# HABITAT EVALUATION AND RECOMMENDATIONS for WATER STREET GARDEN AND PARK

Submitted to Waterville Community Land Trust by Janet McMahon, Ecologist



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by:

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October 2020

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#### INTRODUCTION

Water Street Garden and Park is an approximately 2-acre property located on the west shore of the Kennebec River in the city of Waterville, Maine. The Park has 242 feet of frontage on Water Street and about 325 feet of frontage on the river<sup>1</sup>. The Water Street neighborhood that borders the park is about one mile from the south end of Main Street in downtown Waterville.

The property was acquired for the following purposes:

- To preserve the natural floodplain along the Kennebec River and maintain and improve the property for bird and other wildlife habitat
- To provide education and nature appreciation opportunities for local school children and others by creating a meandering trail with boardwalk and bridges, and a pergola and benches on the upper level
- To create a community garden area for local residents
- To provide ADA access to the river

The Park is remarkably diverse for its size, due to an abundance of microhabitats ranging from the cleared park area along Water Street to seasonally flooded land along the Kennebec River. The Park's silver maple floodplain is a beautiful example of this natural community type, with towering maples spreading over a dense carpet of ferns during much of the growing season. Waterville Community Land Trust has developed the road frontage portion of the property to serve as a local park, with lawn, plantings of native and ornamental trees, shrubs and perennials, paving stones, a small parking area, and a bench to honor Charles Poulin, a longtime Waterville resident.

This habitat evaluation was conducted during the spring, summer and fall of 2020 and includes management recommendations for Water Street Garden and Park.

#### Acquisition History and Boundaries

The Water Street Garden and Park property was conveyed to Waterville Community Land Trust in a Warranty Deed from Jeffrey Karter on September 21, 2017 (see Appendix A). Another small parcel (232 Water Street)<sup>2</sup> was conveyed to WCLT by the City of Waterville in a Municipal Quitclaim Deed on December 19, 2017 (BK 12803 PGS 280-281). The Park address is 226 Water Street, and it is shown as lots 69 and 92 on Waterville tax maps 33 and 34.<sup>3</sup>

The property has not been surveyed and the northern and southern boundaries are not clearly marked on the ground. The abutting landowner to the south claims to own land marked as WCLT's on the tax map. Old fencing and some green metal stakes extend from the uplands to the river near this line, which borders a right of way shown on tax map 33 as a "Passway" and on the CAI Technologies location map prepared for WCLT in 2017 (see Appendix A).

 $<sup>1\ {\</sup>rm Water}$  Street frontage is shown on tax maps. River frontage was derived from the deed.

 $<sup>^2</sup>$  The City received the parcel as a gift, arranged by Paula Raymond, chair of the South End Neighborhood Association's Quality of Life Committee. The City tore down a house on the property before selling it to WCLT.

<sup>&</sup>lt;sup>3</sup> Revisions on the 2020 tax map indicate that these lots will be combined into Lot 69 on future tax maps.



Green stake and old fencing near southerly line of property, April 22, 2020

All except the portion of the property that borders Water Street lies within a Class A Shoreland Zone according to the Waterville 2011 Shoreland Zoning Map. This classification subjects the first 100 feet from the normal high-water line of the Kennebec River (about 80% of the property) to restrictions of the Resource Protection District.



# Water Street Garden and Park

1":100' | Topographic Map





# MAP PARAMETERS:



# PRODUCT INFO:

Map produced: Rhumb Line Maps, 2020. Office: 1284 Rt 129 South Bristol, ME 04568. Contact: office@rhumblinemaps.com

www.rhumblinemaps.com

PROJECT CODE:	MAP PREPARED BY:
202005-JMC-WSWM-001	M. Cannavo, B. Meader
CLIENT:	CURRENT DRAFT:
Janet McMahon	2020-10-30

# SOURCES:

Topographic: Maine 1m LiDAR-derived DEM. Hydrography: Open water and flowlines (NHD). Cadastral: Maine GIS Databases. Transportation: Maine DOT and NG\_911 datasets.



## Water Street Garden and Park

## 1":100' | Aerial Map



#### **INVENTORY METHODS**

This project had three phases—landscape analysis, habitat evaluation on the ground, and development of management recommendations. Below I briefly describe how I carried out the first two phases, which form the foundation for the management recommendations offered at the end of the report.

#### Landscape Analysis

The following information was collected and analyzed to provide a general understanding of the ecology and land use history of the property:

- Deed, shoreland zoning map and tax maps of the property
- USGS 7.5' topographic map (Waterville)
- National Elevation Model contour map prepared by Rhumb Line Maps
- 2018 leaf-off aerial map prepared by Rhumb Line Maps
- current and historic Google imagery; 1959 SCS aerial photo from WCLT
- bedrock, surficial, and soils maps
- Maine Natural Areas Program data on rare plant, animal, and community occurrences in the vicinity (none documented on the property itself)
- Beginning with Habitat maps
- Correspondence with Nancy Williams of WLCT about current and recent land use
- Maine Historic Preservation Commission review of archaeology and historic resources (none documented)
- Historic topographic maps of the area

#### Habitat Evaluation

The field portion of the evaluation took place on April 22, June 1, August 20, and October 1, 2020. Field work involved walking all levels of the property as well as along the Kennebec floodplain south to the outlet of Messalonskee Stream and north to Lockwood Mill Island Park. Maine Natural Areas Program natural community reconnaissance protocol was used to type and describe the silver maple floodplain forest. Natural community condition, dominant plant species by layer (e.g., canopy, shrub layer, ground layer), environmental site characteristics, and extent of invasive species were documented. In addition, one silver maple tree was cored and notes were taken on slope, aspect and topography, soils, forest age and structure, habitat features and wildlife signs.

Other work included preparation of a baseline species list of plants observed during the natural community inventory (Appendix B), a list of incidental wildlife observations, and a reconnaissance of boundaries, potential access points from nearby parks, and landscape context. Information on land use history was obtained from historical accounts, photos and maps, and conversations Nancy Williams. This information was used to better understand why the property looks the way it does today and inform future management.

#### A BRIEF LAND USE HISTORY

To date, no historic or archaeological sites have been documented on the property by the Maine Historical Preservation Commission. The only site known in the vicinity is at the mouth of Messalonskee Stream, where a mid-20<sup>th</sup> century report documented the presence of stone tools around the stream's outlet (Arthur Spiess, personal communication). According to Spiess, no professional archaeological testing has occurred in the area between Messalonskee Stream and the Hathaway mill site.

The post-European settlement history of the area is pieced together from maps and old aerial photos, and a close look at the land itself. An early 1856 map shows sparse settlement on the Waterville side of the Kennebec, with more structures concentrated on the Winslow side. A grid of roads in the Water Street area and a small cemetery where Pine Grove Cemetery is located today were already in place. The fairgrounds area shown below and other land has since been added to the Cemetery. The floodplain from the Park southeast to the mouth of the Messalonskee was undeveloped until the land was acquired by the Kennebec Sanitary Treatment District in 1949. The passway that is delineated on tax maps may have been provided access to a landing for a ferry that traveled between Waterville and Augusta (Nancy Williams, personal communication).

Job shows the sewage treatment plant and associated graver pis and dump

The sequence of topos on the following page show the progression of development in the area. The 1982 topo shows the sewage treatment plant and associated gravel pits and dump areas.

From 1856 map of Kennebec County, Maine



1943 USGS 15 minute topographic map



1982 USGS 7.5 minute topographic map

#### CURRENT USE AND ACCESS

Water Street Garden and Park is readily accessed off Water Street. A small parking area with room for one vehicle is located near a patio area. There is also room for parking along Water Street. The patio area has a granite bench and a variety of ornamental trees, shrubs and other perennials have been planted around the patio and along Water Street. There is a view to the river when leaves are off the trees. Small temporary informational signs describe work planned for the site. Current use of the Park is light.

A house and smaller structure were located on the property when it was acquired by WCLT. These have been removed. The 1959 aerial photo below reveals that the entire upper level and middle terrace were cleared for pasture and row crops. A small shed is visible in the pasture area. Fencing is visible in the pasture area and there is a drainage ditch between the area with row crops and the pasture area. The cleared area and ditch are still apparent on the 2018 leaf-off aerial on page 3, although the clearing is much smaller in extent and the ditch has partially filled in. Much of the middle terrace has since reverted to a small sedge meadow. Note that the flood plain was forested except for a wide band of marsh vegetation along the shore which likely existed due to higher water levels from the Edwards Dam impoundment.



1959 US Soil and Water Conservation District aerial photo provided by WCLT

The slope below the park has debris from illegal dumping as well as demolition of a house that existed on the property well before it was acquired by WCLT. The slope above the floodplain and the "Passway" along the south boundary are also filled with clay culverts, bricks, a bottle dump and other debris. Annual Kennebec River floods carry garbage and woody debris onto the floodplain as well.

The Park's floodplain forest is beautiful and feels relatively remote. From late summer through early fall bird life abounds, and the river is alive with fish. Much of the shoreline across the Kennebec is forested, offering a scenic view. However, there is no easy access to the middle terrace and floodplain below. The gradient is too steep for walking safely, soils are soft and friable, and invasives such as multiflora rose are thick in places. A "boot leg" rope has been tied between trees at the river edge of the middle terrace down to the silver maple floodplain to give visitors something to hold on to. There is also an unmaintained trail on the northerly side of the boat launch that leads toward the Park and is passable with some bushwacking. The amount of debris on the floodplain makes walking difficult in places.



Hand rope on slope bellow middle terrace

#### NATURAL RESOURCES

#### Topography, Landforms and Geology

The topography of Water Street Garden and Park is complex. It has three tiers, including the cleared park area along Water Street, a level wet area that was once cleared farmland, and the floodplain along the Kennebec River. The land between these three levels drops steeply, with slopes varying from 30 to 50%. Elevation above sea level ranges from about 82 feet at Water Street to 30 feet at the Kennebec River. The land slopes to the southwest.

The property's topography is controlled by sediment deposits rather than bedrock. These

deposits originated during the most recent Ice Age as glaciers retreated from the area around 13,000 years ago. The weight of the ice had pushed down the land surface so that, as the glacier retreated, ocean waters extended far up into the Kennebec valley depositing vast amounts of silt, clay and sand over all of Waterville and as far inland as Bingham, Maine. These deposits, known as the Presumpscot Formation, have since been eroded into the "layers" of sediment that define the topography of Water Street Garden and Park today. Stream deposits laid down annually during spring freshets occur along the Kennebec floodplain. These are referred to as stream alluvium by surficial geologists. Also of interest are the sand and gravel esker deposits to the south on Waterville Sewerage District land. These "rivers of sediment" formed from meltwater streams that flowed under the glacier as it melted and are shown in red on the surficial map below.



Surficial geology of the area, from Weddel and Eckert 2016. Pp = Presumpscot Formation marine clays and silt; Ha = stream alluvial deposits; Pge = esker deposits. The borrow pit symbols indicate sand and gravel mines.

Bedrock lies far below the surface. The two bedrock types underlying the deep marine sediments on the property are part of the Waterville Formation (Osberg 1968). This formation includes thin beds of alternating greenish grey pelite (also called mudstone or shale) and micacious quartzite, a metamorphic rock. Interbedded with these are narrow bands of phyllite. Phyllite is a metamorphic rock that is intermediate between slate and schist (see bedrock map on the following page). The presence of mica crystals give it a silky sheen. No outcrops were observed on the property. Some ledge outcrops are exposed offshore in the Kennebec River during periods of low flow.



Bedrock geology of the area, from Osberg 1968. Lighter purple (Swe) is composed of alternating bands of pelite and micarich quartzite; darker purple (Swls) is composed of limestone and phyllite.

#### Soils

Glacial sediments form the parent material for the soils of Water Street Garden and Park. Two soil types – Hartland and Scio – are mapped on the property (USDA 1978). Hartland soils (HfD) are very fine sandy loams on 15-25% slopes. These are very deep, stone-free, well drained soils that formed on marine sediments that were laid down in the wide Kennebec River valley as the last glaciers retreated. Scio soils (SkB) are very fine sandy loams, on 3-8% slopes that typically occur on terraces adjacent to streams (possibly laid down on an old floodplain of the Kennebec, when water levels were higher). Scio soils are deep, stone-free, moderately well drained, and gently sloping to sloping. Both soil types are considered excellent for forest growth. Soils in the planted area along Water Street are composed of fill that has been brought in.

Both Hartland and Scio soils have a high potential for frost action and steeply sloping Hartland soils are described as having a severe erosion hazard and, as a result, are not considered suitable for roads or trails. The following Soil Conservation map shows the rough boundaries of the two soil types. Note that the soils map shows structures on the property that have since been removed as well as the former cleared area.

Soil type maps are considered approximate. This one does not show the wet soils on the middle terrace of the property. The soils on much of this terrace are mucky and black, and remain saturated through all or most of the growing season.



USDA Soil Conservation soils map (HfD = Hartland soils; SkB = Scio soils)

#### Significant Habitats and Species

#### Silver maple floodplain forest

The floodplain of the Kennebec River supports a classic example of a silver maple floodplain forest community. This natural community type<sup>4</sup> occurs in a narrow band along the Kennebec River and is dominated by silver maple, with white ash scattered throughout. The silver maples are widely spaced, many with multiple trunks, giving the area a park-like feeling. The canopy is mostly closed with trees arching over the river in places. The understory is open and, except for patches of invasives, shrubs are sparse. A lush carpet of herbs changes from spring ephemerals to a dense cover of ostrich and sensitive fern in early summer to ferns, jewelweed, and false nettle later in the growing season. Other typical species present are blue joint, tall meadow rue, and common blackberry. One potentially rare species – hollow-stemmed joe-pye weed (*Eupatorium cf. fistulosum*) – was observed along the upland edge of the northerly end of the floodplain. I observed it late in the growing season when the flowers had mostly gone by. It did have a hollow stem. This species is ranked as S2 and is considered a species of Special Concern by the Maine Natural Areas Program (Maine Natural Areas Program 2012).

<sup>&</sup>lt;sup>4</sup> A natural community is defined as an assemblage of interacting plants and animals and their common environment, recurring across the landscape, in which the effects of human intervention are minimal (Gawler and Cutko 2010).



Silver maple floodplain with ostrich fern in foreground, on June 1, 2020

Silver maple floodplain forests occur on plains flanking low gradient rivers within reach of seasonal floods. These floods regularly deposit nutrient-rich sand and silt on the floodplain and sometimes leave a small raised berm along the river channel. Soils are generally well-drained and dry out quickly on the surface after floodwaters subside. Based on a tree core taken of a typical canopy maple, trees appear to be between 50 and 60 years old, and in the past 20 years or so have been growing more quickly. It's possible that the removal of the Edwards Dam in Augusta may have altered the river's hydrology – decreasing the flood period, thereby resulting in faster growth.

Invasive species are scattered throughout the floodplain and adjacent uplands. In the shrub layer, Japanese knotweed, oriental bittersweet, and multiflora rose are widespread, occasionally forming dense thickets, especially along the upland edge of the floodplain. Invasive trees have also moved in, including Norway maple and box elder. In the herbaceous layer, species typically diagnostic of this community type, such as wood nettle, trout lily and bloodroot are notably absent, likely due to encroachment by invasives and naturalized species.

This natural community type is considered rare in Maine (it has a State Rarity Rank of S3)<sup>5</sup>.

 $<sup>^{5}</sup>$  <sup>5</sup> The Natural Areas Program ranks communities based on an objective analysis of a community's known distribution and abundance in Maine. Each rank code begins with an "S" to indicate that this is its state (as opposed to national or global) rank.

Its rarity is likely due to the fact that most floodplains have been impacted by dams or heavy shoreline development. The example on the Park likely would not be considered exemplary by state standards due to altered hydrology due to the Lockwood Dam just upstream, the presence of invasives, and it's small size. The portion on the property is part of a 30-acre remnant that extends in a nearly contiguous band from the Hathaway mill complex to the mouth of Messalonskee Stream.



Small sedge meadow on middle terrace showing drainage ditch, April 22, 2020

#### Sedge meadow

A small sedge meadow occurs on the middle terrace of the property. This small marsh has been impacted by past cultivation and drainage, but still contains a suite of species associated with wet meadows, including tussock sedge, sensitive fern, bluejoint, as well as other grasses, sedges, rushes, and a few shrubs. Other typical plant species include sensitive fern, common St. Johnswort, flat-topped white aster, and wool grass. The terrain is hummocky. Soils are a combination of organic material and muck and are typically saturated year-round, with standing water present through much of growing season. This was the case, even during the exceptionally dry summer and

State rarity ranks for natural communities follow:

SU/SH Possibly in peril in Maine, but status uncertain; need more information.

S1 Critically imperiled in Maine because of extreme rarity (five or fewer occurrences or very few remaining acres) or because some aspect of its biology makes it especially vulnerable to extirpation from the State of Maine.

S2 Imperiled in Maine because of rarity (6-20 occurrences or few remaining acres) or because of other factors making it vulnerable to further decline.

**S3** Rare in Maine (on the order of 20-100 occurrences).

S4 Apparently secure in Maine.

S5 Demonstrably secure in Maine

early fall of 2020. The source of water is likely groundwater flow from higher ground. If the ditch that drains the area were plugged, the sedge meadow area would likely expand and include small areas of open water that could function as vernal pools. This meadow area is surrounded by dense thickets of invasive shrubs, including multiflora rose and Japanese bamboo, as well as scattered black locust, box elder and Norway maple trees.

#### The river

Water Street Garden and Park lies at the heart of a biologically rich area of the Kennebec, with the Sebasticook River and Messalonskee Stream adding to this richness. For almost 50 years state and federal agencies have been working to restore native anadromous fish to their former habitat in the Kennebec River and its tributaries. Important milestones were the removal of the Edwards Dam in Augusta in 1999 and the Fort Halifax Dam in Winslow in 2008. The resilience of the river has been astounding. The 18 miles of river that were submerged by the Edwards Dam for 162 years today support shad, Atlantic and short-nose sturgeon, striped bass, and the largest run of alewives on the Eastern seaboard (NRCM no date).



View of up Kennebec River from Carter Memorial Bridge

A lift was built in 2006 at Lockwood Dam to carry alewives, salmon and shad over the dam so they can get to spawning grounds upstream (NRCM no date). The Lockwood Dam lift provides only interim upstream fish passage, and has not been properly engineered to provide downstream fish passage (Maine Rivers 2020). A number of groups have been exploring the potential for additional restoration work, including restoring a self-sustaining breeding population of Atlantic salmon in the Kennebec (Maine Rivers 2020). Atlantic salmon in the Kennebec were designated as an Endangered Species in 2008. This would require removal of more dams, including Lockwood Dam in downtown Waterville.

The Sebasticook River frequently supports some of the largest gatherings of bald eagles in the Northeast (NRCM no date). Eagles are a common sight along the floodplain at the Park. In addition to eagles, schooling fish bring an abundance of cormorants, herons, wading birds and waterfowl.

#### Other species documented in the vicinity

Many rare plant species have been documented on floodplains in the vicinity (Beginning with Habitat 2018b). Species to be on the lookout for include narrow-leaf arrowhead, long-leaved bluet, Garber's sedge, horned-beak rush, soft-leaf muhly, and purple clematis.

This portion of the Kennebec River, the Sebasticook River and Messalonskee Stream support 9 of Maine's 10 species of freshwater mussels, including four that are rare. While no rare species were observed on the property, shells of two common species – eastern elliptio and eastern floater – along with many raccoon tracks, were abundant on the shore. Rare species documented in the vicinity include yellow lampmussel and triangle floater in Messalonskee Stream, the Sebasticook and Kennebec Rivers, and tidewater mucket and brook floater in the Sebasticook River (Nedeau et al. 2000).



Freshwater mussel shells, a common sight on the floodplain

The US Fish and Wildlife Service has designated the stretch of the Kennebec in the vicinity of the Park as "high value habitat for priority species" (Beginning with Habitat 2018a) due to the exceptional combination of rare plants, anadromous fish and other animals that occur here.

In addition to species tracked by the state, the floodplain and sedge meadow area provide a

small oasis for a variety of animal species. The following were observed during the four days I spent on the property. While this list includes many species that do well in suburban landscapes, the floodplain likely support many more spring and fall migratory species.

Birds	Mammals
song sparrow (observed, song)	woodchuck (observed)
mourning dove (song)	raccoon (abundant tracks in floodplain)
cardinal (observed, song)	beaver (chewed saplings)
crow (observed, song)	grey squirrel (observed)
mallard duck (flock observed in Kennebec)	chipmunk (observed)
double-crested cormorant (observed swimming)	
American robin (observed, song)	Other
European starling (observed)	sturgeon (jumping)
yellow-rumped warbler (observed)	eastern floater mussel (shells on shore)
bald eagle (observed)	eastern elliptio mussel (shells on shore)
chestnut-sided warbler (song)	minnows schooling
downy woodpecker (observed)	
yellowthroat (song)	
catbird (song)	
goldfinch (observed)	
chickadee (song)	
brown creeper (observed)	
tufted titmouse (observed)	

#### **Invasive Species**

Seven species listed on Maine's official invasive species list were observed on the property as well as two other species that can aggressively colonize disturbed areas – box elder and coltsfoot. Three invasive tree species – Norway maple (Acer platanoides), box elder (Acer negundo), and black locust (Robinia psuedoacacia) occur at the edge of the cleared park area and around the edges of the wet meadow. Box elder and Norway maple are also present in the silver maple floodplain. These species occur as seedlings, saplings and in the canopy and are fast-growing. The most widespread invasive shrubs are multiflora rose (Rosa multiflora), Japanese bamboo (Fallopia japonica), and oriental bittersweet (Celastrus orbiculatus). Multiflora rose and Japanese bamboo form dense thickets and have likely displaced native shrub species, especially in the old field/wet meadow area on the middle terrace and on the steep slopes above and below it. Japanese bamboo thrives on river floodplain, primarily as individual younger plants. Some large vines were climbing trees bordering the uppermost level of the property. Autumn olive (Elaeagnus umbellate), bush honeysuckles (Lonicera morrowii and possibly Lonicera japonica) were found in smaller isolated patches. Most, if not all of these species occur on neighboring land as well.

Invasive species thrive on disturbed soils and are often difficult to eradicate. Clearing along streets and fields, movement of fill for road maintenance, parking areas and the like, and flooding along the river create an environment conducive to invasives. Most species prefer sun and open or edge habitats, but will tolerate some shade. Many species reproduce by seed and vegetatively (through suckers, rhizomes, above ground runners, and even, in the case of multiflora rose, rooting from twig tips). Seeds of most species are eaten and dispersed by birds and mammals, and black locust and multiflora rose seeds can persist in the soil for years. Recent research suggests that some species, such as bush honeysuckles, are expanding with warmer temperatures and higher atmospheric carbon dioxide concentrations (MNAP 2019).



Thickets of multiflora rose and other invasives on the slope above middle terrace

#### MANAGEMENT RECOMMENDATIONS

Management recommendations and issues are summarized below. For each topic, a brief description of the current situation and recommended actions are given.

#### **Preserve Boundaries**

The northerly and southerly property boundaries are currently unclear and unmarked, and a survey has not been done. It is difficult to know when you are on the property. Clearly marked boundaries are necessary for future management, i.e., invasive species removal and control, clearing vistas, locating trails, etc.). It would also be helpful to know who owns the right-of-way or "passway" that borders the south line. This area is currently filled with debris and an old bottle dump. A boundary survey of the north and south lines is recommended, or, at a minimum, a boundary agreement with the abutter to the south (Map 33 Lot 94) who claims to own land that the tax map shows in WCLT ownership.

#### Recommendations

- Complete a boundary survey for the property.
- Once surveyed, using standard boundary marking procedures, blaze and paint property lines or mark with small aluminum markers indicating the land is owned and maintained by WCLT.
- Once marked, inspect boundaries yearly and remark as necessary (in general, painted boundaries should remain visible for about 10 years).
- Determine who owns the right-of-way that parallels the south line.

#### Possible Recreational and Educational Uses

Water Street Garden and Park's urban location makes it readily accessible to a large number of downtown Waterville residents. The property lies about a quarter of a mile upriver from a townowned ballpark, boat launch and picnic area and less than a mile south of Lockwood Park, which has a hiking trail through a silver maple floodplain forest. Thomas's College and Waterville Middle School are each only a mile away as the crow flies.

Current use of the property is light, in part because the Park is new, and because there is little to draw people to it. The steep slopes and soft soils separating the property's three levels will make access to the property's most notable feature – the silver maple floodplain – problematic. Creating a trail here could result in too much use and would conflict with the property's wildlife habitat value. In addition, trail maintenance would require significant volunteer time to remove debris from the annual spring freshet and other flood events.

While the property is small for a stand alone trail system, there is a wonderful opportunity to work with Kennebec Messalonskee Trails and others to create a walking path that connects to the ballpark/boat launch area and Lockwood Park. This could include sidewalks and short stretches in the floodplains of those two areas.

Recreational use of the middle terrace and floodplain would require installation of stairs or

steps, and deep posts due to the softness of the soil. The middle terrace could be accessed where there is a gentler grade perpendicular to the slope near the bench area (which is occassionally used now), but ADA requirements could be difficult to meet. The first step for WCLT, after determining boundaries on the ground, will be to explore and define appropriate uses.

Suggested appropriate uses:

- day use only
- nature observation (on the upper two levels)
- picnicking (on the upper level)
- community gardens (on the upper level, and possibly, a small area on the drier section of middle terrace (near north line)
- hiking if part of a larger trail network that could include sidewalks
- fishing if part of larger trail network (allowed in season)
- leave no trace; carry out what you bring in
- dogs on leash only; especially near wet meadow area and river
- discourage foraging (except perhaps for educational purposes)
- if geocaching is allowed, recommend that it be near upper level

Recommendations

- Establish a stewardship committee for the property ideally collaborating with other local groups.
- Review permitted uses in the Class A Shoreland Zone, which includes about 80% of the property.
- Recruit work crews to clean up debris on property. Host annual clean up of the river floodplain and along Water Street. This clean up could extend to Lockwood Park and boat launch area.
- If community gardens are established, work with town to provide a water supply and have a manager to oversee distribution of plots, compost piles, water supply, annual clean-up, etc.
- It is likely that the area was and continues to be of high value to the Wabanaki people. Reach out to Wabanaki tribes (Wabanaki Reach might be a good place to start) and Maine Historic Preservation Commission to see if an archaeological survey could be done here. If the Wabanaki are interested, they should be involved in planning. It may be that tribal members would prefer to manage the confluence area differently than the conservation community.
- The land use history of the area and ongoing recovery of the Kennebec River/Sebasticook/Messalonskee area are fascinating stories. Signs of past settlement and use are everywhere (dams, apple trees, the Hathaway site, the old ferry landing). Could involve school groups to research this history and work with Kennebec Messalonskee Trails and other groups to create a brochure for the floodplain system between Lockwood Park and the Messalonskee that summarizes its ecological and cultural values. Could consider a 'Museum in the Streets' model, with a focus on both natural and cultural history.

#### **Restoring and Maintaining Native Biodiversity**

Perhaps the most immediate challenge facing WCLT is eradicating invasives, especially

multiflora rose. Invasive plants are displacing native biodiversity, changing soil chemistry, and can pose a hazard to visitors. Eight invasive species were observed on the property during this evaluation, five of which are widespread. In addition, on the floodplain, naturalized species, such as moneywort, are supplanting native ones. Eradicating invasives is a multi-year endeavor, typically involving repeated cutting or burning of sprouts and roots, or applications of herbicides. The MNAP invasive species guide outlines various control methods and Maine Natural Areas Program staff can provide additional information and guidance.

If a goal of WCLT is to preserve native wildlife, overuse could become a problem, given the small size of the Park. The riparian zone along the Kennebec is of particular importance to wildlife. The ostrich fern population there, if discovered by foragers, could easily be wiped out. Striking a balance between maintaining/creating wildlife habitat and providing public access, scenic views, programs, gardens and trails will take careful planning and require active stewardship.

#### Recommendations

- To minimize impacts to wildlife, confine intensive use (gardens, view, trail) to upper section and possibly drier northern portion of middle terrace.
- Fill in drainage ditch on middle terrace and allow wetland to evolve as it will. As invasives are removed, allow drier areas to revegetate with goldenrod, milkweed and other species preferred by butterflies and bees could have a small trail through this butterfly/bee garden and along a portion of the sedge meadow. I believe there are models for this in the Portland area.
- Allow floodplain forest to continue to evolve into a mature uneven-aged condition to create more structural diversity, snags, course woody debris, and natural openings, with no future harvesting.
- Allow snags and blowdowns to remain, except for clearing needed to keep trails open if WCLT decides to put a trail in floodplain area.
- Contact ecologist at Maine Natural Areas Program to visit the site in July-early August to confirm presence of spotted Joe-pye weed. This could be in conjunction with field work in other floodplain areas along the Kennebec, Sebasticook and Messalonskee.
- Collaborate with Maine Rivers, Natural Resources Council of Maine and other groups that continue to work to restore fish passage in the area.
- To create year-round view, thin only invasive tree species (Norway maple, black locust and box elder). Recommend cutting smallest number of trees possible, as roots are helping to stabilize the bank, and to cut only when ground is frozen to minimize soil disturbance. Will need to repeatedly cut sprouts and invasives to maintain a view.
- On the upper level and for bank stabilization, plant only native plants that are well-suited to local habitat conditions. On steep slopes, plant native shrub species, such as hazelnut, viburnums and dogwoods. Will want to research which species are adapted to the soils present.
- Develop a time table and strategy for invasive species removal and monitoring. Multiflora rose can be pulled or cut in any season, but recommend doing so before plants set fruit to prevent further spread. Recommend cutting trees when ground is frozen to minimize soil disturbance.

- Recruit a volunteer invasive species 'patrol' to eradicate and manage invasives.
- Once under control, annually monitor property for invasive plant species. If populations are small, they can be pulled by hand or with a weed wrench, and burned (if in flower). The best time to monitor is in early October, when most herbacious and shrubby plants have dropped their leaves. Invasives tend to keep their leaves longer and most leaves turn a bright yellow-orange color in the fall and are easiest to see then.
- Monitor the Maine Forest Service website (Invasive Threats to Maine's Forests and Trees). Winter moth, emerald ash borer, browntail moth and other insects are moving inland and northward and, in time, could have a major impact on hardwoods in the Park. May want to consider putting insect pheromone traps on trees in the Park.
- Share information with abutting landowners about invasive species to prevent accidental introductions, and cooperate with them to eradicate invasive species on their properties.
- Take climate change into consideration. Annual precipitation in Maine has increased by 15% over the past century and more of it tends to fall as heavy rain. This trend is becoming more pronounced as the climate warms (Fernandez, et al. 2020). This will make the middle terrace wetter, could increase flood magnitude and length in the silver maple floodplain, and could lead to erosion and slumping of steep slopes. Recommend that construction of bridges, boardwalks, stairways and trails are 'overbuilt' to take this into account.

#### Final Thoughts on Open Space Connections

Water Street Garden and Park lies at the heart of a biologically rich area near the center of a major population center. There is potential to use sidewalks and trails to connect the Park to other areas of open space. To the south, restoring riparian and upland habitat at the confluence of the Kennebec River and Messalonskee Stream is recommended (area is outlined in white on the map below).



City-owned land along confluence of Messalonskee Stream and Kennebec River outlined in white (map prepared by WCLT).

This land is owned by the City and connects to the esker that is on Kennebec Sanitary Treatment District land. If the city dump area could be closed, this area would provide not only important wildlife habitat, but scenic views. It is also worth exploring its archaeological significance and collaborating with Wabanaki tribal members to find out if they have an interest in the area.

A bridge over the Messalonskee could connect the confluence area to open space and beautiful riparian habitat adjacent to Thomas College and the Waterville Middle School. A bridge in this area has been discussed by Kennebec Messalonskee Trails, which established a small perimeter trail on City-owned land in the confluence area. This trail has not been maintained (Nancy Williams, personal communication).

In the central portion of this area, nearby cemeteries offer quiet places to walk and good birding. To the north, sidewalks could connect Water Street Garden and Park to Lockwood Park and continue on to the Waterville Riverfront Park. In all, there are more than a hundred acres of relatively undeveloped and readily accessible land that could be connected, restored and protected by collaborating with the City of Waterville, Thomas College, the Waterville Middle School, Kennebec Messalonskee Trails, Wabanaki tribal members, and others. The following aerial gives a rough sense of what is possible.



Map prepared by WCLT

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Maps and Photos consulted:

- Google Earth imagery (1997 to 2019)
- MEGIS 2018 true color leaf-off imagery
- 1959 US Soil and Water Conservation District black and white aerial photograph of Water Street Garden and Park area
- 1892 USGS 15' topographic quadrangle: Waterville
- 1943 USGS 15' topographic quadrangle: Waterville
- 1982 USGS 7.5' topographic quadrangle: Waterville
- 1856 Map of Kennebec Co., Maine (Chace and Shaw)
- USDA Kennebec County Soil Survey on line map
- Maine Natural Areas Program and Beginning With Habitat database National Wetlands Inventory maps: Waterville

#### APPENDICES

A. Legal Documents 2017 Deeds CAI attachment Waterville 2020 tax maps 33 and 34
B. Plants of Water Street Garden and Park

## WARRANTY DEED

Jeffrey F. Karter, of Waterville, County of Kennebec, and State of Maine for consideration paid, grants to Waterville Community Land Trust, Inc., a Maine corporation with a place of business in Waterville, County of Kennebec and State of Maine, with WARRANTY COVENANTS, the land in Waterville, County of Kennebec and State of Maine with improvements thereon, bounded and described as follows, to wit:

All that certain parcel of land situate in Waterville, County of Kennebec and State of Maine, being more particularly described as follows:

#### Parcel I:

Westerly by the East line of Water Streets Southerly by land formerly of John Lashus, said line extending Easterly from an iron pipe driven in the ground at said Water Street to an old fence thence in a Northerly direction on said old fence formerly of John Lashus until it meets the land formerly of Selina Perry; thence Westerly by land formerly of Selina Perry and land formerly of John Pooler to the Easterly line of Water Street.

Also another piece or parcel of land, with the buildings thereon, situate in Waterville aforesaid, and bounded and described as follows, to wit:

Westerly about sixty-three (63) feet by Water Street, Northerly by land formerly of Hadassah J. Bangs Estate; Easterly about seventy-one (71) feet by land formerly of John Lashus; and

1

Southerly about sixty-four (64) feet by land formerly of John Lashus.

Also another piece or parcel of land situated in Waterville aforesaid and bounded and described as follows, to wit: Street Beginning in the Easterly line of Water at the Northwesterly corner of land now or formerly of Louis Parents thence Easterly along the Northerly line of land now or formerly of Louis Parent seventy-five (75) feet, more or less, to the Northeasterly corner of land of said Louis Parents thence Northerly in a straight line with said Parent's Easterly line to the Southerly line of the Perry land; thence Westerly fifty-five (55) feet to the Northeasterly corner of land formerly of Joseph Thibodeau; thence Southerly along the Easterly line of land formerly of said Thibodeau to his Southeasterly corner; thence Westerly along the Southerly line of land formerly of said Thibodeau to Water Street thence Southerly along the Easterly line of Water Street forty-five (45) feet more or less to the point of beginning.

Also another piece or parcel of land situated in Waterville aforesaid, and bounded and described as follows, to wit:

Commencing at a stake driven in the ground at the Northeast corner of land belonging to one Ouellette, formerly of Baldic; thence Northerly one hundred sixty-two (162) feet in the Easterly line of property formerly of Joseph Thibodeau, to a stake driven in the ground at the Southeast corner of another parcel of land now or formerly owned by the Michaud; thence Northeasterly in the Southeasterly line of property now or formerly of Michaud, and in the Southeasterly line of land of Carl Dubord two hundred seventy-five (275) feet to the Kennebec River at low water mark; thence Southerly along the Westerly shore of the Kennebec River three hundred twenty-six (326) feet more or less to a stake in the Northerly line of property now or formerly owned by Herman Clapprood; thence Westerly in the Northerly line of property owned by Herman Clapprood two hundred eight (208) feet to the point of beginning.

#### Parcel II:

A certain lot or parcel of land with any buildings thereon, situated on the Easterly side of Water Street in Waterville, County of Kennebec and State of Maine, and bounded and described as follows, to wit:

2

Beginning at a point in the Easterly line of Water Street eight (8) feet Northerly of the Northerly side of a dwelling house known as No. 228 Water Street; thence Easterly parallel to and eight (8) feet Northerly of said house fifty (50) feet; thence Southerly about ninety-five (95) feet to land now or formerly of Peter Ouellette; thence Westerly along said Ouellette's Northerly line fifty (50) feet to the Easterly line of Water Street; thence along the Easterly line of Water Street seventyfive (75) feet to the point of beginning.

Being the same premises conveyed to Jeffrey F. Karter by deed of Kaja Holdings, LLC dated July 15, 2013 and recorded in the Kennebec County Registry of Deeds in Book 11448, Page 87.

WITNESS my hand and seal on September  $\underline{21}$ , 2017

**STATE OF MAINE** COUNTY OF KENNEBEC, ss.

September 2/, 2017

Then personally appeared the above named Jeffrey F. Karter, and

acknowledged the foregoing instrument to be his free act and deed.

Before me,

Notary Public Printed Name: Maniel J. My Commission Expires: 6/2

DANIEL J. ECCHER Notary Public, Maine My Commission Expires June 22, 2024





#### APPENDIX B.

#### Plants of Water Street Park and Garden, Waterville, Maine

This preliminary list of plants was compiled during field work conducted between April 22 and October 1, 2020. It provides a baseline that can be added to as others visit or work in the area. Species are grouped by strata and arranged in alphabetical order by Latin name. Nomenclature follows *Flora of Maine* (Vining and Haines 1998). Nonnative, naturalized species are noted with an asterisk and highlighted in blue. Invasive species are followed with (I) and highlighted in red. The letter X = occasional to common; U = uncommon (only a few individuals were seen); D = dominant or diagnostic species for that habitat type; cf = identification not certain.

		Silver Maple	Sedge Meadow/	Garden area/
TREES		Floodplain Forest	Old Field	roadside
Acer negundo (I)	box elder	X	X	X
Acer platanoides (I)	Norway maple	Х	Х	X
Acer saccharinum	silver maple	Х		
Betula papyrifera	paper birch	X (1 observed)		
Fraxinus americana	white ash	X		
Malus sylvestris*	apple			X (planted by WCLT)
Prunus serotina	black cherry	X	X	
Quercus rubra	red oak	X		
Robinia pseudoacacia (I)	black locust		X	X
Tilia americana	basswood	X (1 seedling)		
Ulmus americana	American elm	X (seedlings)		
SHRUBS AND VINES				
Celastrus orbiculatus (I)	oriental bittersweet	Х	X	X
Clematis virginiana	virgin's bower	Х	X	
Cornus amomum	silky dogwood		U	
Corylus cornuta	beaked hazelnut			U
Cragaegus sp.	hawthorne	U (1 observed)		X (planted by WCLT_
Echinocytis lobata	wild cucumber	X		
Elaeagnus umbellata (I)	autumn olive		U	
Lonicera cf. japonica (I)	Japanese honeysuckle		X (adjacent to floodplain)	
Lonicera cf. morrowii (I)	bush honeysuckle			X
Parthenocissus cf quinquefolia	Virginia creeper	X	X	X
Rhus hirta	staghorn sumac		X	
Rosa multiflora (I)	multiflora rose	Х	D	X
Rubus allegheniensis	blackberry	Х	X	
Salix cf. discolor	pussy willow		X	
Solanum dulcamara*	deadly nightshade	X	X	X
Vibernum acerifolium	maple-leaved viburnum	U		

SHRUBS continued		Silver Maple Floodplain Forest	Sedge Meadow/ Old Field	Garden area/ roadside
Viburnum lentago	nannyberry		U	
Vitis cf. riparia	wild grape		X	X
Syringa vulgaris*	common lilac		Х	
HERBS				
cf. Ageratina altissima	white snakeroot	X		
Ambrosia artemisiifolia	common ragweed			X
Amphicarpaea bracteata	hog peanut	X		
Arcticum minus*	common burdock			X
Arisaema triphyllum	jack-in-the-pulpit	U		
Artemisia vulgaris*	common mugwort			X
Barbarea vulgaris*	yellow rocket	X		
Bidens vulgata*	tall beggar-ticks	X		
Boemeria cylindrica	false nettle	D (abundant late in season)		
cf. Brachyelytrum aristosum	northern long-awned wood grass	X		
Calamagrostis canadensis	bluejoint grass	X		
Cardamine pensylvanica	Pennsylvania bitter-cress	X		
Carex cf. gynandra	nodding sedge	X		
Carex stricta	tussock sedge		U	
Chelidonium majus*	celandine			X
cf. Circuta bulbifera	bulblet-bearing water hemlock		U	
Cyperus cf. esculentes	nut flatsedge	Х		
Daucus carota*	Queen Anne's lace			
Digitaria cf. ischaemum*	crab grass			Х
Doellingeria umbellata	flat-topped white aster		Х	
Elymus virginicus	common eastern wild-rye	X		
Epilobium cf. coloratum	purple-leaved willow herb		Х	X
Erigeron annuus*	daisy fleabane			X
Eupatorium cf. fistulosum (rare)	hollow-stemmed joe-pye weed	U		
Eutrochium maculatum	spotted joe-pye weed	X		
Fallopia japonica (I)	Japanese bamboo	X	Х	
Fallopia scandens*	climbing bindweed	X	Х	
Fragaria virginiana	wild strawberry			X
Gallium cf. trifidum	three-petaled bedstraw	X		
Geum aleppicum	yellow avens	X		
Geum canadense	white avens			Х
Glechoma hederacea*	gill-over-the-ground	X		
Helianthus cf. giganteus	swamp or giant sunflower		Χ	
Hypericum perforatum	common St. Johnswort			X

HERBS continued		Silver Maple Floodplain Forest	Sedge Meadow/ Old Field	Garden area/ roadside
Impatiens capensis	jewelweed	D		
Leonurus cardiaca*	motherwort			X
Ludwigia palustris	water purslane	X		
Lycopus americanus	water horehound		X	
Lysimachia ciliata	fringed loosestrife		X	
Lysimachia nummularia*	creeping yellow loosestrife	D		
Lysimachia terrestris	swamp candles	U		
cf. Maianthemum stellatum	star-like false solomon's-seal	X (one clump)		
Malva neglecta	common mallow	X		
Medeola virginiana	Indian cucumber	U (1 observed)		
Mentha arvensis	wild mint		Х	
Myosotis cf. sylvatica*	woodland forget-me-not	X		
Oentheria biennis	common evening primrose			X
Oxalis europaea*	yellow wood sorrel	X		
Persicaria cf. lapathifolia	nodding smartweed	X		
Plantago major*	common plantain			Х
Ranunculus repens*	creeping buttercup	X	X	
Rumex cf. obtusifolius*	bitter dock			Х
Sagittaria latifolia	arrowhead	X (near S boundary)		
Scirpus cf. cyperinus	wooly sedge		U	
Silene cf. vulgaris*	bladder campion			U
Solidago bicolor	white goldenrod			U
Solidago flexicaulis	zig-zag goldenrod		U	
Solidago gigantea	late goldenrod		X	X
Solidago rugosa	rough-stemmed goldenrod		X	
Sonchus cf. oleraceus*	common sow thistle	Х		
Symphyotrichum lateriflorum	calico aster	X	X	X
Taraxacum officinale	common dandelion			X
Thalictrum pubescens	tall meadow rue	X		
Trifolium repens*	white clover			Х
Tussilago farfara*	coltsfoot			X
Typha latifolia	cattail		U	
Uvularia sessilifolia	wild oats	U		
Verbena hastata	blue vervain		X	
Veronica cf. serpyllifolia	thyme-leaved speedwell			X
Veronica officinalis	common speedwell	X		
Viola cf. sorroria	wooly blue violet			X

		Silver Maple	Sedge Meadow/	Garden area/
FERNS AND CLUBMOSSES continued		Floodplain Forest	Old Field	roadside
Athyrium cf. angustum	lady fern	X		
Equisetum cf. arvense	field horsetail		X	
Equisetum variegatum	scouring rush		X	
Matteuccia strutheopteris	ostrich fern	D		
Onoclea sensibilis	sensitive fern	X	D (in wetter portion)	
Parthelipterus novaboracensis	New York fern	X		
Polysticum acrostucoides	Christmas fern	U (1 clump)		