. is amenable to it.

- **Loop #2 Upgrade** – CW recommends upgrading the section of the rail trail on Bostik property as well as the easternmost section of Loop #2. It is our recommendation that the Town pursue acquisition of a permanent trail easement from the IG Trailhead parking area to the point where the trail connects with LCWD lands. Outright fee acquisition of the Bostik, Inc. property that contains the trails shown on Map #3 may also be a possibility. Crossing Main Street to reach the west side of the road is potentially dangerous, especially for families with children or youngsters walking alone. CW recommends considering creating a parking area on the west side of Main Street to improve the safety of this access point. While users can access the existing trail from the IG trailhead, they can also access it from the parking area that will be developed at the Lynnfield Woodlot. The initial section of the trail east of the Main Street trail needs corridor clearing and tweaking of the route location, but it is generally in Good condition. Considerable work needs to be done to deal with the water/runoff issues on the trail west of Main Street to create sustainable tread condition, blaze the trail, and make the trail corridor safe from hazard trees. Accessing this section of trail from the IG trailhead parking area has users crossing Main Street to continue west on Bostik, Inc. property and Loop #2. CW recommends trying to establish parking on the northwest side of Main Street for the safety of future users either through negotiations for a parking easement on Bostik, Inc. property or through the purchase of this parcel.
- **Completion of Final Loop 4 and Loop 5 Connector** - CW recommends the creation of a new section of pedestrian trail to create true loops for Loop #4 and Loop #5. This ½-mile section of trail is in the central portion of the property and would complete the western portion of Loop #4 and the eastern section of Loop #5. Because it will travel through extensive wetlands and wet ground, it may need a

small bridge, some elevated boardwalks, and some bog bridging to make it a high and dry hiking corridor. Creation of this trail would dramatically increase the options users have for accessing other portions of the property without having to hike completely around the east side or west side of the site. Since this trail would travel through extensive wetlands, there may be permitting issues as well as expense issues involved with completion of these trail segments.

- **Ipswich River Crossings** - There are three possible crossings in addition to the existing gated bridge used by LWS to access its pump house. One location is in the northwest corner of the property in the location of a former bridge. If this bridge could be re-established and parking provided at the bridge, this would be an important asset to the trail network. Again, further exploration of this possibility along with discussions with permitting authorities and discussion with engineering firms regarding cost estimates would be needed to determine whether this is a viable option for the Town to pursue.

Another option is an existing, decaying bridge east of the LWS bridge. It appears to have been built to sustain vehicle traffic, but the abutments, decking and side rails need repair. Another issue is that the path leading to the bridge appears to come from someone's back yard. Repair of the bridge may be too costly if the access to it runs through private property.

Finally, farther east there exists the potential for a bridge over the narrow section of the river. Access to this site from the north needs to be explored, as there is dense residential housing in the area. The stream is relatively narrow here and it appears that there may have been a crossing here in the past. A bridge here would allow access to the northeast portion of the property, currently accessible only from Bostik, Inc. land.

Summary: The plan lays out a phased approach to creating a trail network that would contain a shared use path and 6 loop trails, increase public access to the property, reduce negative impacts to the property, and involve habitat restoration along with trail construction. The plan includes 3 maps including: "**Map 1:** Willis Existing Conditions", "**Map 2:** Proposed Trail Network", "**Map 3:** Trail Development Phases". The Appendix also contains a chart entitled "Willis Woods Trails – Suggested Work Phasing," which lists by phase all the trail work that CW recommends to create a high-quality, accessible, and sustainable passive recreational trail network on the Willis Woods property along with

estimates of the cost of each task compared with the others and a ballpark figure for the total cost of this plan. Finally, the Appendix includes photos depicting existing trail conditions and some of the proposed sites for new trails.

APPENDICES

MAPS:

Map 1: WILLIS WOODS TRAILS – EXISTING CONDITIONS

Map 2: WILLIS WOODS TRAILS – PROPOSED TRAIL NETWORK

Map 3: WILLIS WOODS TRAILS – DEVELOPMENT PHASES

CHART:

WILLIS WOODS TRAILS – SUGGESTED WORK PHASING

PHOTO DOCUMENTATION:

Plate 1:

PHOTO 1

PHOTO 2

Plate 2:

PHOTO 3

PHOTO 4

Plate 3:

PHOTO 5

PHOTO 6

Plate 4:

PHOTO 7

PHOTO 8

Plate 5:

PHOTO 9

PHOTO 10

Plate 6:

PHOTO 11

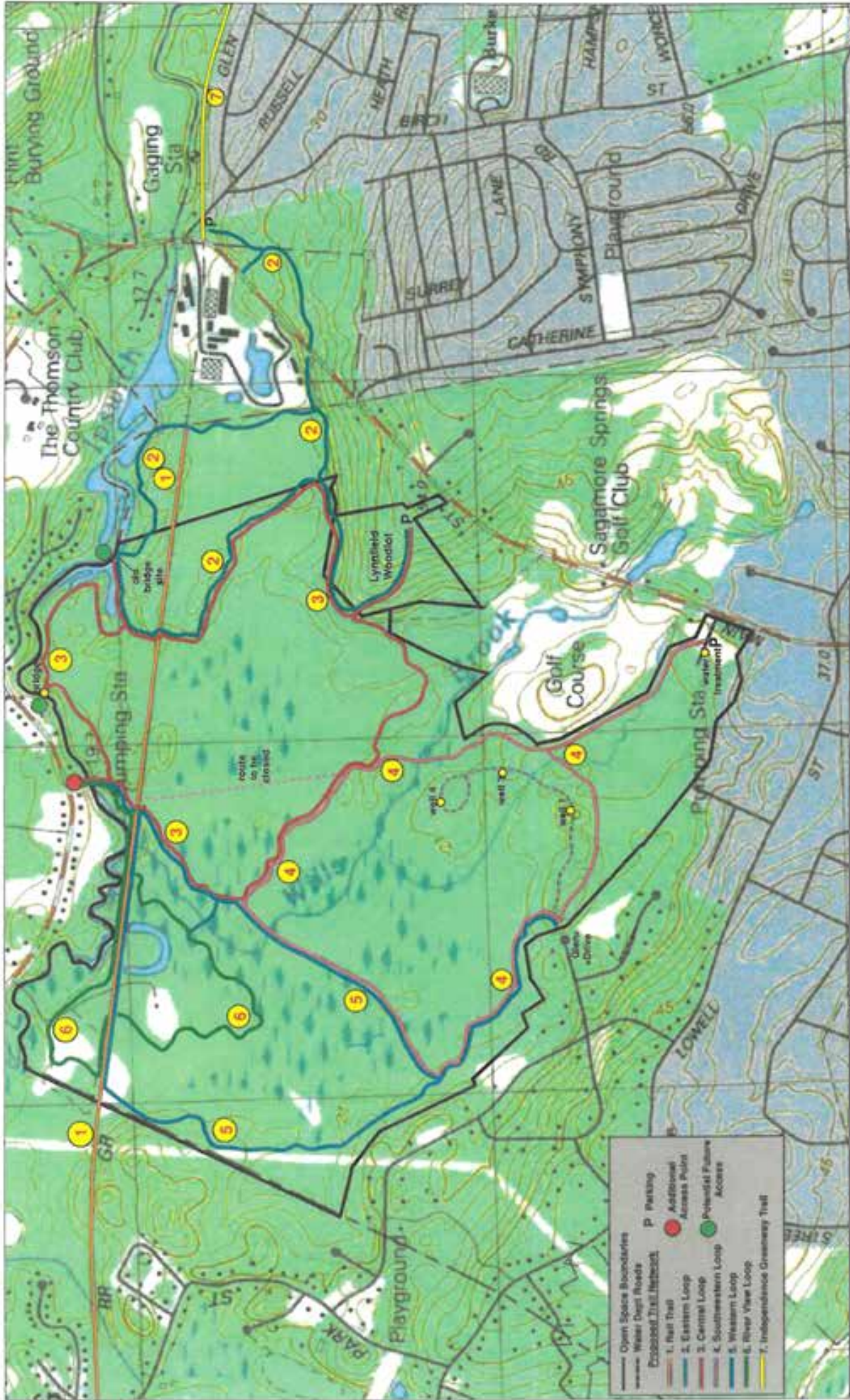
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Map 1. Willis Woods - Existing Trails

Conservation Works - September 2023

0 250 500 1,000 1,500 2,000 Feet

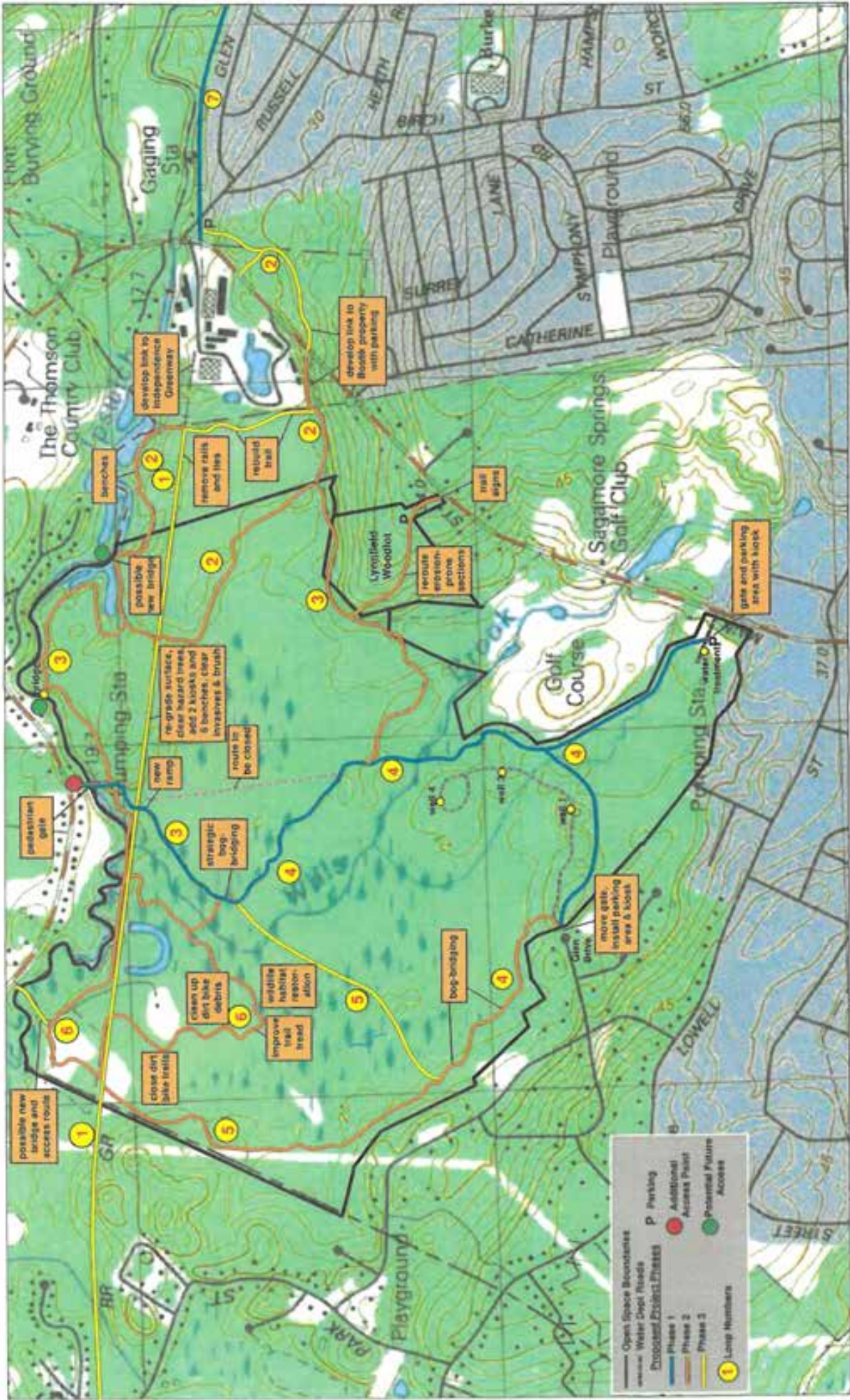


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|--------------------------------|-------------------------|
| Open Space Boundaries | P Parking |
| Water Dept Roads | Additional Access Point |
| Proposed Trail Network | Pulsoidal Flume Access |
| 1. East Trail | |
| 2. Eastern Loop | |
| 3. Central Loop | |
| 4. Southwestern Loop | |
| 5. Western Loop | |
| 6. River View Loop | |
| 7. Independence Greenway Trail | |

0 250 500 1,000 1,500 2,000 Feet

Map 2. Willis Woods Trails - Proposed Trail Network
 Conservation Works - September 2022





Map 3. Willis Woods Trail Development Phases

Conservation Works - September 2022

Willis Woods Trails - Suggested Work Phasing

(Progress on all of these Phases is dependent on funding)

By: Conservation Works, LLC - Revised September 20, 2023

TASK DESCRIPTION	ESTIMATE D COST
PHASE 1 To be completed within 2-3 years from plan adoption	
1. Upgrade Trail #1 to Class 4 trail; 10' wide compacted gravel, shared-use path with kiosks at both ends and benches - 1.3 miles	
a. If Bostik Company approves, remove steel rails and sell as scrap, dispose of old railroad ties on eastern end of trail.	\$ 7,500
b. Clear hazard trees along sides of the 1.3 mile trail route	\$ 5,000
c. Clear invasives & encroaching brush along sides of the trail, open select views	\$ 7,500
d. Install straw wattles - erosion control measures	\$ 15,000
d. Re-grade and compact the surface to eliminate washboard conditions, do not add gravel at this time	\$ 10,000
e. Add small map/information kiosk at both ends of trail	\$ 7,500
f. Add 6 benches at key locations for user enjoyment & benefit	\$ 3,000
2. Construct approximately ¼ mile of Class 3 pedestrian trail along western edge of Sagamore Springs Golf Course creating access to the Southwest Loop Trail	
a. Construct new 6-car gravel parking area on the southwest side of Water District road.	\$ 15,000
b. Construct new, natural surface, Class 3 pedestrian trail across from new parking area to connect to the Southwest Loop Trail	\$ 2,000
c. Re-install gate just after parking area to restrict public access to Pumping Station.	\$ 5,000
d. Install Trailhead kiosk with map panel at this access point	\$ 3,500
3. Construct 1/3 mile of Class 3 pedestrian trail from Glen Road Trailhead to junction with Golf Course Access Trail creating the southern portion of the Southwest Loop Trail.	
a. Build 1/3 mile natural surface, Class 3 pedestrian trail from new Glen Road Trailhead area to connect with Golf Course Access Trail (Refer to "Proposed Trail Network" map for the location of this segment of trail).	\$ 1,500
b. Construct a 6-car gravel parking area on the north side of the existing Wellhead Access Road. Install a Trailhead Kiosk with map panel at this parking area.	\$ 15,000
c. Move the existing gate at Glen Road so it is beyond the new parking area and restricts the public from driving further on this roadway.	\$ 2,500
4. Construct approximately ¼ mile of Class 3 pedestrian trail on the western portion of the Central Loop Trail/eastern portion of the Southwest Loop Trail/northeast portion of WesternLoop Trail	

a. Construct a PT wooden ramp, about 35' long and 4' wide, from Trail #1 down to the tread of Western Loop/Central Loop trails	\$ 10,000
b. Install some 2-plank wide bog bridging as needed (minimal on this trail)	\$ 1,500
c. Construct Class 3, natural-surface trail from Trail #1 to the Glen Road Connector	\$ 2,500
d. Close off "mud trail" from Trail #1 south to Glen Road Connector Trail	\$ 1,000
5. Install Way-finding signage, trail blazes, and regulatory signage consistent with what policies and system will be decided for the trail network	\$ 7,500
TOTAL	\$ 122,500

PHASE 2 To be completed within 5 years of plan adoption

1. Construct a Class 3 pedestrian trail for the northern portions of the Central Trail Loop and the Eastern Trail Loop	
a. Install 2 benches at designated scenic vistas along the Ipswich River and 2 benches in the inspiring pine stands.	\$ 1,000
b. Install a walker-friendly gate at the Elm Street Bridge for ease of access to the property from Elm Street	\$ 7,500
c. Construct approximately 1 mile Class 3, natural-surface pedestrian trail for the northern sections of the Central Trail and Eastern trail loops.	\$ 3,500
2. Connect the new Glen Road Trailhead parking area to Trail #1 along the western boundary of the property.	
a. Install Bog bridging as needed on sections of the Southwest Trail Loop and the Western Trail Loop.	\$ 4,000
b. Construct approximately 1.1 miles of Class 3 trail on the western edge of the Western Loop Trail and the southwest portion of the Southwest Trail Loop.	\$ 5,000
3. Re-route the existing Class 3 trail on the Lynnfield Woods parcel to a more sustainable location	
a. Install signage at the trail entrance from Main Street for user awareness	\$ 250
b. Construct Class 3 trail on east side of Loop #3	\$ 1,500
	\$ 22,750

PHASE 3 To be completed within 10 years of plan adoption

1. Upgrade the River View Loop Trail and restore the destroyed habitat in this area.	
a. Repair the tread on major sections of the River Loop trail	\$ 5,000
b. Engage a Wildlife Biologist to perform a wildlife inventory to see what wildlife is in the area and to recommend a restoration plan for the area	\$ 3,500
c. Implement the recommendations for wildlife restoration.	\$ 5,000
d. Remove all the trash and debris from the dirt bike activities in this area	\$ 3,500
e. Close off all undesired trails	\$ 5,000
2. Re-do the Eastern Loop trail	
a. Establish permanent trails from the Independence Greenway to Willis Woods through discussion and negotiation with the Bostik Company. This effort should consider purchasing the lands from Bostik on which the Eastern Loop trail runs including the southeast section where the trail crosses Main Street.	?

b. If acquired, consider installing parking on the west side of Main Street and have a trailhead for the Willis Woods network here.	\$ 25,000
c. Re-route the western segment of the Eastern Loop trail and close off the redundant trails in this area	\$ 2,580
d. Clear the trail corridor on this Loop and re-work the tread in some areas	\$ 3,870
3. Planning & Design the extension of the Independence Greenway (IG) to Trail #1	
a. Enter into discussions with all stakeholders about connecting the IG with Trail 1 on Willis Woods and what are some of the alternatives to accomplish this task. Conduct a Feasibility Study to accomplish this.	\$ 150,000
b. Implement the approved, permitted design and connect the two trail segments.	\$ 1,000,000
c. Upgrade the surfacing of Trail #1 to be consistent with the IG	\$ 150,000
d. Explore creating a formal access to this trail on the N. Reading end.	\$ 5,000
4. Explore creating 2 new access points off of Elm Street into the property	
a. Explore the two potential bridge sites as possible access routes	\$ 25,000
b. Develop plans for bridges and access corridors if possible	\$ 50,000
c. Construct access corridors and bridges	\$ 100,000
TOTAL	\$ 1,533,450
GRAND TOTAL	\$ 1,678,700

Documentary Photographs Lynnfield Trail Network



Photo 1. The 1.3-mile abandoned railroad bed in the northern portion of the property makes a good anchor for several of the proposed trail loops. We propose that the surface be re-graded to eliminate the frequent dips and washboard condition. Invasive shrubs and occasional hazard trees should be removed.



Photo 2. Old rails will need to be removed from a few hundred yards of the rail bed just west of the Bostik property.

Documentary Photographs Lynnfield Trail Network



Photo 3. Loop 7 begins with an existing path along the edge of the Ipswich River just north of the railroad bed.



Photo 4. Farther to the west, Loop 7 parallels the river through open woods.

Documentary Photographs Lynnfield Trail Network



Photo 5. Most of the trails in the proposed Loop 6 area have been turned into eroded troughs by dirt bikers.



Photo 6. Frequent impromptu barriers have been placed across the present trails in Loop 2.

Documentary Photographs Lynnfield Trail Network



Photo 7. Typical upland woods along the proposed route in the western part of Loop 3.



Photo 8. This bridge connects Loop 7 with Elm Street by way of a private property. The bridge itself needs improvements to its abutments.

Documentary Photographs Lynnfield Trail Network

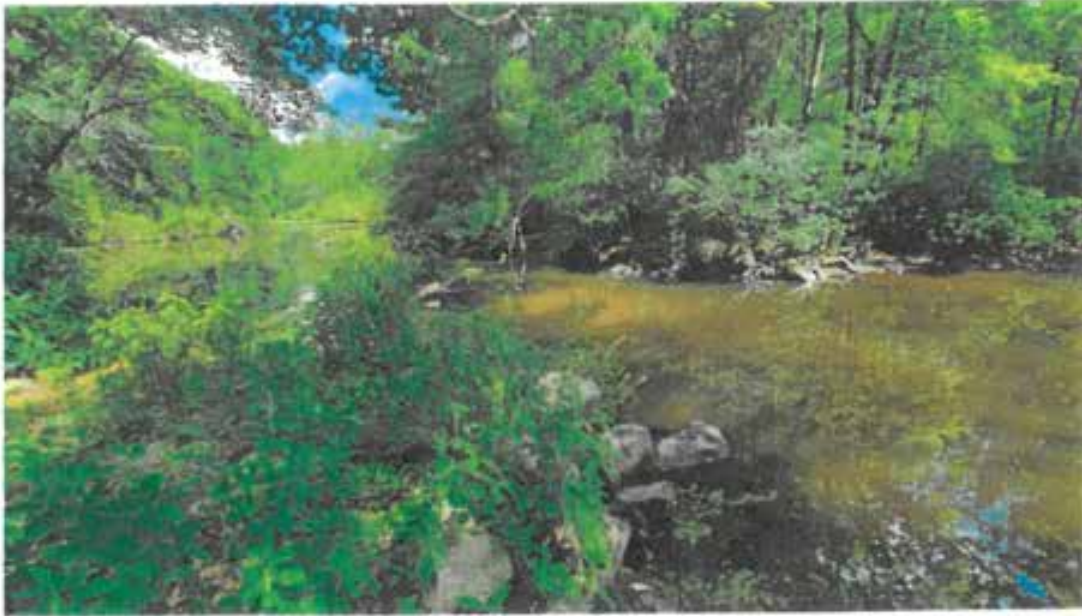


Photo 9. At this site on the Ipswich River, where a former bridge was located, a new bridge connecting Loop 7 with the side roads south of Elm Street might be built.



Photo 10. A new route through the western part of Loop 5, just east of the East Reading town boundary, would pass through attractive woods and clearings.

Documentary Photographs Lynnfield Trail Network



Photo 11. At this point on the north side of the rail trail (trail route 1), an observation bench or platform could be installed to provide good views of the Ipswich River.



Photo 12. Typical upland woods of the south part of Loop 4, north of Glen Road. Bog-bridging will be needed for a few wet spots on this route.