Kinderhook Creek Recreational Resource Inventory

Village of Kinderhook & Village of Valatie

June 2019

NEW YORK STATE OF OPPORTUNITY. Hudson River Valley Greenway

Village of Kinderhook
Birthplace of our 8th President Martin Van Buren

Barton & Loguidice, D.P.C.

Villages of Kinderhook and Valatie
Recreational Resource Inventory
Villages of Kinderhook & Valatie, Columbia County

Technical Report

June 2019

Prepared for
Village of Kinderhook
6 Chatham Street
Kinderhook, NY 12106

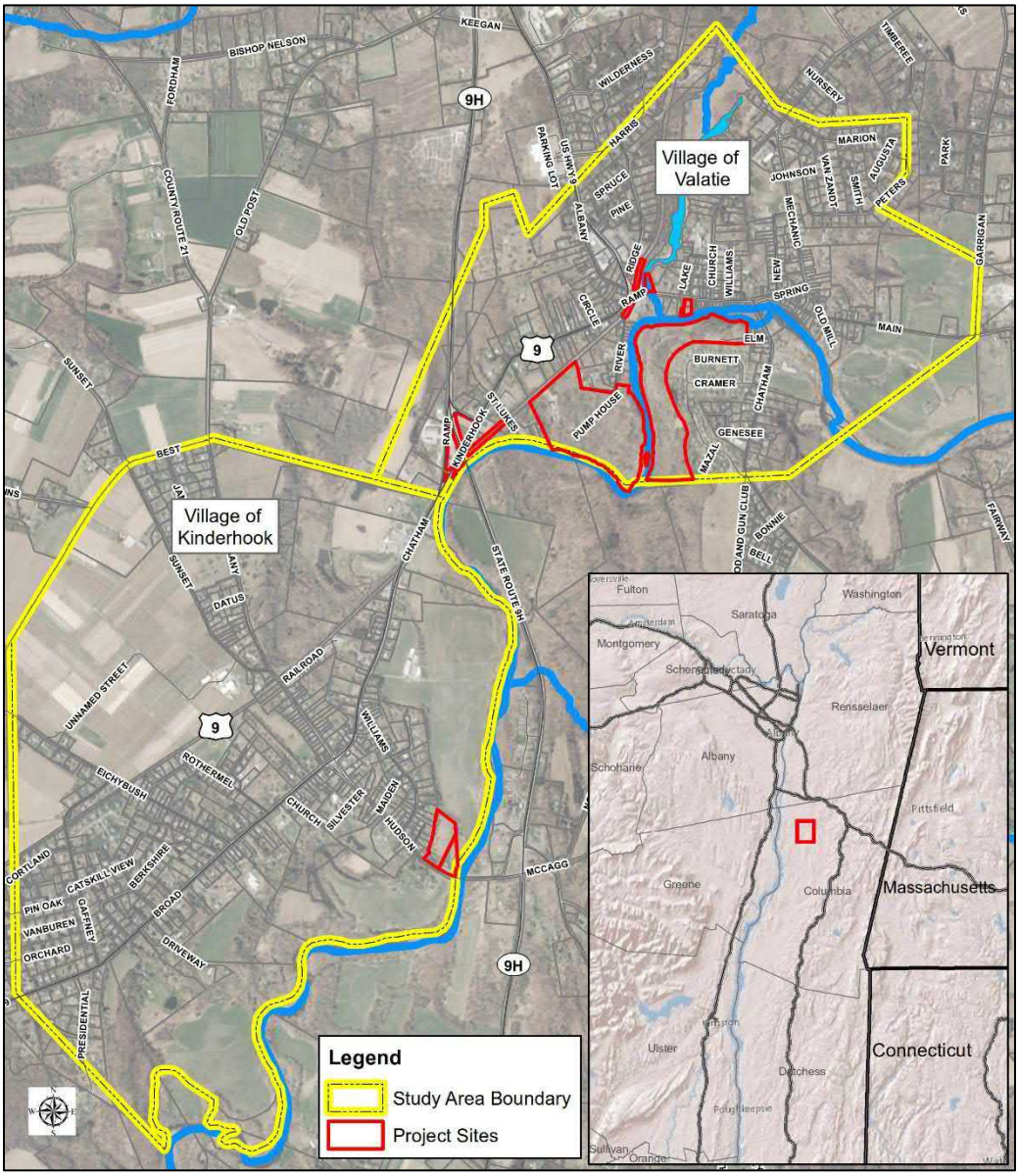
Village of Valatie
3211 Church St
Valatie, NY 12184

Prepared by
Barton & Loguidice, D.P.C.
10 Airline Drive, Suite 200
Albany, New York 12205

Contents

Introduction

On July 27, 2017, New York State designated a portion of the Kinderhook Creek, which runs through the Village of Kinderhook and the Village of Valatie, as an inland waterway. As a response to this designation, the Villages have applied for various types of funding in order to enhance the waterfront. This Recreational Resource Inventory was funded by the Hudson River Valley Greenway and the two Villages. The main focus of this study was to inventory water-based recreation opportunities along the Kinderhook Creek in the Villages.



Map 1 Project boundary and site locations

While the inventory focuses on publically-owned sites, other opportunities can be explored along the creek that would be beneficial to the surrounding communities. The inventory will identify potential enhancements and access to recreational resources around the Kinderhook Creek and it will be used to leverage anticipated funding under the New York Department of State's Local Waterfront Revitalization Program (LWRP).

Together, the Villages of Kinderhook and Valatie have produced a report which displays the partnership of the two municipalities and the value they place on the natural resources which connect them. Through Recreational Resource Committee meetings and two public workshops, four (4) target sites within the Villages have been chosen as the focus of the inventory. In addition, a number of general recommendations for resource preservation and shoreline improvements were generated.

Figure 1 Kinderhook Creek

The four sites chosen for the Recreational Resource Inventory include River Street Park, Pachaquack Preserve, Hudson Street Landing, and the Route 9H Overpass. River Street Park and the Pachaquack Preserve are in the southern part of the Village of Valatie; Hudson Street Landing is in the eastern part of the Village of Kinderhook; and the Route 9H Overpass is within the Village of Valatie but adjacent to the border of the two Villages.

Through the Recreational Resource Inventory, specific projects have been prioritized at each of the four target sites. General Actions have also been produced and are listed in the P*rioritized Actions List & Funding Sources Summary* section of the report. In summary, the general actions include: incorporating a blueway trail map, mileage markers, and related signage system; implementing a shoreline resiliency action plan; incorporating fishery enhancements; and establishing Empire State Trail (EST) trailside maps of Kinderhook Creek and the related recreation opportunities along the creek.

Figure 2 Beaver Falls in Valatie, NY

Data Gathering and Site Inventory

Data gathering for this project was primarily accomplished through site visits, information from local residents, tax map analysis, and GIS mapping. Gathering information using a variety of strategies provides a well-rounded study ranging from analyzing maps to physically visiting the sites. These types of strategies helped produce a more comprehensive recreational inventory of the sites within Kinderhook and Valatie.

Site Visits

Between the first and second Committee Meetings, consultants from Barton and Loguidice (B&L) visited seven (7) potential sites with the mayors of Kinderhook and Valatie. The consultants and the mayors visited River Street Park, Diamond Street, the Pachaquack Preserve, the East Valatie Farm Access, Wilds Pond, Hudson Street Landing, and the Route 9H Overpass. Visiting the sites gave a better understanding of the physical conditions of each target area. Site assessments included generating preliminary ideas of what types of projects could fit within each target area and what sites seemed less feasible to be a part of the inventory. Subsequently, the site visits played a key role in narrowing down the target sites at the second Committee Meeting.

Figure 3 Representatives at the site visit on February 7, 2019

Figure 4 Eroding shoreline at the River Street Park

Significant erosion was observed at all of the visited sites. Portions of the shoreline of River Street Park have significant failures with large trees and root systems toppling into the creek taking large areas of shoreline soils with them. In other areas, deposited silt and gravel have narrowed the stream channel.

Recreational use for boating, fishing, and other water-based activities is adversely impacted by the present conditions. Falling timber creates strainers that are a major risk for boaters. Loss of shoreline and deposition damages fishing habitat and induces flooding further into the floodplain. Trails, structures, and recreational amenities built or placed along low lying areas near erosion are in danger of being lost.

Tax Map Analysis

A tax map analysis was another valuable strategy used to gather data for the project. A tax map displays boundaries, land use, and ownership information of the tax parcels within the two Villages. Understanding property ownership and how it relates to future development opportunities along the Kinderhook Creek is critical when considering future projects. Working with owners of privately owned land can be a more complex process. It is important to engage property owners and work with them to acquire easements and facilitate a vision for the waterfront.

A tax max analysis was critical at the Hudson Street Landing, where the Village of Kinderhook is working with a nearby property owner to attain privately owned land for public recreational use. This analysis also was influential in eliminating Wilds Pond as a target site since most of the site is privately owned. *(See Map 7 in the Appendix)*

Figure 5 A historical postcard of Wild's Pond Falls in Valatie, NY. This site was eliminated during the tax map analysis due to private property conflicts and environmental hurdles related to the dam.
Source: http://www.veravalatie.com/Valatie_Historical_Image.html

Knowing the surrounding land uses and boundaries of the parcels is also critical in developing a recreational inventory. Future development can have an impact on surrounding properties and their easements, so it is imperative to know the land uses and conditions of the properties around the target sites. This was critical in identifying where easements could connect to other recreational opportunities, such as making

connections from River Street Park to the Albany Hudson Electric Trail (AHET). *See map 8 in the appendix.*

GIS Mapping

GIS mapping for the project primarily involved gathering historic and natural resource information, topographic data, and other data. *(See maps 8, 9, and 10 in the appendix)* Similar to the tax map analysis this strategy also helps identify the proximity of the target sites to points of interest such as nearby roads and the AHET.

Analyzing contour data can help guide what types of development can or cannot take place. Areas with steep slopes will require more extensive analysis of the types of feasible projects compared to an area that is flat. Sites such as Diamond Street and the Pachaquack Preserve had areas of steep slopes dropping down to the creek. Proposed projects in those areas included kayak slides to access the creek, fishing/viewing platforms over the creek, and preserving/stabilizing the shoreline.

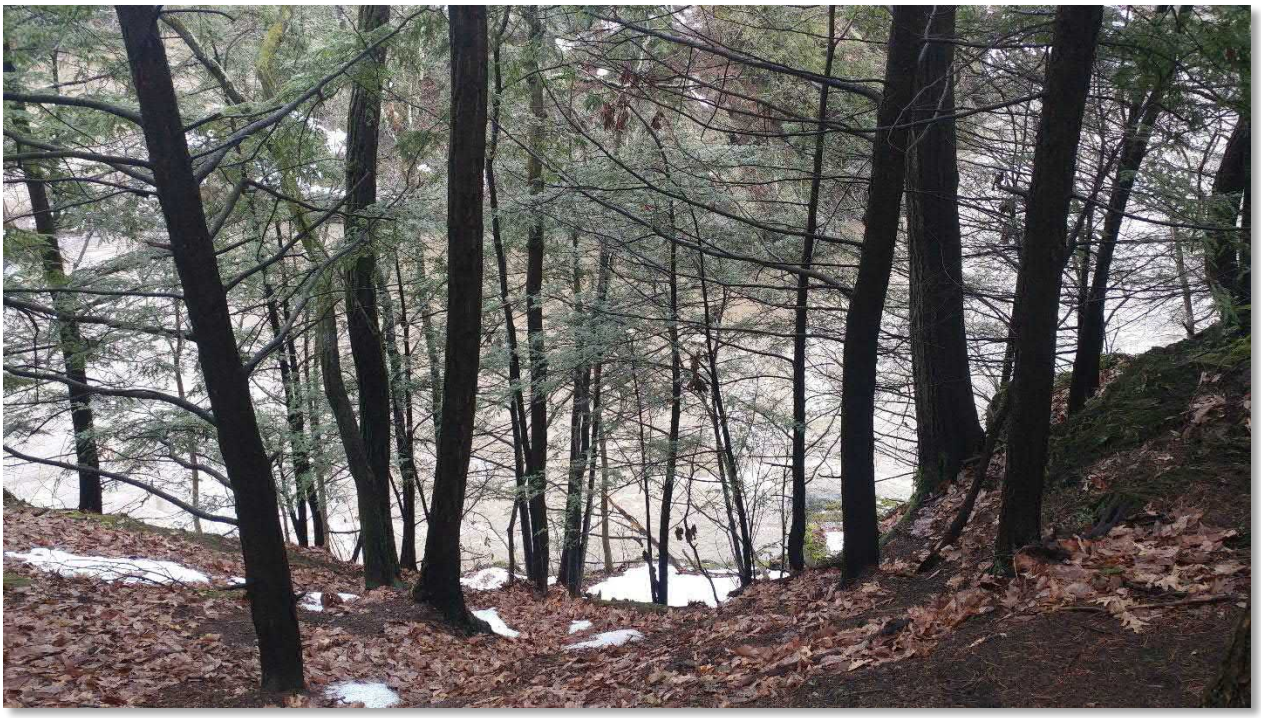


Figure 6 An area of the Pachaquack Preserve that was too steep for any project recommendations.

Having wetland and floodplain data provides information about environmentally sensitive and protected areas. This environmental data can also determine what type of development is allowed, prohibited, or should be encouraged or avoided. Sites such as Hudson Street Landing and Wilds Pond had environmentally sensitive areas where careful thought was given to the types of recommended projects.

Preliminary Assessment

General Observations

- Extensive linear access to creek shoreline.
- Many opportunities to access the creek by canoe or kayak.
- Scenic vistas that provide passive recreation opportunities.
- Shoreline in need of stabilization, parklands being lost, and access inhibited.
- Better interconnections needed between points of interest.
- Fishing opportunities are best in Valatie, boating opportunities are more prevalent in Kinderhook.

Public Participation

A critical part of the Recreational Resource Inventory was garnering the public's input. When working with the two Villages, it was important that the residents of both communities were actively involved in the process. This was accomplished by establishing a Steering Committee and facilitating two public workshops.

Members of the Committee were appointed by both Villages. The eleven Committee members had a variety of backgrounds and had special interest areas relating to the project. The purpose of the Committee was to provide leadership and guidance toward establishing four target sites as the focus of the inventory. With input from the public, the Consultants and the Committee would work together to generate concepts of the sites and determine what projects were of the highest priority.

The first Committee Meeting was on January 16, 2019. This meeting established the scope and schedule of the project. The meeting also identified multiple sites within the Villages that would potentially be the focus of the inventory. On February 7, 2019 the consultants and Mayors of Kinderhook and Valatie visited seven (7) of the sites discussed in the first meeting.

The second Committee Meeting was held on February 20, 2019. During this meeting, target areas that were part of the site visit were discussed and ultimately narrowed down to four sites. Preliminary concept plans for the four (4) target sites were generated based on discussions from the Committee Meetings and the site visits.

The preliminary concepts were key subjects for the two public workshops held for this project. The first public workshop was held on March 27, 2019 in the Village of Valatie and the second public workshop was held on April 11, 2019 in the Village of Kinderhook. The purpose of the two workshops were to get input from the public on the four (4) target sites. The public's input helped determine the highest priority projects to focus on within each site.

Figure 7 Public Workshop #2 on April 11, 2019

The first public workshop was attended by all members of the Committee and eighteen (18) members of the public. The workshop served as a brainstorming session where participants split into two (2) groups and brainstormed topics relating to the four (4) target sites. The topics included: 'Types of Recreation', 'Needs at Each Site', 'Linkages & Connections', and 'Other Recreational Opportunities'. With the information on the topics which related to each site, the consultants were able to create concept plans to present at the next public workshop.

The second public workshop was attended by six (6) Committee members and eleven (11) members of the public. For this workshop, participants split into two (2) groups and reviewed four (4) concept maps of the sites. Participants would indicate whether they liked the concepts at each site or whether they rejected them. The consultants also had questions to prompt discussion of each site. The questions determined what the target sites were missing, what areas of the sites should be preserved, where new projects could be incorporated within the site, and what projects should be prioritized. The information gathered from this public workshop was then presented to the Committee at their final meeting.

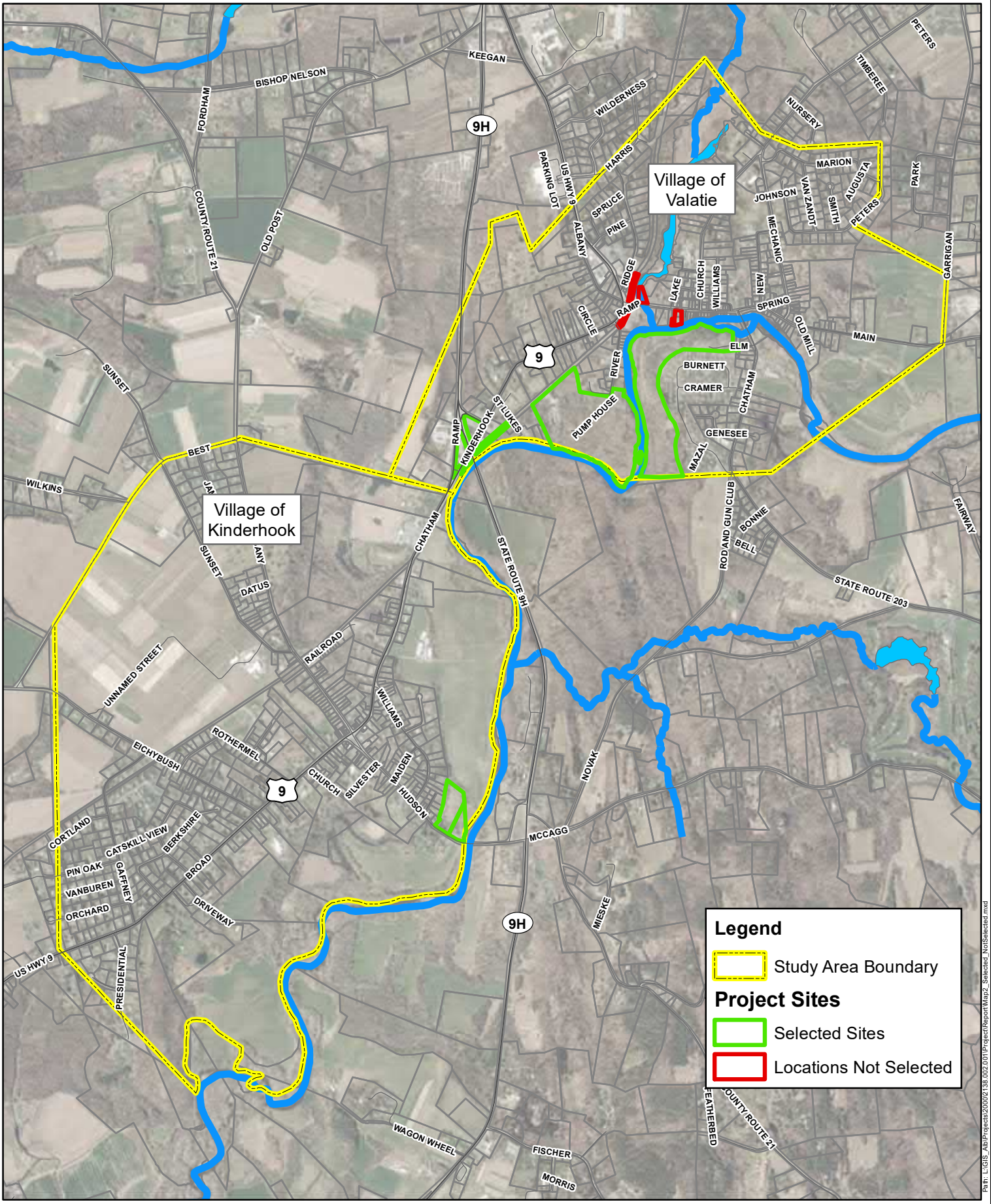
Figure 8 Participants at Public Workshop #2 on April 11, 2019

The last Committee Meeting was held on May 1, 2019, attended by nine (9) Committee members and one (1) member of the public. The Committee reviewed the outcomes of the two (2) public workshops and developed a prioritized list of specific projects for each site. This information was used to make the final report and final concept plans for the Recreational Resource Inventory.

As a result of the outreach, there was an increased interest in the projected from the public. Other groups including the Columbia Land Conservancy and NYS DOT were willing to assist in further discussions and coordination efforts.

Target Sites

At the beginning of the Recreational Resource Inventory, six sites along the Kinderhook Creek were the focus of the project. The six sites were River Street Park, Diamond Street, Pachaquack Preserve, Main Street Valatie - US-9 Intersection (Wilds Pond), Hudson Street Landing, and the Route 9H Overpass. By the second Committee Meeting, the sites were narrowed down. Two of the sites (Diamond Street, Main Street Valatie) were ruled out due to environmental concerns, cost considerations, and private property conflicts. Four sites were chosen as the focus of the project mostly due to their proximity to the Kinderhook Creek and the recreational opportunities they offered. *(See map 2 on the following page)*



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1 inch = 2,000 feet

Villages of Kinderhook and Valatie

Selected Sites & Locations Not Selected

Columbia County 2019 New York

Map 2

Project No. 2138.002

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Selected Target Sites

River Street Park was chosen as a target site due to its location along the creek, its existing public park and trails, and its frontage along the Albany Hudson Electric Trail (AHET). The Park resides alongside a large stretch of the creek in Valatie and provides many waterfront recreation opportunities such as kayaking, fishing, and swimming. The site comprises 39 acres of public property and includes 6,700 feet of footpaths and over a 3,100 feet of frontage along the creek. The opportunity of creating connections between the park and the AHET was a significant draw in choosing River Street Park.

Pachaquack Preserve was also chosen due to its prominence along the Kinderhook Creek and its existing public trails. The 41-acre preserve, roughly 31 acres of which is woodlands, has a well-developed trails network that was built with the help of the National Guard. The western part of the preserve has a gradual slope which is more accessible and has more opportunities for waterfront recreation. The preserve is already known for fishing due to the DEC stocking the creek from the preserve every year. The preserve is also a large piece of public property and there are opportunities to connect it to downtown Valatie and River Street Park via pedestrian bridges.

Hudson Street Landing was chosen as a target site due to its informal use by the public. It has been reported that the site attracts people who fish and tube at a nearby swimming hole. Formalizing the site as a park will improve its safety and its popularity. The property is mostly owned by the Village of Kinderhook when land was acquired during the bridge rehabilitation. An adjacent parcel is also available to purchase and the Village has considered acquiring/purchasing the land. The site is prone to flooding and a boardwalk was discussed as a solution to access more of the site. Also, its waterfront access provides multiple recreational opportunities.

The *Route 9H Overpass* was chosen as a target site due to its central location as the gateway to both of the Villages. It was also chosen due to its visibility from Route 9H, its location on the creek, and because it bisects the AHET. The proposed AHET improvements at the site create many opportunities to enhance this important gateway while offering opportunities to connect to the AHET users to the creek. The bridge piers are a unique art deco detailing and if rehabilitated would significantly enhance aesthetics. There are also opportunities to create a promenade through the site and improve the site's safety between the bridge and the nearby park-and-ride.

Locations Not Selected as Target Sites

A privately-owned vacant parcel on Diamond Street in the Village of Valatie was considered as one of the potential sites due to its location in the heart of the Village and that its low-lying areas offer access to the creek. The site was viewed as an area where waterfront recreation opportunities could be developed providing raft, boat, or tube access to the creek. There were considerations of adding a pedestrian bridge connecting the site to the Pachaquack Preserve. An amphitheater built into the slope of the site was also considered as a potential project.

Many questions arose during the inventory about whether there was a public right of way between the street and the Village pump station. Also, the steep slopes, rocky shoreline, and rough waters were a deterrent to creek access. Due to easement concerns, creek conditions, and cost considerations of a pedestrian bridge, the site was ruled out of the inventory.

Figure 10 Open space at Diamond Street where an amphitheater could be built into the slope

Figure 9 An amphitheater built into a slope at memorial Park Amphitheater, Cupertino CA

The Main Street Valatie - US-9 / Valatie Kill intersection is viewed as the western gateway of the Village of Valatie and a main link between the two Villages. There were other potential links to public open space around the Valatie Kill Dam, reported to be a Class C Dam. The area is privately-owned and would require ecological analysis for DEC approval before removing the dam. Although rehabilitating the dam would be beneficial, restoring it is unlikely. Due to the private property conflicts, the environmental constraints of the dam, and an eagle nesting at the site, the site was eliminated from consideration as a target site.

River Street Park

River Street Park is located in the southwest part of the Village of Valatie and on the western bank of the Kinderhook Creek. The park is approximately 39 acres and surrounds the wastewater treatment plant. The park has been categorized by the Land Conservancy as a flood plain forest. There is an existing parking lot off of River Street which is typically used for people accessing the park or the creek and a 0.5 acre lawn area.

The mostly wooded park has a system of shoreline and internal walking trails that provide a variety of nature observation opportunities. The park has 900 feet of frontage along the Albany Hudson Electric Trail (AHET) and nearly 3,000 feet of Kinderhook Creek shoreline. There is a small parking area for the park which has a 0.5 acre area with a gazebo and other amenities. The site hosts several local events including a fishing derby.

The priority projects for River Street Park are shoreline stabilization/repairs, establishing kayak launches, improving signage, improving trails accessibility, and establishing access to the AHET. Beach kayak launches at the northeast part of the park were decided as the most ideal place and the best type of kayak launch. The concept of the kayak launch at the southern part of the park is a lower priority.

Figure 11 River Street intersection with Kinderhook Street (Route 9). Signage indicating directions to River Street Park could be enhanced at this intersection.

Signage at the Kinderhook Street and River Street intersection indicating where the park is located is also a high priority. Wayfinding signage at existing access points displaying the nearby trails and their routes are a part of this priority. Improving connections into the park from the AHET is another potential project. This might require some upgrades to the existing trails and the creation of a bike loop. Incorporating wayfinding signage at proposed access points from the AHET is also suggested.

Improving trail accessibility from the parking lot is the third high priority for this site. Crushed stone is suggested between the parking lot and the trail in order to connect the two and in order to make the trail more accessible. Crushed stone would also improve drainage.

Medium priority projects include a feasibility study on the reuse of Gimp/Riley's Mill investigating the opportunities the property has to offer. Other medium priority projects are adding a fishing platform, upgrading and rehabilitating the pavilion, and establishing new pathways and dust paths. The last medium priority is performing a Natural Resource Inventory to quantify the shoreline length, remove invasive species, and incorporating native plants back into the park.

Other long term improvements include the addition of amenities near the parking area, establishment of a mountain bike trail, and construction of a wetland and boardwalk.

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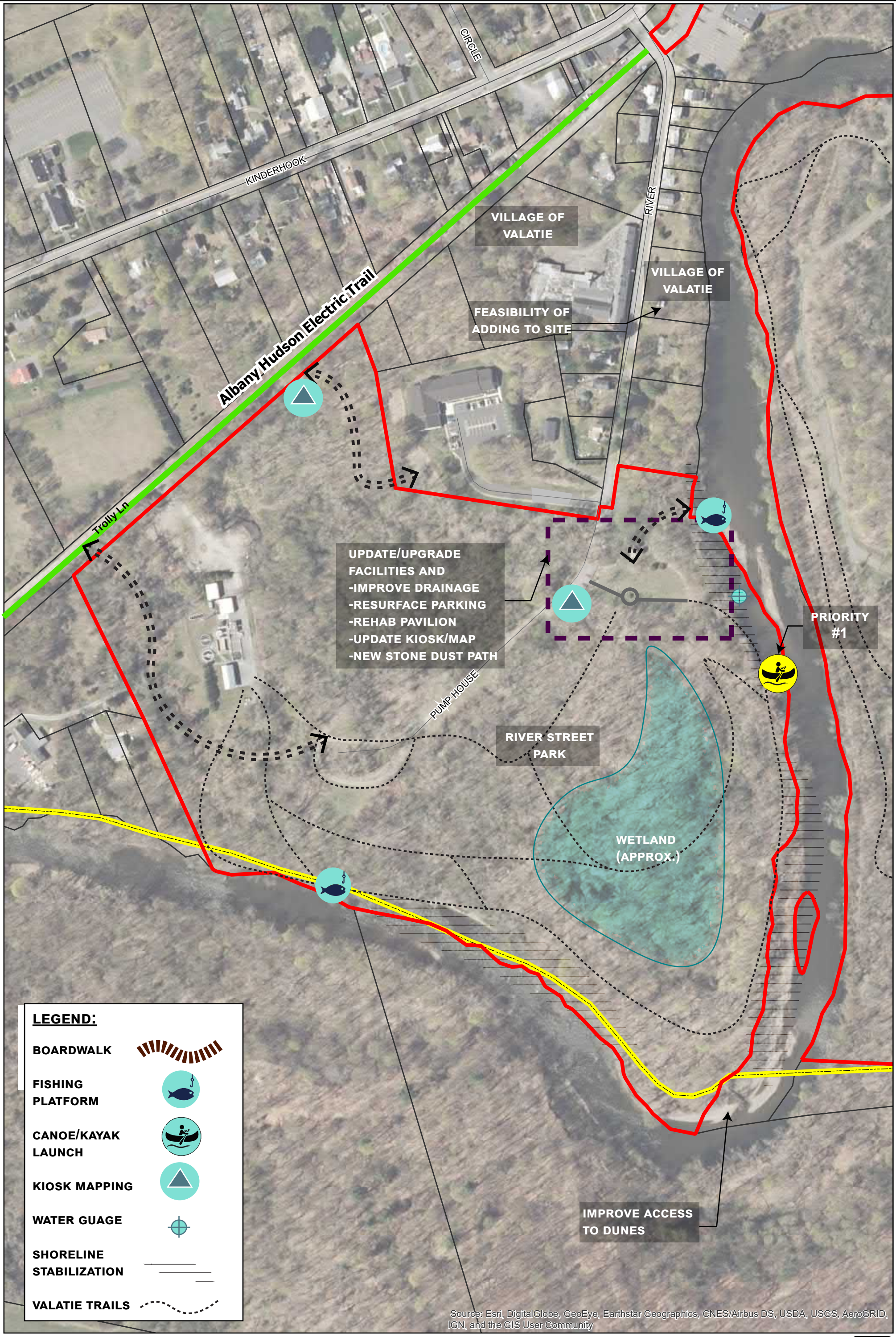

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1 inch = 200 feet

Villages of Kinderhook and Valatie

River Street Park

Columbia County 2019 New York

Map 3

Project No. 2138.001

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Pachaquack Preserve

Pachaquack Preserve is located in the southern part of the Village of Valatie on the Kinderhook Creek's east bank. The preserve is approximately 41 acres and has two Village well fields within its boundary. The creek adjacent to the preserve is annually stocked with trout by the DEC. There are existing trails along the shoreline which were previously maintained by the boy scouts. The preserve is generally heavily wooded with a pleasant nature tree canopy providing shelter and comfort. Trails access several scenic vistas of the creek and falls below, as well as observation points for wildlife. Access to the shoreline for boating is limited due to the distance and elevation change from parking to potential access points. Due to security needs for the water supply new vehicular access that could improve this connection is not anticipated. Another significant asset is the Knox Crossing historic site which could provide interpretive opportunities, as well as panoramic views of Main Street in Valatie and the creek.

Figure 12 Pachaquack Preserve during the February 7, 2019 site visit

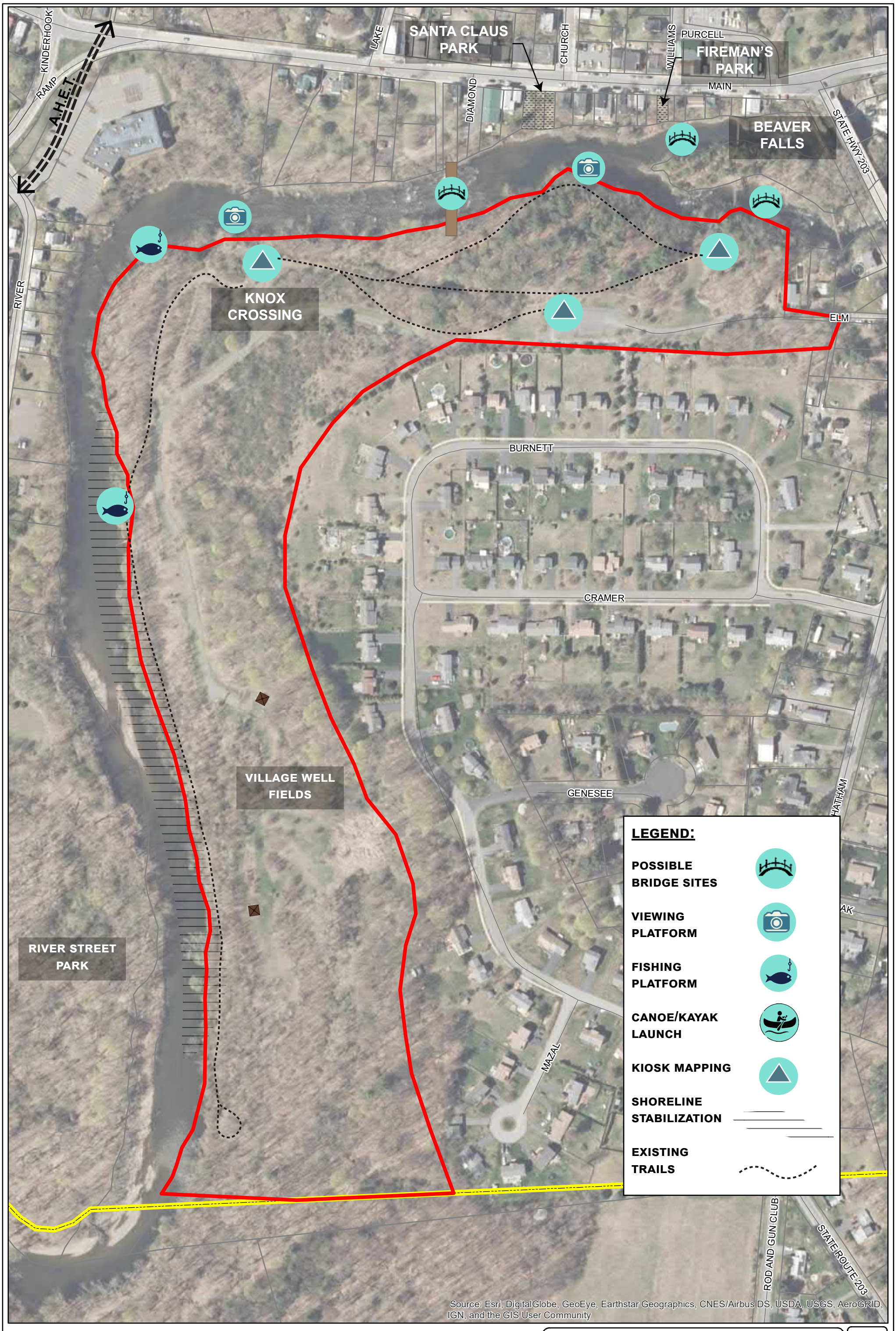
The highest priorities of the Pachaquack Preserve was to make connections to Main Street, include adding bridges over the creek, constructing fishing platforms, and adding more signage to the site to improve wayfinding. Pedestrian bridges to either Diamond Street or the Fireman's Park are the highest priority. These bridges would create a better connection from Pachaquack to Valatie's downtown. A bridge to River Street park was also desired and deemed a medium priority. A fishing/viewing platform at Santa's Park was also determined as a high priority. A fishing/viewing platform would create a scenic overlook of Beaver Falls and help establish the site's identity. Stabilizing the slopes would have to occur before either of these priorities were pursued.

Figure 13 Existing conditions at the Pachaquack Preserve and a proposed site of a fishing/viewing platform on the western part of the preserve

Figure 14 Fishing/viewing platform in Cohoes, NY

Having a consistent and comprehensive system of signage throughout the site is also a high priority. Signage included panels on the fish and wildlife in the area, as well as a panel about the DEC stocking the creek with fish. Interpretive signage near the Knox Crossing and along points of the trail on the indigenous people and the industrial history should be included as a way to emphasize the site's historical significance.

Figure 15 "Sky Bridge", a major tourist destination in Gatlinburg, KY



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N W E S

1 inch = 200 feet

Villages of Kinderhook and Valatie

Pachaquack Preserve

Columbia County 2019 New York

Map 4

Project No. 2138.001

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Hudson Street Landing

“Hudson Street Landing” is located on the eastern border in the Village of Kinderhook and on the west bank of the Kinderhook Creek. The site is approximately 1.9 acres of Village-owned land owned by the Village and is the site of a water pump station. A pie-slice-shaped parcel of land was recently purchased by DOT for the adjacent bridge project thus providing direct public access to the creek from the site. A gravel access drive allows for informal off-street parking. The site is covered by well-maintained lawn and a security fence around the pump station which limits access to about two-thirds of the site.

Figure 17 Grove of Sycamore trees at Hudson Street Landing

Figure 16 Boardwalk in New Castle, New York

Figure 18 A boardwalk at Black Swamp, Louisiana

The high priority at this site is adding a kayak launch and formalizing parking and access to the launch. A beach launch or shoreline apron could be built given the gradual slope to the shoreline near the bridge. This type of launch is very low impact and inexpensive. Examining and implementing various shoreline resiliency measures is also a high priority of the Hudson Street Landing as scour is starting to occur near the bridge abutments.

An adjacent residential parcel of 4.7 acres is currently for sale and there is an arrow head of unutilized riverfront to the east of the site. If that access could be gained the site's shoreline inventory would increase significantly.

Hudson Street is one of the suggested connecting paths for the AHET users looking to visit historic sites along Route 9H. Cyclist-related amenities should also be considered including bike racks and a repair kiosk.

Other potential priorities include adding a water level gauge and adding a kiosk/small pavilion to the site with mapping and information, and a large roof to provide some shelter. Coordinating with the DPW on reducing the size of the pump station fence to increase the publicly accessible area on the site is also recommended. This would open lawn areas for picnicking and small events. Finally, it was suggested that the site be re-branded as "Hudson Street Landing Park" providing a recreational identity.

Figure 20 Beach kayak launch example

Figure 19 Apron kayak launch example

POTENTIAL PURCHASE OF EASEMENT TO EXPAND PARK

REDUCE FENCE LINE

PICNIC TABLES

PAVILION

SHORELINE RESILIENCY IMPROVEMENTS

PRIORITY #1 KAYAK LAUNCH/FISHING PLATFORM

LEGEND:

- BOARDWALK
- PRIORITY #1 CANOE/KAYAK LAUNCH
- FISHING PLATFORM
- PROPERTY EXTENSION
- WATER GUAGE
- SHORELINE STABLIZATION

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N W E S

1 inch = 65 feet

Villages of Kinderhook and Valatie

Hudson Street Landing

Columbia County 2019 New York

Map 5

Project No. 2138.001

Route 9H Overpass

The final target site is at the Route 9H overpass crossing and interchange of Route 9. The Route 9H overpass is located within the Village of Valatie at the Valatie/Kinderhook border. The overpass is in a central location as the gateway to both Villages. It is in high visibility from Route 9H, located on the creek, and the Albany Hudson Electric Trail (AHET) crosses under 9H, then crosses Route 9 at the site creating a key node along the AHET. The proposed AHET improvements at the site creates additional opportunities to enhance this important gateway. The nearby park and ride lot is currently underutilized, but in combination with the Town maintained greenspaces it provides another opportunity to enhance the gateway while providing public and cyclist amenities.

Rehabilitation of the bridge is a high priority at the Route 9H Overpass. The concrete deck is deteriorating and delaminating at the joints with small chunks of concrete falling beneath the overpass. Bridge improvements include repaving the bridge and resurfacing the piers while retaining their unique 'art deco' design. Rehabilitation could include large welcome signs for each Village.

Figure 22 Existing conditions of the Route 9H Overpass, entering Valatie, NY

Figure 21 Gateway signage used on a bridge in Canastota, NY

Plan for the AHET to be routed through the site, include some signage and bike racks for the trail is a high priority. An expanded kiosk would include map panels of the surrounding trails and parks as well as information about the local businesses in the two Villages. Additional amenities including landscaping, creek access, a repair kiosk, and restrooms are consideration.

Access to the Kinderhook Creek at the site is limited by several factors. Public property is limited to the Route 9 and Route 9H rights-of-way and the AHET corridor which is owned by National Grid. Just north of the 9H right-of-way land between the AHET corridor and creek appears to be privately owned. Directly east of the bridge it appears a launch site could be established, however it is narrow and may encroach on private lands. South and west of the bridge the shoreline area narrows and it becomes infeasible due to slope height to access the creek. It may be possible to create parallel parking along the Route 9 frontage.

Passive recreational access at this site appears the best opportunity with potential to create a shoreline promenade creating fishing access and a creekside strolling path. The shelter provided by the 9H bridge creates an opportunity to create picnic space and a sheltered venue, linked to the trail and promenade.

The new formalized crossing created over Route 9 for the AHET will provide a safer crossing connection to the park and ride lot. With additional upgrades to the connection sidewalk and greenspace; that underutilized space could be repurposed as a park and major trailhead parking location.

Figure 24 Looking north at the Route 9H bridge. The AHET will pass under the bridge pier opening on the right side of this picture

Figure 23 Example promenade under bridge piers at the Onondaga Creekwalk in Syracuse, NY

EXAMPLE OF USES BENEATH BRIDGE OVERPASS

EXISTING BRIDGE PIER

PARK AND RIDE TRAILHEAD FOR AHET

IMPROVE PEDESTRIAN LINKAGE SAFETY

RAMP

KINDERHOOK

VALATIE

PEIR LIGHTING + REHAB

Albany Hudson Electric Trail (AHET)

PRIVATE PROPERTY

COORDINATE WITH NYSDOT ON PEDESTRIAN AND SCREENING TREATMENTS

UTILIZE SPACE UNDER BRIDGE FOR EVENTS SPACE. ADD PICNIC TABLES AND UP/DOWN LIGHTING TO HIGHLIGHT ART DECO DESIGN OF BRIDGE PIERS

PICNIC TABLES

BIKE RACKS

CONNECTING ROAD

CREEKSIDE BOARDWALK/RESILIENCY IMPROVEMENTS

STATE ROUTE 9H

Village of Valatie

Town of Kinderhook

LEGEND:

- PROPOSED TRAIL
- CANOE/KAYAK LAUNCH/LANDING
- VIEWING PLATFORM
- WATER GUAGE
- KIOSK MAPPING

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Barton & Loguidice

N W E S

1 inch = 100 feet

Villages of Kinderhook and Valatie

Route 9H Overpass

Columbia County 2019 New York

Map 6

Project No. 2138.002

Shoreline Recreation and Mitigation Measures

Recreation Needs

The creek is a focal point for recreation. It can be a sensory experience in viewing the moving waters, hearing the sounds of water and creekside nature, or feeling the effects in the air. It can be passively experienced from the shoreline on walking trails, fishing and wildlife observation. It can also be actively experienced by direct contact including boating, floating, and wading. Formalized areas and safe areas are needed to allow for enhanced sensory experience opportunities. This would leverage open spaces and underutilized spaces to create viewing opportunities, raised platforms, blinds and other measures that would provide currently unavailable views, and experiences along the creek.

Shoreline access enhancements are needed for other passive and recreational access opportunities including fishing, boating and direct access. Shoreline resiliency improvements are needed to provide safe and enhanced fishing access; and to provide launching and landing areas for canoes and kayaks. Additional shoreline amenities are also needed to provide comfort, shelter, directions and information for users.

The Albany-Hudson Electric Trail, part of the Empire State Trail system, passes in close proximity to the creek. Roadside spurs of the trail will cross the creek. Trail users will need information, direction and easy access points to exit the trail and enjoy a break along the Kinderhook Creek as well as information about local businesses. The best opportunities for this exist at River Street Park and at the Route 9H Bridge site.

Mapping and marking of landside and water-based trails need to be organized in a systems approach allowing for easy location for both modes of users. This would include a uniform system of navigational markers for land trails and water trails including mile markers, site identification and advanced notification signs. This will ensure a pleasant experience for blueway and greenway trail users, encouraging returns visits.

Resiliency Needs

Scour protection is needed to prevent further damage in two conditions, local scour and bend scour. Scour conditions exist near bridges and other built structures adjacent to creek waters. In general the design of the structures has incorporated scour protection; however, recent major flood events could compromise that protection. More widespread problems are a result of bend scour. This is a key factor along the Valatie shoreline, especially along the northern shoreline and southwestern shoreline of River Street Park; the southern shoreline of the Pachaquack Preserve; the segment

paralleling Route 9 at the Route 9H bridge; and throughout the Village of Kinderhook southern shoreline where the creek sharply meanders.

Mitigation Measures

Several mitigation measures should be employed to stop the current erosion problem and improve navigability, safety, water quality and fisheries. Toe protection, bank protection and overbank protections will be required. Toe protection will involve placement of stone, preferably local natural stone at the water surface interface. Bank protection can be a variety of hard, soft and vegetative measures depending on desired recreational use, soil conditions, the local velocity, angle of bend in the stream bank and slope of the bank. We recommend that where suitable, 'lunkers' be installed which are built timber or rock underwater 'caves' providing salmonid shelter.

For Kinderhook Creek we strongly recommend soft shoreline resiliency approaches be employed. While toe protection will required the use of stone, rip-rap or other solid structural measures; bank protection should be primarily soft approaches and vegetative. Among the most suitable measures are:

- Stream Vanes and Bendway Weirs – rock and timber weirs designed to redirect erosive forces (cost $500-$750/LF)
- Wrapped Soil Lifts with Live Stakes – planted fabric wrapped soil walls (cost $200-$350/LF)
- Live Crib Wall – live timber cribbing with live fascines added as needed (cost $350-$600/LF)
- Rip-Rap with Joint Plantings – stone reinforced with live stakes or live vertical bundles (cost $220-$400/LF)
- Soil Choked Rip Rap – shallow sloped rip-rap topped with soil and plantings (cost $100-$200/LF)
- Live Fascines – bundled live twigs staked to native soil (cost $70-$120/LF)
- Root Wads – root structure from large trees to redirect erosive forces (cost $300-$500/LF)
- Fiber Logs and Compost Socks – fiber or compost filled logs planted with vegetation (cost $180-$270/LF)

Cost information adapted for 2021 dollars from "A Cost Comparative Analysis of Ton Shoreline Protection Approaches," (Rella, Miller) 2014. Additional study and engineering will be required to carefully design to a suitable factor of safety and based on the latest climate projections. See the appendices for additional information on the recommended mitigation measures.

Prioritized Actions List & Funding Sources Summary

The following list is organized by the four (4) target sites within the Villages of Kinderhook and Valatie. The list further breaks down prioritized actions at each site with potential funding sources. A key is found at the end of this section.

General Actions		Priority	Funding
GA.1	Blueway Trail Map, Mileage Markers, Signage System	**H**	**EG**
GA.2	Shoreline Resiliency Action Plan and Implementation	**H**	**EG, DOS-L**
GA.3	Fishery Enhancements	**H**	**EG**
GA.4	EST Trailside Maps of Kinderhook Creek Recreation Opportunities	**M**	**EG, DOS-L, MARKET NY, HRVG**
River Street Park			
RS.1	Kayak Launches	**H**	**EG, DOS-L, HRVG**
RS.2	Improving Signage	**H**	**EG, TAP, HRVG**
RS.3	Improve Trail Accessibility	**H**	**HRVG, RTP, DOS-L**
RS.4	Feasibility Study on Gimp/Riley's Mill	**M**	**PRKS; DOS-L, DOS-B**
RS.5	Natural Resource Inventory	**M**	**EG**
RS.6	Upgrading/Rehabilitating the Pavilion	**M**	**PRKS, DOS-L**
RS.7	Fishing Platform	**M**	**PRKS, DOS-L, EG**
Pachaquack Preserve			
PP.1	Pedestrian Bridges	**H**	**TAP, CSC**
PP.2	Fishing/Viewing Platform	**H**	
PP.3	Improving Signage	**H**	

Prioritized Actions List & Funding Sources Summary

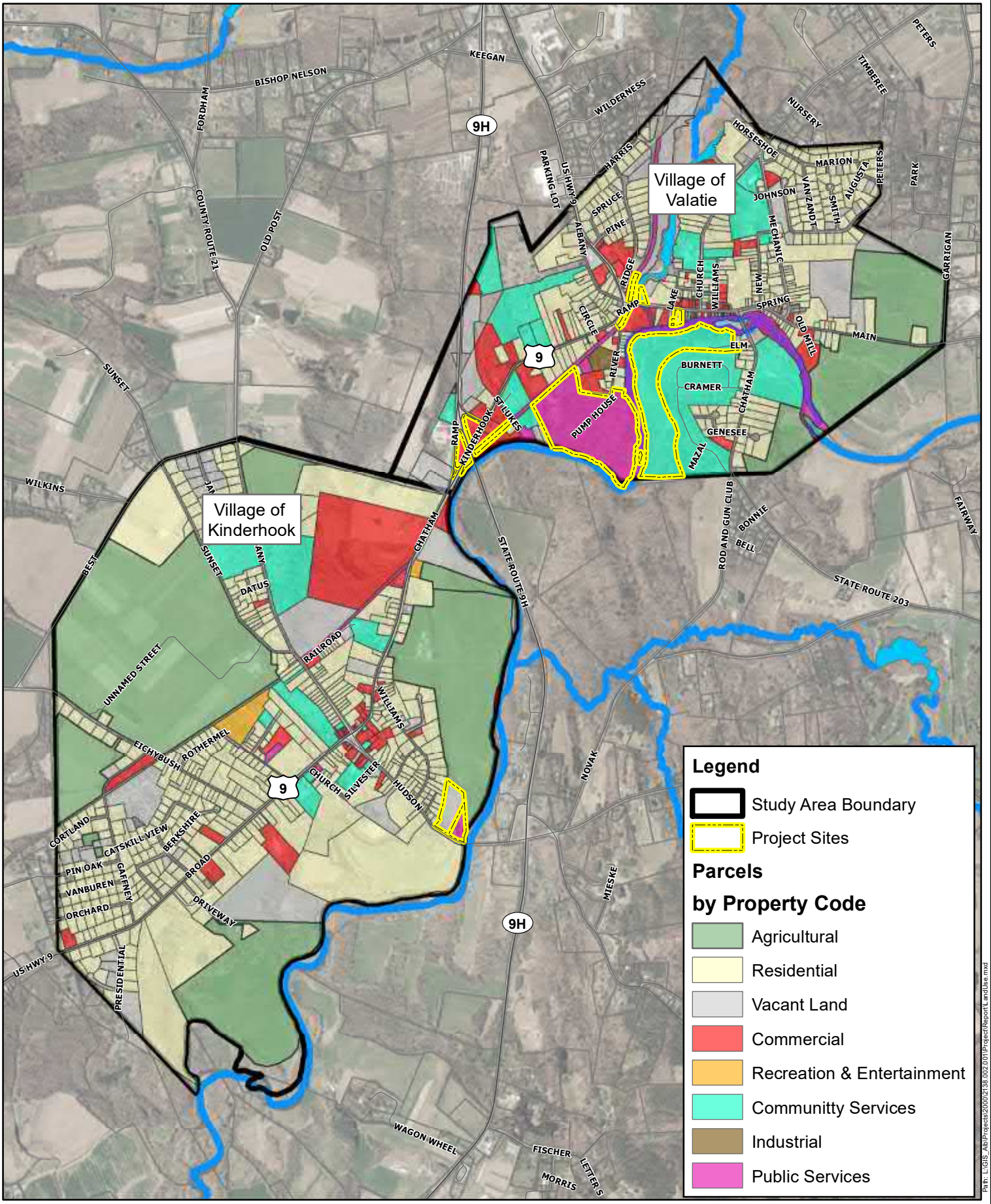
Hudson Street Landing		Priority	Funding
HA.1	Adding a Boardwalk	**H**	**Buy-a-Boardwalk**
HA.2	Kayak Launch	**H**	**PRKS, DOS-L, EG**
HA.3	Shoreline Resiliency	**H**	**DOS-L**
HA.4	Water Level Gauge	**M**	
HA.5	New Kiosk/Pavilion	**M**	**PRKS, DOS-L**
HA.6	Reducing Pump Station Fence	**M**	
Route 9H Bridge Gateway			
BG.1	Bridge Rehabilitation	**H**	**TIP**
BG.2	Trail Amenities (Trails, bike racks, benches)	**H**	**PRKS, DOS-L, HRVG, RTP**
BG.3	Improved Signage (Wayfinding and Interpretive)	**H**	
BG.4	Improved Safety	**M**	**PRKS, DOS-L, EG**
BF.5	Kayak Launch	**L**	

Prioritized Actions List & Funding Sources Summary

Grant Funding Program Key	
EG	NYS DEC Estuary Grant Program
DOS-L	NY Department of State Local Waterfront Revitalization Program
DOS-B	NY Department of State Brownfield Opportunity Areas Program
PRKS	NY Office of Parks, Recreation and Historic Preservation EPF Grants
RTP	Recreational Trail Program
TAP	Transportation Alternative Program
TIP	Transportation Improvements Plan
HRVG	Hudson River Valley Greenway Grant
Priority Key	
H	High Priority
M	Medium Priority
L	Low Priority

Appendices

Appendix A - Associated Maps



Barton & Loguidice

N
W E
S

1 inch equals 2,000 feet

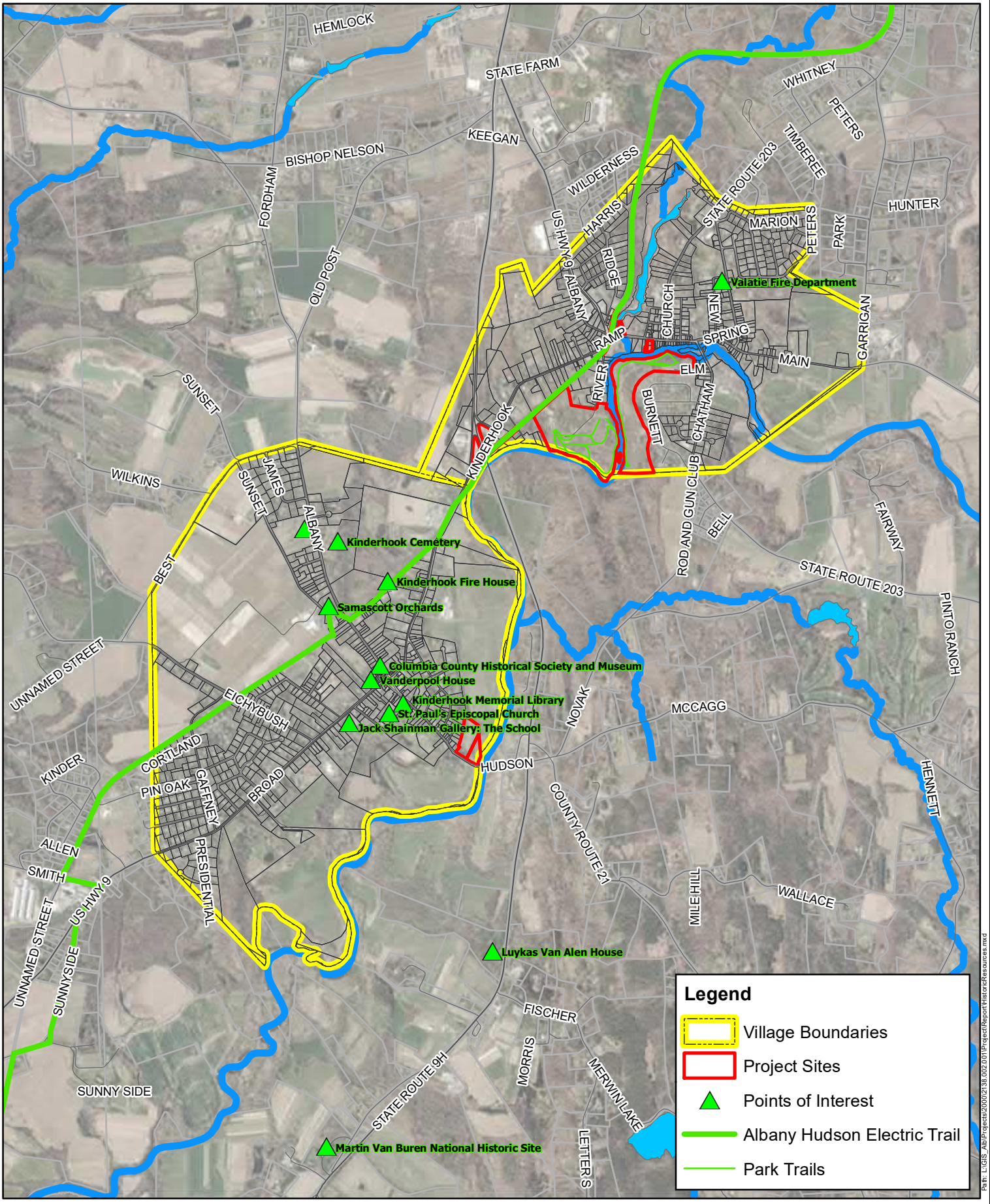
Villages of Kinderhook and Valatie

Land Use Map

Columbia County 2019 New York

Map 7

Project No. 2138.002



Barton & Loguidice

N
W E
S

1 inch = 2,500 feet

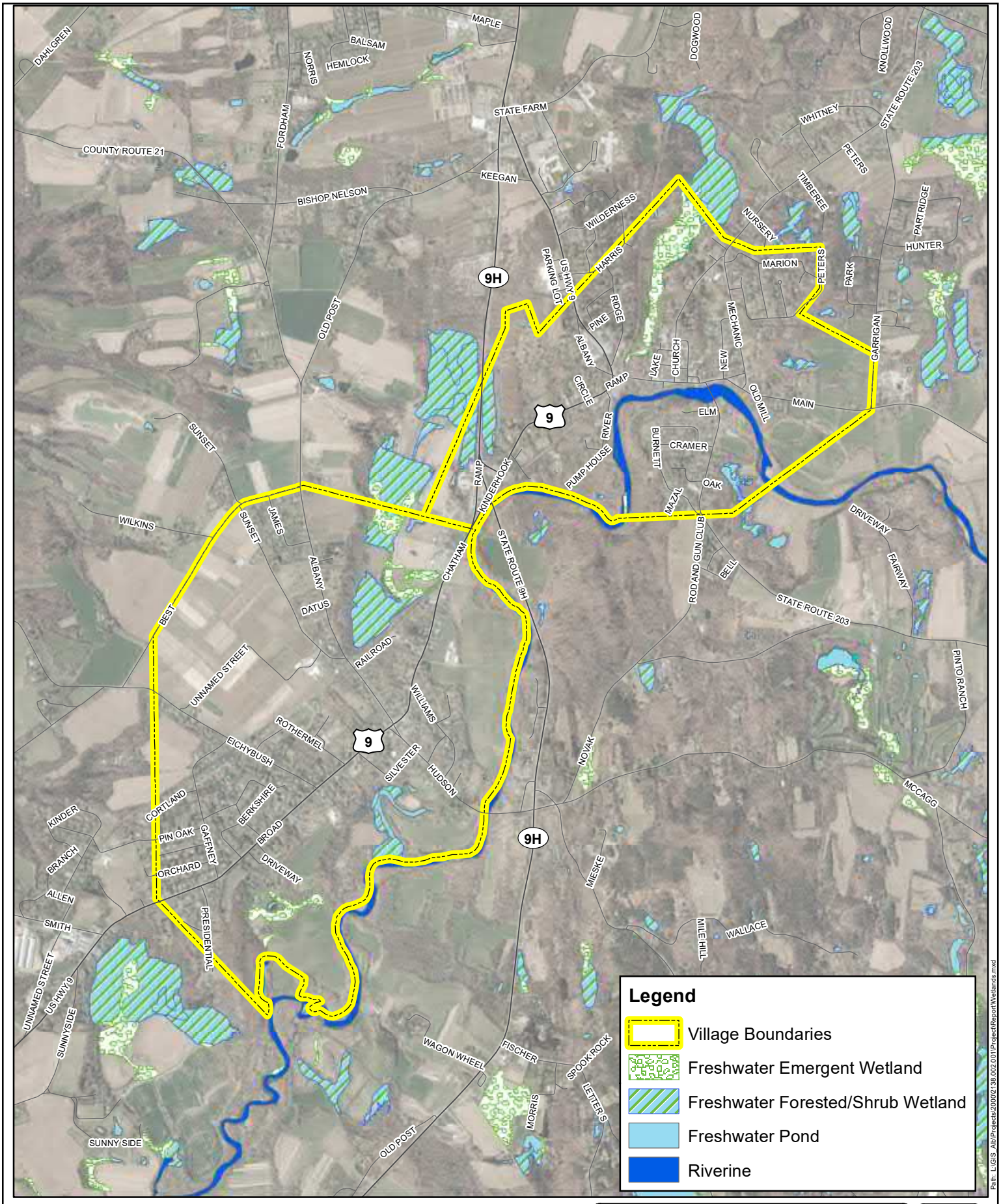
Villages of Kinderhook & Valatie

Historic Sites, Points of Interest, and Trails

Columbia County 2019 New York

Map 8

Project No. 2138.002



Legend

- Village Boundaries
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Riverine

Path: L:\GIS_Ab\Projects\2000\2138.002.001\Project\Report\Wetlands.mxd

Barton & Loguidice

1 inch = 2,500 feet

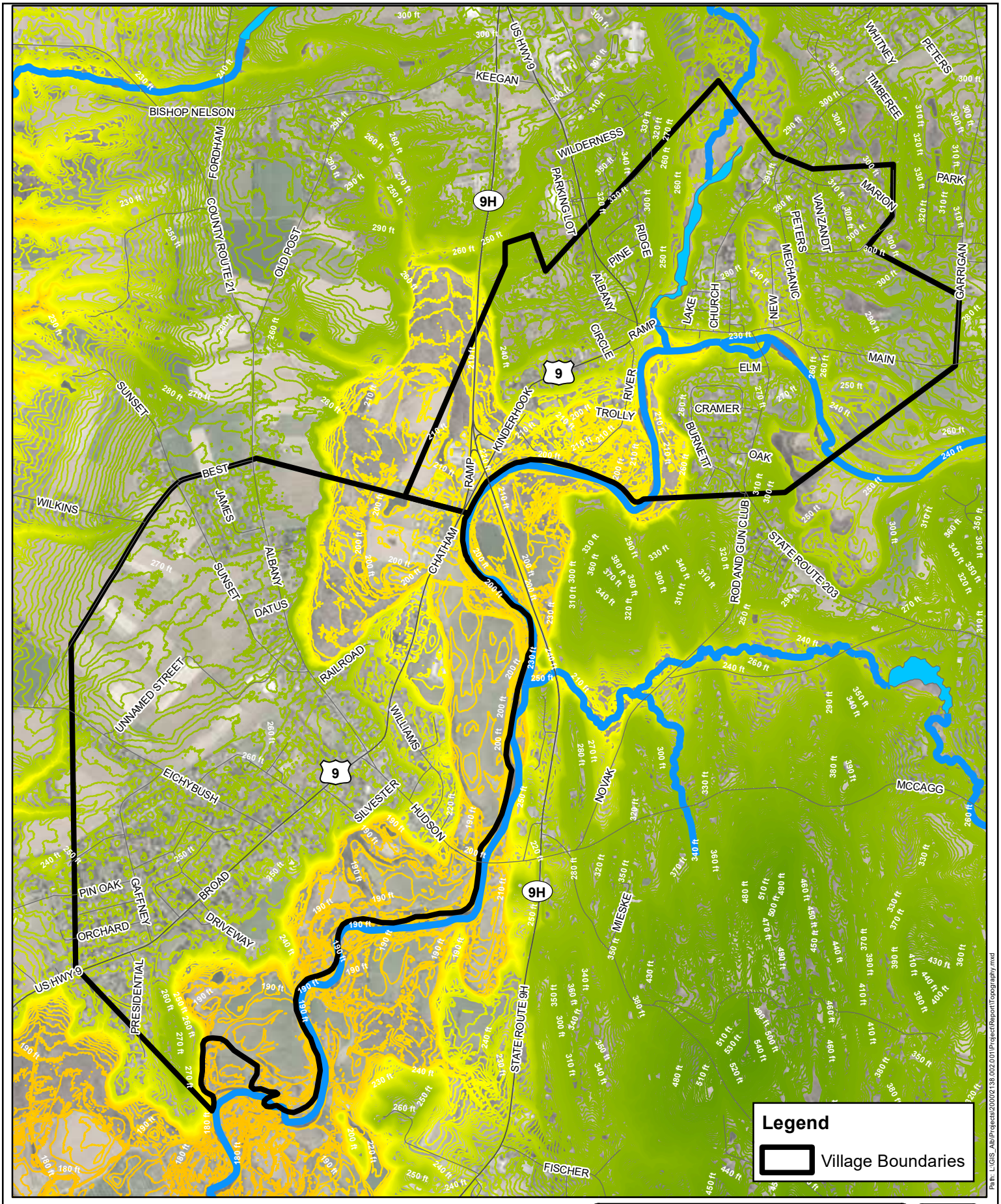
Villages of Kinderhook & Valatie

Wetlands

Columbia County 2019 New York

Map 9

Project No. 2138.002


KEEGAN
BISHOP NELSON
FORDHAM
COUNTY ROUTE 21
OLD POST
US HWY 9
WILDERNESS
PARKING LOT
9H
PINE RIDGE
ALBANY CIRCLE
RAMP
LAKE CHURCH
NEW MECHANIC
PETERS
VAN ZANDT
MARION
PARK
GARRIGAN
WHITNEY
TIMBEREE
PETERS
MAIN
ELM
CRAMER
OAK
BURNETT
ROD AND GUN CLUB
STATE ROUTE 203
9
KINDERHOOK
TROLLY
RIVER
RAMP
SUNSET
BEST
WILKINS
JAMES
ALBANY
SUNSET
DATUS
CHATHAM
RAILROAD
UNNAMED STREET
WILLIAMS
EICHYBUSH
SILVESTER
HUDSON
NOVAK
MCCAGG
MESKE
PIN OAK
GAFFNEY
BROAD
DRIVEWAY
ORCHARD
US HWY 9
PRESIDENTIAL
STATE ROUTE 9H
FISCHER
Legend
Village Boundaries
1 inch = 2,000 feet
Villages of Kinderhook & Valatie
Topography
Columbia County 2019 New York
Map 10
Project No. 2138.002
Barton & Loguidice

Appendix B - Resiliency Measures

Rootwad Revetments

Approach

Soft Hard

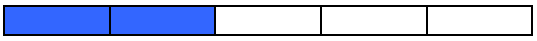
Construction Cost

Low High

Maintenance Cost

Low High

Adaptability



Low High

Description

Rootwad revetments are a type of revetment fashioned out of the lower trunk and root fan of a felled tree. Rootwad revetment projects frequently incorporate other natural materials such as boulders and logs to enhance the amount of stream bank stabilization they provide. In addition to providing stabilization, rootwad revetments also provide an improved fish rearing and spawning habitat, when compared to traditional revetments. Typically, rootwad revetments are installed in a series along streams with meandering bends.

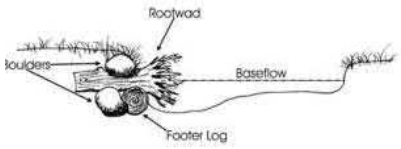


Figure 9: Rootwad revetment cross-section (Stormwater Management Resource Center).

Design and Construction

Unlike traditional revetments for which there are well-documented systematic design approaches, rootwad revetment layout and construction involves significantly more uncertainty. Like traditional revetments, overtopping is one of the primary causes of failure; therefore accurately determining the water level is essential. If the crest of the structure is sited too close to the water line overtopping will occur and the top of the structure will be exposed to scour, potentially compromising its structural integrity. Rootwad revetments also tend to be vulnerable to erosion at the toe (base) and flank (ends), therefore supplemental reinforcement is frequently added in these regions. Because of the increased vulnerability to toe erosion, rootwad revetments tend not to be effective in streams where the bed has been severely eroded and where undercutting of the structure is likely. Rootwad revetments also typically do not perform well on streams winding through rocky terrain or on narrow streams bounded by high banks.

Live Crib Wall

Approach

Construction Cost

Maintenance Cost

Adaptability

Description

As discussed above, a crib wall is a 3 dimensional boxlike chamber typically constructed of untreated log or timber that is filled with alternating layers of rock, gravel, soil or other fill material. Live crib walls are typically constructed at the base flow level where they can be very effective in preventing bank erosion and retaining soil. Live crib walls integrate live branches into the traditional crib wall design which eventually take root inside the box and extend into the slope of the bank. The vegetation, once established, helps stabilize the structure while also creating habitat along the shoreline. The root system of the vegetation binds the structure into a single large mass.

Like crib walls, live crib walls are typically used in situations where the toe of a slope needs to be stabilized and where a low wall may be needed to reduce the steepness of a bank. They are normally used in small rivers or streams; however by adding anchors for additional support, they can be adapted for use in more extreme conditions.

Design and Construction

The materials used in the construction of a crib wall are typically readily available. The frame of the structure is usually constructed of untreated timber or logs with diameters ranging from 4" to 8" (eastern white cedar, red pine, jack pine or spruce are common). Small stones with diameters of between 1 and 4 inches are commonly used as a base layer, with locally sourced clean fill or soil used to fill each compartment. The vegetation incorporated into live crib walls are commonly branches 0.5 to 2 inches in diameter with willow, dogwood, and other woody species being typical.

Live crib walls are able to withstand reasonably high velocities and shear stresses. Construction proceeds as above for crib walls, however in a live crib wall, layers of branch cuttings and soil are interspersed between each layer of timber above the base flow level.

Vegetated Geogrids

Approach

Soft Hard

Construction Cost

Low High

Maintenance Cost

Low High

Adaptability

Low High

Description

A vegetated geogrid is a soil wall that is placed on a bank or shore that has been severely eroded. The wall is made up of successive soil lifts that are separated by and wrapped in a synthetic control fabric. Branch cuttings are then placed between each layer. The live branch cuttings serve several practical purposes. The cuttings act as a buffer to reduce wave energy and shear stress at the face of the wall. In addition, having the branch cuttings present before the completion of the wall enables the vegetation to grow as rapidly as possible. Finally, once established the branches serve to bind the geogrids together and provide a root structure behind the wall, attaching it more securely to the shore

Design and Construction

Vegetated geogrids are mainly used on smaller rivers or streams, and are designed to withstand maximum current velocities of 14 ft/s, and shear stresses of up to 8 lb/ft^2. The streambed needs to be stable at the construction location and all construction needs to be performed during times of low water.

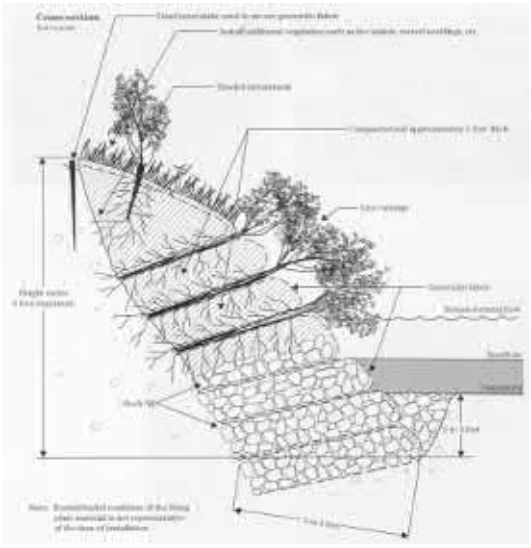
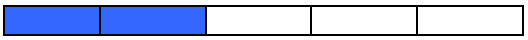


Figure 26: Typical vegetated geogrid (Iowa DNR, 2006).

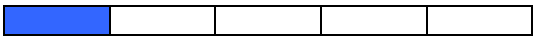
Construction materials consist of branches (typically 0.5” to 2.5” in diameter - willow, dogwood, or other native woody plants), rock fill (with diameters ranging from 4” to 9”), soil and an erosion control fabric (synthetic polymer). Construction typically proceeds in a step-by-step fashion with each successive layer being built upon the

Live Stakes / Joint Planting

Approach



Construction Cost



Maintenance Cost

Adaptability

Description

Joint planting consists of adding live stakes or vegetation into the open spaces, or joints, of an existing rip-rap or rock covered slope. Alternatively, the stakes can also be placed at the same time as the rock reinforcement. When the system of roots from the live stakes develops it creates a living root mat beneath the rocks, binding the soil and preventing washout of the soil and fine material, while also providing habitat.

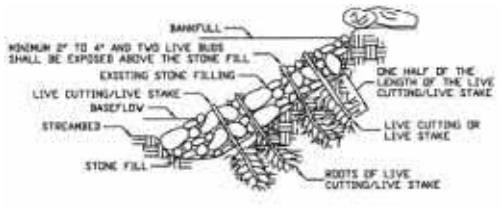


Figure 27: Typical joint planting (NYS DEC, 2005).

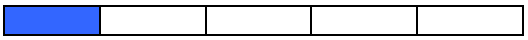
Design and Construction

Joint plantings are typically constructed in areas where a sloping rip-rap or rock revetment either exists or is planned. Live stakes/joint plantings have been shown to have a limited capacity to withstand wave action. This method has been shown to be most effective on rivers and streams with minimal flow fluctuations. Ideal sites should have a moderate slope and sufficient light for the vegetation to grow. Permissible shear stresses of 2.1 to 3.1 lb/ft^2 and flow velocities of 3 to 10 ft/sec are given for live willow stakes in Fischenrich (2001). The individual stakes typically consist of 2" to 3" diameter live stakes (willow or other woody plants).

Live stakes/joint planting is typically built on an existing or planned rock slope. The rocks should be appropriately sized to ensure their stability. The live stakes are placed perpendicular to the slope and tamped 2/3 of their length into the ground. A steel rod or hydraulic probe may be required to prepare the hole for the planting. The live stakes should be left with their tips slightly protruding from the surface of the rocks and placed in a random configuration. After construction, the live stakes need to be monitored regularly to ensure they take root and leaf-out. Beyond that there is typically little maintenance involved.

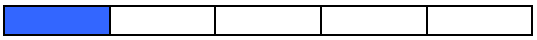
Live Fascines

Approach



Soft Hard

Construction Cost



Low High

Maintenance Cost

Low High

Adaptability

Low High

Description

Live fascines are composed of long bundles of branch cuttings that have been bound together. Once bound, they are placed, lengthwise, in shallow cylindrical trenches in rows along the bank. The live fascines are further supported by live and dead stakes. Adding live fascines to a stream bank can reduce erosion and sliding of the slope.

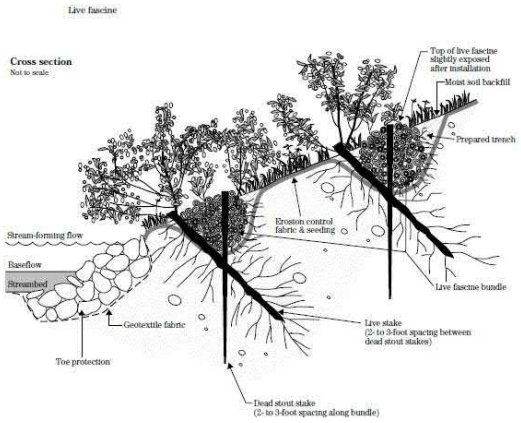


Figure 33: Typical live fascine cross-section (USDA, 1996).

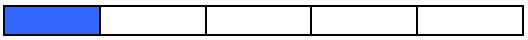
The cuttings take root and sprout, so they must be placed on a bank which will keep the bundle wet throughout the growing season, but not exceed the plant's flood tolerance. Small to moderate perennial streams with a consistent water level are best suited for this type of stream bank stabilization project. Conditions at the site must be such that the roots can penetrate the earth, and reach the water table. As with most of the techniques involving live plants, the amount of exposure to sunlight and the type of soil at the site are also important.

Figure 34: Live fascine slope stabilization (Photo courtesy USDA - Robbin B. Sotir & Associates).

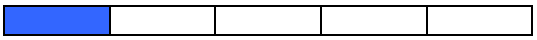
In the design of a live fascine project, the most important factor is the consideration

Coconut Fiber Rolls

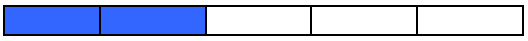
Approach



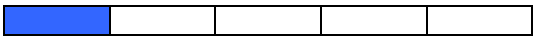
Construction Cost



Maintenance Cost



Adaptability



Description

Coconut fiber (or coir) rolls are long, cylindrical structures, constructed from the fibers of a coconut. They are most commonly constructed with diameters on the order of 12 inches and lengths of between 18 and 24 inches. The rolls are typically held in place at the toe of a slope using stakes. Coconut fiber rolls are used to both prevent minor sloughing on the shore, and to impede shoreline erosion.

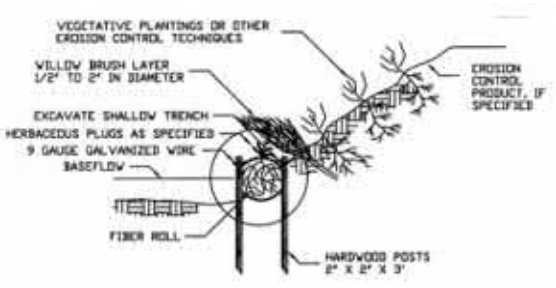


Figure 35: Typical coconut fiber roll installation (NYS DEC, 2005).

Design and Construction

Coconut fiber rolls are manufactured off-site and must be ordered prior to the commencement of site preparation. The rolls are normally placed at the toe of the slope at the stream-forming flow stage. Shear stresses related to the dominant flow and wave energy are the 2 dominant destabilizing forces which must be considered.

The first step in the construction process is the digging of a trench at the toe of the slope. The coconut fiber roll is then placed in the trench, with stakes utilized to stabilize it. Back fill is added upslope from the roll and vegetation is planted to provide additional protection. In some cases, vegetation is planted in to the roll itself.

Construction and material costs for the installation of coconut fiber logs has been estimated at $68/lf, on average, of which the cost for materials is approximately $11/lf (NSP, 2006).

Adaptability

The standard lifespan of a coconut fiber roll is 6 to ten years. The roll is flexible and can be formed to fit the curvature of the stream bank before placement. Once plants start growing within the fiber roll, the structure

Stream Barbs

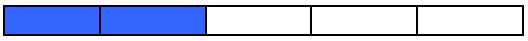
Approach

Soft Hard

Construction Cost

Low High

Maintenance Cost



Low High

Adaptability

Low High

Description

Stream barbs are similar to groins and function in much the same way; however they tend to be lower in relief and less obtrusive. Stream barbs are constructed as low rock sills that project out from a stream bank and serve to redirect flow away from an eroding shoreline. Similar to groins, they are normally placed in groups of 3 or more and run parallel to each other.

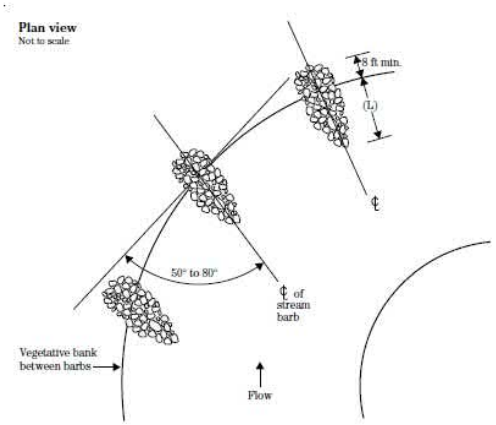


Figure 42: Plan view of a stream barb installation (USDA, 1996).

Design and Construction

Some of the important factors that need to be taken into consideration when designing a stream barb field are: the length, width, and height of the individual barbs, the spacing between the barbs, and the angle between the barbs and the upstream bank.

Figure 43: Field installation of stream barbs (USDA, 1996).

Stream barb construction typically begins at the shoreline and continues stream-ward. Typical stream barb dimensions are 2 feet high and not less than 8 to 10 feet wide (USDA, 2000). When installed in series, spacing between the barbs generally ranges from 4 to 5 times the length of the individual barbs. Common angles of