HUDSON RIVER HABITAT RESTORATION

ECOSYSTEM RESTORATION
DRAFT INTEGRATED FEASIBILITY REPORT AND ENVIRONMENTAL ASSESSMENT

APPENDIX G5: CULTURAL RESOURCES

U.S. Army Corps of Engineers
New York District

June 2019

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, NEW YORK DISTRICT
JACOB K. JAVITS FEDERAL BUILDING
26 FEDERAL PLAZA
NEW YORK NEW YORK 10278-0090

March 25, 2019

Environmental Analysis Branch

Daniel Mackay
Deputy Commissioner
Office of Parks, Recreation and Historic Preservation
New York State Division for Historic Preservation
Peebles Island State Park
P.O. Box 189
Waterford, NY 12188-0189

Dear Mr. Mackay:

The U.S. Army Corps of Engineers, New York District (District), in partnership with the New York State Department of Environmental Conservation (NYSDEC), has been preparing the draft Hudson River Habitat Restoration (HRHR) Feasibility Study and Environmental Assessment. A report, entitled *Preliminary Historical and Archaeological Assessment for the Hudson River Habitat Restoration Project, Hudson River Basin, New York,* was prepared to identify potential impacts to cultural resources in accordance with NEPA and the National Historic Preservation Act and is enclosed (Enclosure 1). The survey consisted of a review of existing data pertaining to historic and archaeological resources for six restoration sites and an assessment of the potential for adverse effects to cultural resources associated with the recommended restoration measures, or Tentatively Selected Plan (TSP).

The District is recommending restoration measures at five of the six sites that were evaluated in the feasibility study. At this time the District has identified the Area of Potential Effect (APE) for each site and identified any previously documented historic properties that may be impacted by the proposed restoration measures as well as areas that are considered archaeologically sensitive or requiring further investigations. The District has determined that additional investigations will be required at these sites as detailed designs are developed and the APE is better defined to complete a determination of adverse effects to historic properties. To that end the District has elected to develop a Programmatic Agreement (PA) to outline the steps required to carry out the District's remaining Section 106 responsibilities including conducting additional surveys, consulting with interested parties, determining adverse effects, and, if necessary, mitigating for adverse effects (Enclosure 2).

The District invites the New York State Office of Parks, Recreation, and Historic Preservation (NYSOPRHP) to review the report and the draft Programmatic Agreement and provide comments. The PA is to be entered into by the District and the NYSOPRHP. The Advisory Council on Historic Preservation are also being invited to participate in this Agreement. In addition, several federally recognized Native American Tribes with significant cultural heritage in the region have been invited to participate as interested parties. The invited tribes are the St. Regis Mohawk, the Delaware Nation, the Delaware Tribe of Indians and the Stockbridge-Munsee Community. If the NYSOPRHP wishes to add any other groups to the list of interested parties who should participate in this process please include that information with your

comments.

Please review the enclosed report and draft PA and provide Section 106 comments pursuant to 36 CFR 800.5. If you feel it would be beneficial to schedule a meeting amongst the signatories and interested parties, please include that with your comments. The District looks forward to working with you on the HRHR Project. If you or your staff require additional information or have any questions, please contact Carissa Scarpa, Project Archaeologist, at (917) 790-8612 or Carissa.a.scarpa@usace.army.mil.

Sincerely,

Peter M. Weppler
Chief, Environmental Analysis Branch

Enclosures

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, NEW YORK DISTRICT
JACOB K. JAVITS FEDERAL BUILDING
26 FEDERAL PLAZA
NEW YORK NY 10278-0090

March 25, 2019

Environmental Analysis Branch

Ms. Susan Bachor
Delaware Tribe of Indians
Historic Preservation Representative
P.O. Box 64
Pocono Lake, PA 18347

Dear Ms. Bachor:

The U.S. Army Corps of Engineers, New York District (District), in partnership with the New York State Department of Environmental Conservation (NYSDEC), has been preparing the draft Hudson River Habitat Restoration (HRHR) Feasibility Study and Environmental Assessment. A report, entitled *Preliminary Historical and Archaeological Assessment for the Hudson River Habitat Restoration Project, Hudson River Basin, New York,* was prepared to identify potential impacts to cultural resources in accordance with NEPA and the National Historic Preservation Act and is enclosed (Enclosure 1). The survey consisted of a review of existing data pertaining to historic and archaeological resources for six restoration sites and an assessment of the potential for adverse effects to cultural resources associated with the recommended restoration measures, or Tentatively Selected Plan (TSP).

The District is recommending restoration measures at five of the six sites that were evaluated in the feasibility study. At this time the District has identified the Area of Potential Effect (APE) for each site and identified any previously documented historic properties that may be impacted by the proposed restoration measures as well as areas that are considered archaeologically sensitive or requiring further investigations. The District has determined that additional investigations will be required at these sites as detailed designs are developed and the APE is better defined to complete a determination of adverse effects to historic properties. To that end the District has elected to develop a Programmatic Agreement (PA) to outline the steps required to carry out the remaining Section 106 responsibilities including conducting additional surveys, consulting with interested parties, determining adverse effects, and, if necessary, mitigating for adverse effects (Enclosure 2).

As a tribe with significant cultural heritage in the region, the District would like to take this opportunity to invite you to review and comment upon the survey report and draft PA for the HRHR Project. The PA is also being coordinated with the SHPO, Advisory Council on Historic Preservation, Delaware Nation, the St. Regis Mohawk, and the Stockbridge-Munsee Community. The draft PA will be available for public review in the project's draft Integrated Feasibility Report and Environmental Assessment, prepared under the National Environmental Policy Act, which will serve as part of the Corps' Section 106 public coordination.

The District invites the Delaware Tribe of Indians to participate in the PA and the project as a consulting party. Please provide a written response within 30 days to the project archaeologist, Carissa Scarpa by mail (US Army Corps of Engineers, CENAN-PL-EA, 26 Federal Plaza, Room 2151, New York, NY 10278) or by email to

Carissa.a.scarpa@usace.army.mil. If you or your staff require additional information or have any questions, please contact Ms. Scarpa at (917) 790-8612.

Sincerely,

Peter M. Weppler
Chief, Environmental Analysis Branch

Enclosures

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, NEW YORK DISTRICT
JACOB K. JAVITS FEDERAL BUILDING
26 FEDERAL PLAZA
NEW YORK NY 10278-0090

March 25, 2019

Environmental Analysis Branch

Ms. Nekole Alligood
Cultural Preservation Director
Delaware Nation
P.O. Box 825
Anadarko, OK 73005

Dear Ms. Alligood:

The U.S. Army Corps of Engineers, New York District (District), in partnership with the New York State Department of Environmental Conservation (NYSDEC), has been preparing the draft Hudson River Habitat Restoration (HRHR) Feasibility Study and Environmental Assessment. A report, entitled *Preliminary Historical and Archaeological Assessment for the Hudson River Habitat Restoration Project, Hudson River Basin, New York,* was prepared to identify potential impacts to cultural resources in accordance with NEPA and the National Historic Preservation Act and is enclosed (Enclosure 1). The survey consisted of a review of existing data pertaining to historic and archaeological resources for six restoration sites and an assessment of the potential for adverse effects to cultural resources associated with the recommended restoration measures, or Tentatively Selected Plan (TSP).

The District is recommending restoration measures at five of the six sites that were evaluated in the feasibility study. At this time the District has identified the Area of Potential Effect (APE) for each site and identified any previously documented historic properties that may be impacted by the proposed restoration measures as well as areas that are considered archaeologically sensitive or requiring further investigations. The District has determined that additional investigations will be required at these sites as detailed designs are developed and the APE is better defined to complete a determination of adverse effects to historic properties. To that end the District has elected to develop a Programmatic Agreement (PA) to outline the steps required to carry out the District's remaining Section 106 responsibilities including conducting additional surveys, consulting with interested parties, determining adverse effects, and, if necessary, mitigating for adverse effects (Enclosure 2).

As a tribe with significant cultural heritage in the region, the District would like to take this opportunity to invite you to review and comment upon the survey report and draft PA for the HRHR Project. The PA is also being coordinated with the SHPO, Advisory Council on Historic Preservation, Delaware Tribe of Indians, the St. Regis Mohawk, and the Stockbridge-Munsee Community. The draft PA will be available for public review in the project's draft Integrated Feasibility Report and Environmental Assessment, prepared under the National Environmental Policy Act, which will serve as part of the Corps' Section 106 public coordination.

The District invites the Delaware Nation to participate in the PA and the project as a consulting party. Please provide a written response within 30 days to the project archaeologist, Carissa Scarpa by mail (US Army Corps of Engineers, CENAN-PL-EA, 26 Federal Plaza, Room 2151, New York, NY 10278) or by email to Carissa.a.scarpa@usace.army.mil. If you or your

staff require additional information or have any questions, please contact Ms. Scarpa at (917) 790-8612.

Sincerely,

Peter M. Weppler
Chief, Environmental Analysis Branch

Enclosures

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, NEW YORK DISTRICT
JACOB K. JAVITS FEDERAL BUILDING
26 FEDERAL PLAZA
NEW YORK NY 10278-0090

March 25, 2019

Environmental Analysis Branch

Ms. Bonney Hartley
Stockbridge-Munsee Community
THPO-New York Office
65 1st Street
Troy, NY 12180

Dear Ms. Hartley:

The U.S. Army Corps of Engineers, New York District (District), in partnership with the New York State Department of Environmental Conservation (NYSDEC), has been preparing the draft Hudson River Habitat Restoration (HRHR) Feasibility Study and Environmental Assessment. A report, entitled *Preliminary Historical and Archaeological Assessment for the Hudson River Habitat Restoration Project, Hudson River Basin, New York,* was prepared to identify potential impacts to cultural resources in accordance with NEPA and the National Historic Preservation Act and is enclosed (Enclosure 1). The survey consisted of a review of existing data pertaining to historic and archaeological resources for six restoration sites and an assessment of the potential for adverse effects to cultural resources associated with the recommended restoration measures, or Tentatively Selected Plan (TSP).

The District is recommending restoration measures at five of the six sites that were evaluated in the feasibility study. At this time the District has identified the Area of Potential Effect (APE) for each site and identified any previously documented historic properties that may be impacted by the proposed restoration measures as well as areas that are considered archaeologically sensitive or requiring further investigations. The District has determined that additional investigations will be required at these sites as detailed designs are developed and the APE is better defined to complete a determination of adverse effects to historic properties. To that end the District has elected to develop a Programmatic Agreement (PA) to outline the steps required to carry out the District's remaining Section 106 responsibilities including conducting additional surveys, consulting with interested parties, determining adverse effects, and, if necessary, mitigating for adverse effects (Enclosure 2).

As a tribe with significant cultural heritage in the region, the District would like to take this opportunity to invite you to review and comment upon the survey report and draft PA for the HRHR Project. The PA is also being coordinated with the SHPO, Advisory Council on Historic Preservation, Delaware Nation, Delaware Tribe of Indians, and the St. Regis Mohawk. The draft PA will be available for public review in the project's draft Feasibility Report and Environmental Assessment, prepared under the National Environmental Policy Act, which will serve as part of the Corps' Section 106 public coordination.

The District invites the Stockbridge-Munsee Community to participate in the PA and the project as a consulting party. Please provide a written response within 30 days to the project archaeologist, Carissa Scarpa by mail (US Army Corps of Engineers, CENAN-PL-EA, 26 Federal Plaza, Room 2151, New York, NY 10278) or by email to

Carissa.a.scarpa@usace.army.mil. If you or your staff require additional information or have any questions, please contact Ms. Scarpa at (917) 790-8612.

Sincerely,

Peter M. Weppler
Chief, Environmental Analysis Branch

Enclosures

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, NEW YORK DISTRICT
JACOB K. JAVITS FEDERAL BUILDING
26 FEDERAL PLAZA
NEW YORK NY 10278-0090

March 25, 2019

Environmental Analysis Branch

Mr. Darren Bonaparte
Tribal Historic Preservation Officer
Saint Regis Mohawk
412 State Route 37
Akwesasne, New York 13655

Dear Mr. Bonaparte,

The U.S. Army Corps of Engineers, New York District (District), in partnership with the New York State Department of Environmental Conservation (NYSDEC), has been preparing the draft Hudson River Habitat Restoration (HRHR) Feasibility Study and Environmental Assessment. A report, entitled *Preliminary Historical and Archaeological Assessment for the Hudson River Habitat Restoration Project, Hudson River Basin, New York,* was prepared to identify potential impacts to cultural resources in accordance with NEPA and the National Historic Preservation Act and is enclosed (Enclosure 1). The survey consisted of a review of existing data pertaining to historic and archaeological resources for six restoration sites and an assessment of the potential for adverse effects to cultural resources associated with the recommended restoration measures, or Tentatively Selected Plan (TSP).

The District is recommending restoration measures at five of the six sites that were evaluated in the feasibility study. At this time the District has identified the Area of Potential Effect (APE) for each site and identified any previously documented historic properties that may be impacted by the proposed restoration measures as well as areas that are considered archaeologically sensitive or requiring further investigations. The District has determined that additional investigations will be required at these sites as detailed designs are developed and the APE is better defined to complete a determination of adverse effects to historic properties. To that end the District has elected to develop a Programmatic Agreement (PA) to outline the steps required to carry out the remaining Section 106 responsibilities including conducting additional surveys, consulting with interested parties, determining adverse effects, and, if necessary, mitigating for adverse effects (Enclosure 2).

As a tribe with significant cultural heritage in the region, the District would like to take this opportunity to invite you to review and comment upon the survey report and draft PA for the HRHR Project. The PA is also being coordinated with the SHPO, Advisory Council on Historic Preservation, Delaware Nation, Delaware Tribe of Indians, and the Stockbridge-Munsee Community. The draft PA will be available for public review in the project's draft Integrated Feasibility Report and Environmental Assessment, prepared under the National Environmental Policy Act, which will serve as part of the Corps' Section 106 public coordination.

The District invites the Saint Regis Mohawk to participate in the PA and the project as a consulting party. Please provide a written response within 30 days to the project archaeologist, Carissa Scarpa by mail (US Army Corps of Engineers, CENAN-PL-EA, 26 Federal Plaza, Room 2151, New York, NY 10278) or by email to Carissa.a.scarpa@usace.army.mil. If you or your

staff require additional information or have any questions, please contact Ms. Scarpa at (917) 790-8612.

Sincerely,

Peter M. Weppler
Chief, Environmental Analysis Branch

Enclosures

NEW YORK STATE OF OPPORTUNITY. | Parks, Recreation and Historic Preservation

ANDREW M. CUOMO
Governor

ERIK KULLESEID
Acting Commissioner

April 26, 2019

Carissa Scarpa
Project Archaeologist
U.S. Army Corps of Engineers
26 Federal Plaza, room 2142
New York, NY 10278
(via email)

Re: ACE
Hudson River Habitat Restoration Ecosystem Restoration Feasibility Study
Multiple Counties
18PR07469

Dear Ms. Scarpa:

Thank you for requesting the comments of the State Historic Preservation Office (SHPO). We have reviewed the draft Programmatic Agreement in accordance with Section 106 of the National Historic Preservation Act of 1966.

Overall we have few comments relating to the substance of the proposed alternate Section 106 procedure. We note that the New York SHPO has not established formal state-wide contexts for archaeological, architectural or historic resources. We also request that all projects and reports under this agreement be submitted to our office using our Cultural Resource Information System (CRIS). We also have updated our signatory line.

At this point in time the NYSHPO has no further comments. If I can be of any further assistance, please do not hesitate to contact me at (518) 268-2166 or john.bonafide@parks.ny.gov.

Sincerely,

John A. Bonafide
Director,
Technical Preservation Services Bureau
Agency Historic Preservation Officer

att: DRAFT Programmatic Agreement

DRAFT PROGRAMMATIC AGREEMENT
AMONG
THE U. S. ARMY CORPS OF ENGINEERS, NEW YORK DISTRICT,
AND THE NEW YORK STATE HISTORIC PRESERVATION OFFICE,
REGARDING
THE HUDSON RIVER HABITAT RESTORATION PROJECT

WHEREAS, the U.S. Army Corps of Engineers, New York District, (New York District), has been authorized under the Section 551 of the Water Resources Development Act of 1996 to conduct a feasibility study to evaluate federal participation in ecosystem restoration along the Hudson River and its tributaries. The studies purpose is to determine the feasibility of carrying out ecosystem restoration measures that would restore a mosaic of large river habitats and lost connectivity within the Hudson River and connected ecosystems; and

WHEREAS, The Hudson River Habitat Restoration (HRHR) Study Area consists of the Hudson River and its tributaries from the Tappan Zee Bridge to the Troy Lock and Dam, a length of approximately 125 miles; and

WHEREAS, through a screening process the New York District selected six sites out of 1,665 potential restoration sites to carry forward for the feasibility study and five to recommend for construction. These five sites are Binnen Kill, Schodack Island State Park, Henry Hudson Park, AOP 1 on Roundout Creek, and AOPs 1, 2, and 3 on Moodna Creek (Appendix A); and

WHEREAS, the New York District has defined the "Area of Potential Effect" (APE) for this Undertaking to include all areas within the five sites where restoration measures are planned as well as the associated staging areas that are yet to be determined; and

WHEREAS, the New York District has conducted a preliminary historical and archaeological assessment for the six restoration sites selected for further analysis. The survey consisted of compiling existing information and a pedestrian survey. Data was gathered on historic sites and districts, archaeological sites and sensitivity areas, and National Register of Historic Places (NRHP)-eligible and listed resources which are located within the restoration site boundaries and within a one-mile buffer surrounding each site. In addition to the restoration sites and boundary areas, background history, and environmental and cultural resources data was collected for the entire HRHR study area and the individual sites; and

WHEREAS, the New York District has determined that properties listed and/or eligible for listing on the National Register of Historic Places (NRHP) may be adversely affected by implementation of the proposed restoration measures; and

DRAFT

WHEREAS, for all five sites additional survey is required to determine the presence or absence of significant cultural resources and to make a final assessment of adverse effects; and

WHEREAS, the New York District, in consultation with the New York State Historic Preservation Office (NYSHPO) and other interested parties, plans to carry out additional work to identify significant resources, develop treatment plans and mitigation plans, if necessary, for the proposed undertaking to ensure that the project will avoid or minimize adverse effects to significant historic properties and archaeological sites; and

WHEREAS the New York District is coordinating, and shall continue to coordinate a public outreach program for this undertaking which in the past has consisted of a number of public meetings and the circulation of cultural resource and environmental documents related to the Section 106 review process; and

NOW, THEREFORE, the New York District and the NYSHPO agree that the project shall be administered in accordance with the following stipulations to satisfy the New York District's Section 106 responsibilities for all individual actions of the Undertaking.

Stipulations

The New York District shall ensure that the following measures are carried out:

I. IDENTIFICATION AND EVALUATION

A. The New York District shall carry out surveys for each restoration site that is advanced past the feasibility phase to identify significant cultural resources within the APE. Survey methodology shall be tailored to the unique environment of the restoration site to identify resources and will consider previous survey results and consultation comments when designing the surveys.

B. Prior to the initiation of construction-related activities which may affect historic properties, the New York District, in consultation with the NYSHPO and other interested parties, shall identify and evaluate:

1. Archaeological Sites

a. The New York District shall ensure that archaeological surveys within the uninvestigated portions of the APE are conducted in a manner consistent with the Secretary of the Interior's Standards and Guidelines for Identification (48 FR 44720-23) and guidelines set forth by the NYSHPO including the New York Archaeological Council's Standards for Cultural Resource Investigations and the Curation of Archaeological Collections in New York State (1994, adopted by NYSHPO in 1995), and take into account the National Park Service publication

DRAFT

The Archaeological Survey: Methods and Uses (1978) and the statewide historic contexts developed by the NYSHPO.

b. The scopes of work and survey reports shall be submitted to the NYSHPO via the CRIS program and other consulting parties for review and comment.

2. Traditional Cultural Properties.

a. The New York District shall ensure that surveys within the uninvestigated portions of the APE include procedures to identify traditional cultural properties and to consult with federally recognized tribes and other affected parties in accordance with the guidelines provided by National Park Service Bulletin 38, Guidelines for Evaluating and Documenting Traditional Cultural Properties.

b. In the event that a federally recognized tribe or affected group contacts the New York District regarding its recognition of a traditional cultural property, located within the APE, the New York District shall notify the SHPO and the ACHP to initiate discussions to consider whether the property is a traditional cultural property that meets the Criteria.

3. Buildings and Structures

a. The New York District shall ensure that surveys are conducted for buildings and structures in the APE in a manner consistent with the Secretary of the Interior's Standards and Guidelines for Identification (48 FR 44720-23) and which takes into account the statewide historic contexts developed by the NYSHPO. The Scope of Work and survey report will be consistent with the guidelines set forth by the NYSHPO and shall be submitted to the SHPO via the CRIS program and other consulting parties for review.

b. The New York District, in consultation with the NYSHPO and other consulting parties, shall identify and evaluate buildings and structures that are located adjacent to NRHP listed or eligible historic districts to determine whether such properties should be considered as part of the historic district or an expanded district.

4. Historic Landscapes and View Sheds

a. The New York District shall consult with the NYSHPO and other consulting parties, including local historical societies, to identify and evaluate historic landscapes and viewsheds located within the APE. The New York District shall consult National Park Service Bulletins 18, How to Evaluate and Nominate Designed Historic Landscapes, and 30 Guidelines for Evaluating and Documenting Rural Historic Landscapes, National Park Service Preservation Brief 36, Protecting Cultural Landscapes, and other publications and materials made available by the NYSHPO to assist in defining the criteria that should be

DRAFT

applied to such properties.

b. The objective in conducting the surveys is to identity NRHP-listed or eligible historic landscapes and affected viewsheds within the project area that may be adversely affected by the Undertaking, and to determine whether they meet the NRHP criteria set forth in 36 CFR Part 60.4.

C. The New York District shall ensure that qualified professionals meeting the National Park Service professional qualifications for the appropriate discipline [National Park Service Professional Qualification Standards, Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation (48 FR 44738-39)] are used to complete all identification and evaluation plans related to this undertaking, to include geomorphological, palynological, and archaeological surveys and testing, and documentation.

D. The New York District, the NYSHPO, and all other consulting parties shall consider the views of the public and interested parties, including local historic preservation groups, in completing its identification and evaluation responsibilities.

E. The New York District shall maintain records of all decisions it makes related to the NRHP eligibility of properties.

F. Application of Criteria:

1. The New York District, in consultation with the NYSHPO and other consulting parties, shall evaluate historic properties using the Criteria established for the NRHP [36 CFR 800.4(c)(1)]:

a. If the New York District, the NYSHPO, and the other consulting parties agree that the Criteria apply or do not apply, in evaluating the NRHP eligibility of a property, the property shall be treated accordingly for purposes of this PA.

b. If the New York District, the SHPO, and other consulting parties disagree regarding NRHP eligibility, prior to the start of any project-related work at the site or in the vicinity of the property, the New York District shall obtain a formal Determination of Eligibility (DOE) from the Keeper of the National Register (Keeper), National Park Service, whose determination shall be final.

G. The New York District shall ensure that the identification and evaluation of historic properties that may be affected by each phase of the Undertaking is completed prior to the initiation of any formal action by the Corps including rehabilitation, relocation, demolition, etc.

II. TREATMENT OF HISTORIC PROPERTIES.

DRAFT

The New York District shall adhere to the following treatment strategies in order to avoid adverse effects to historic properties.

A. The New York District shall ensure that treatment plans are developed and implemented for all historic properties determined eligible for listing in the NRHP that may be affected by project activities. Unless the SHPO or other consulting parties object within 30 days of receipt of any plan, the New York District shall ensure that treatment plans are implemented by the New York District or its representative(s). The New York District shall revise plans to address comments and recommendations provided by the SHPO and the other consulting parties.

B. The New York District shall ensure that qualified professionals meeting the NPS professional qualifications for the appropriate discipline [NPS Professional Qualification Standards, Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation (48 FR 44738-39)] are used to develop and implement all treatment plans.

C. Avoidance. The preferred treatment is avoidance of effects to prehistoric sites and historic properties. The New York District shall, to the extent feasible, avoid significant archaeological sites through design changes. The New York District, the SHPO(s), and consulting parties shall consult to develop plans for avoiding impacts to NRHP-eligible sites. The New York District shall incorporate feasible avoidance measures into study activities as part of the implementation of the restoration measures. If avoidance is determined to be infeasible, the New York District shall develop and implement treatment/mitigation plans in consultation with the NYSHPO and other consulting parties.

D. Preservation in Place. When the New York District, the NYSHPO and the other consulting parties agree that complete avoidance of historic properties is infeasible, the New York District shall explore preservation in place, if appropriate. Preservation in place may entail partial avoidance or protection of historic properties against project-related activities in proximity to the historic property. The New York District shall preserve historic properties in place through project design, such as incorporating color, texture, scale, and materials, which are compatible with the architectural or historic character of the historic property, use of fencing, berms or barricades, preservation of vegetation including mature trees, landscaping and planting that would screen the property.

III. RESOLUTION OF ADVERSE EFFECTS

A. If the New York District, in consultation with the NYSHPO and other consulting parties, determines that the Undertaking will have an adverse effect on historic resources, the New York District shall:

DRAFT

1. Consult to develop alternatives to mitigate or minimize adverse effects. The analysis of alternatives shall consider program needs, cost, public benefit and values, and design feasibility.

2. Develop a Standard Mitigation Agreement (SMA) with the SHPO and other consulting parties; or

3. Consult with the ACHP to develop a Memorandum of Agreement (MOA) in accordance with 36 CFR Part 800.6 (c).

B. Development of Standard Mitigation Agreements (SMA).

1. The New York District, in consultation with the NYSHPO and consulting parties, shall develop SMAs for historic properties which will be adversely affected by the Undertaking. The New York District shall submit all SMAs to the NYSHPO and the other consulting parties for review and approval. The NYSHPO and other consulting parties shall have 30 days from receipt of adequate information in which to review and comment on the SMAs. If the consulting parties fail to respond within 30 days, or if there is disagreement, the New York District shall work with the consulting parties to develop the proposed SMA into an MOA and submit copies of background information and the proposed SMA to facilitate consultation to develop an MOA in accordance with 36 CFR Part 800.

2. After signing by the New York District and the NYSHPO, the New York District shall file all SMAs with the ACHP.

3. SMAs developed between the New York District and the NYSHPO may include one or more of the following stipulations which address routine adverse effects that may occur to historic properties as a result of Study implementation.

a. Recordation. The New York District shall consult with the NYSHPO to determine the appropriate level and type of recordation for affected resources. For historic properties with state and/or local significance, recordation shall be consistent with the requirements and standards of the Department of the Interior (October 1997). HABS/HAER documentation may also be required.

b. Salvage and Donation of Significant Structural Elements. Prior to removal, partial removal, or substantial alteration of historic properties, the New York District, in consultation with the NYSHPO, shall develop a salvage and donation plan to identify appropriate parties willing and capable of receiving and preserving the salvaged significant structural elements.

c. Archaeological Data Recovery. The New York District shall conduct data recovery on archaeological sites following agreement on the perspective data recovery and treatment plans between the New York District and the NYSHPO when the archaeological sites are eligible for National Register inclusion under

DRAFT

additional Criteria than Criterion D (for the information which they contain) or when the full informational value of the site cannot be substantially preserved through the conduct of appropriate research to professional standards and guidelines. To the maximum extent feasible, data recovery and treatment plans shall be developed to take into account and mitigate for the fullest range of archaeological site values and significance.

IV. DISCOVERY

A. If previously unidentified and unanticipated historic resources are discovered during implementation of the Undertaking, the New York District shall cease all work in the vicinity of the discovered historic resource until it can be evaluated pursuant to the guidelines in Stipulations I and II of this PA. If the property is determined to be eligible, the New York District shall consult with the NYSHPO and other consulting parties to develop a treatment plan or SMA in accordance with Stipulation III of this PA.

B. The New York District shall implement the treatment plan or SMA once approved by the SHPO.

V. TREATMENT OF HUMAN REMAINS:

A. If any human remains and/or grave-associated artifacts are encountered, the New York District, the NYSHPO and Tribes shall consult to develop a treatment plan that is responsive to the ACHP's "Policy Statement Regarding Treatment of Burial Sites, Human Remains and Funerary Objects" (February 23, 2007), the Native American Grave Protection and Repatriation Act, As Amended (PL 101-601, 25 U.S.C. 3001 et seq.), the U.S. Army Corps of Engineers, Tribal Consultation Policy (4 October 2012).

B. Human remains must be treated with the utmost respect and dignity. All work must stop in the vicinity of the find and the site will be secured.

C. The medical examiner/coroner, local law enforcement, the SHPO and Tribes will be notified. The coroner and local law enforcement will determine if the remains are forensic or archaeological in nature.

D. If the remains are determined to be archaeological in nature a forensic anthropologist will be employed to determine whether the remains are Native American or of other origin.

E. If the human remains are determined to be Native American they shall be left in place and protected from further disturbance until a treatment plan has been developed and approved by the New York District, SHPO and Tribes.

DRAFT

F. If human remains are determined to be non-Native American, the remains will be left in place and protected from further disturbance until a plan for avoidance or removal is developed and approved by the New York District, SHPO, Tribes and other parties, as appropriate.

VI. COORDINATION OF REVIEWS FOR STUDY ACTIVITIES

A. All plans, documents, reports, and materials shall be submitted by the New York District (or its representative) to the NYSHPO via New York's CRIS program, and other consulting parties by mail, for a 30 day review period unless otherwise stipulated in this PA. If the NYSHPO and other consulting parties fail to comment within the specified time the New York District shall assume the agencies concurrence.

B. When interested parties are participating in the review of activities or actions outlined in this PA (i.e., consulting parties) the New York District shall ensure that all parties are provided documentation at the time it is forwarded to the SHPO, and afforded a 30 day review period. As appropriate, the New York District shall submit the comments of interested parties to the SHPO to facilitate further consultation.

C. If, after consulting with the SHPO and other consulting parties for a period of 90 days on any action or activity provided for in this PA, the New York District and the SHPO conclude there is no progress in developing treatment/mitigation plans or other documents required by this PA, the ACHP shall be asked to resolve the matter.

D. The New York District shall ensure that all submissions to the SHPO and all other consulting parties include all the relevant information required to facilitate their review. The New York District shall provide all additional information requested by the SHPO and other consulting parties within a timely manner unless the signatories to this PA agree otherwise.

E. The New York District shall ensure that all draft and final reports resulting from actions pursuant to the Stipulations of this PA will be provided to the SHPO and other consulting parties and will identify the Principal Investigator responsible for the report. All reports will be responsive to contemporary standards, and as appropriate to the Department of the Interior's Format Standards for Final Reports of Data Recovery Programs (42 FR 5377-79) and SHPO report standards. Precise locational data may be provided only in a separate appendix if it appears that its release could jeopardize archaeological sites consistent with National Register Bulletin Number 29, Guidelines for Restricting Information about Historic and Prehistoric Resources. All reports will be submitted in digital format via New York's CRIS program.

DRAFT

F. If the District proposes revisions or addenda to SHPO-approved treatment/ mitigation plans or other documents, the New York District and the SHPO shall meet to determine whether additional conditions or mitigation measures are appropriate. Any revisions to the treatment/mitigation plans shall be provided to the SHPO, the ACHP, and the other consulting parties for review and approval prior to implementation.

G. The New York District shall certify in writing that all requirements for identification and evaluation, and the implementation of treatment/mitigation plans have been satisfactorily completed prior to the initiation of construction activities. The New York District shall submit a copy of this certification to the SHPO, the ACHP, and other consulting parties by mail. The SHPO, ACHP, and other consulting parties shall have 30 days to object to the certification based a finding of incomplete compliance or inadequate compliance with the terms of this PA. If, after 30 days, no objections are received, the District may proceed with construction.

VII. ADMINISTRATIVE TERMS

A. Review Periods

The SHPO and other consulting parties shall have 30 days to review and /or object to determinations, evaluations, plans, reports, and other documents submitted to them by the New York District.

B. Dispute Resolution

The New York District and consulting parties shall attempt to resolve any disagreement arising from implementation of this PA. If there is a determination that the disagreement cannot be resolved, the New York District shall request the ACHP's recommendations or request the comments of the ACHP in accordance with 36 CFR Part 800.6(b).

Any ACHP recommendations or comments provided in response will be considered in accordance with 36 CFR Part 800.6(c)(2), with reference only to the subject of the dispute. The New York District shall respond to ACHP recommendations or comments indicating how the New York District has taken the ACHP's recommendations or comments into account and complied with same prior to proceeding with Undertaking activities that are subject to dispute. Responsibility to carry out all other actions under this PA that are not the subject of the dispute will remain unchanged.

C. Public Involvement

In consultation with the SHPO, the New York District shall develop a plan to inform the interested parties of the existence of this Agreement. Copies of this Agreement and relevant documentation prepared pursuant to the terms of this PA shall be made available for public inspection (information regarding the locations of archaeological sites will be withheld in accordance with the Freedom of Information Act and National Register

DRAFT

Bulletin 29, if it appears that this information could jeopardize archaeological sites). Any comments received from the public under this Agreement shall be taken into account by the New York District.

Public Objections. The New York District shall review and resolve timely substantive public objections. Public objections shall be considered timely when they are provided within the review periods specified in this PA. The New York District shall consult with the relevant consulting parties and as appropriate with the Council, to resolve objections. Study actions which are not the subject of the objection may proceed while the consultation is conducted.

D. Monitoring

The New York District shall prepare annual reports summarizing the status of compliance with the terms of this PA and a summary of the completed activities and the exempt activities for the past year and proposed activities for the next fiscal year. Reports shall be submitted by January 31 of every year. The Annual Reports shall be provided to the ACHP, the SHPO, all other signatories and interested parties until the Study-related activities are complete.

The ACHP and the SHPOs may request a site visit to follow up information in the annual report or to monitor activities carried out pursuant to this PA. The ACHP and the SHPO shall provide the New York District with 30 days written notice when requesting a site visit unless otherwise agreed. The New York District may also schedule a site visit with the SHPOs and the ACHP at its discretion.

E. Amendments

Any signatory to this PA may request that it be amended, whereupon all the parties will consult in accordance with 36 CFR Part 800.6(b)(7) to consider such amendment.

F. Termination

Any signatory to this PA may terminate it by providing thirty days' notice to the other parties, provided that the parties will consult during the period prior to termination by certified mail to seek agreement on amendments or other actions that would avoid termination. In the event of termination, the New York District will comply with 36 CFR Parts 800.4 through 800.6 with regard to individual undertakings covered by this Agreement.

G. Sunset Clause

This PA will continue in full force and effect until the Undertaking is complete and all terms of this PA are met, unless the Undertaking is terminated or authorization is rescinded.

DRAFT

H. Anti-Deficiency Act

All requirements set forth in this PA requiring expenditure of funds by the New York District are expressly subject to the availability of appropriations and the requirements of the Anti-Deficiency Act (31 U.S.C. 1341). No obligation undertaken by the New York District under the terms of this PA shall require or be interpreted to require a commitment to extend funds not appropriated for a particular purpose. If the New York District cannot perform any obligation set forth in this PA because of unavailability of funds, that obligation must be renegotiated among the New York District and the signatories as necessary.

Execution and implementation of this PA evidences that the New York District has satisfied its Section 106 responsibilities for all individual Undertakings of the Project, and that the New York District has afforded the ACHP an opportunity to comment on the Undertaking and its effects on historic properties.

DRAFT

U.S. ARMY CORPS OF ENGINEERS

By: _____ Date: _____
Col. Thomas D. Asbery, New York District Commander

NEW YORK STATE HISTORIC PRESERVATION OFFICE

By: _____ Date: _____
R. Daniel Mackay, Deputy Commissioner for Historic Preservation/Deputy State Historic Preservation Officer

Appendix A: HRHR Restoration Sites and Selected Alternatives

DRAFT

Preliminary Historical and Archaeological Assessment for the Hudson River Habitat Restoration Project Hudson River Basin, New York

Prepared by:

Carissa Scarpa, M.A., R.P.A.

U.S. Army Corps of Engineers

New York District

March 2019

Table of Contents

Introduction 3
Project Description 3
Description of Documentary Research 6
Prehistory of the Hudson Valley 6
History of the Hudson Valley 7
Binnen Kill 8
Schodack Island State Park 15
Henry Hudson Park 23
Charles Rider Park 28
Moodna Creek 32
Rondout Creek - Eddyville Dam 42
Conclusion 47
References 48

Appendix A – Restoration Site Alternatives
Appendix B – New York State CRIS Data

Table of Figures

Figure 1: HRHR Study Area 4
Figure 2: Map of Six Restoration Sites 5
Figure 3: Binnen Kill Study Area 9
Figure 4: Binnen Kill 10
Figure 5: 1891 Map of the Binnen Kill Study Area (Taken from Miller et al. 2017) 12
Figure 6: 1907 Map of the Binnen Kill Study Area (Taken from Miller et al. 2017) 13
Figure 7: Map of Cultural Resources within the Binnen Kill Study Area (Taken from Miller et. al. 2017) .. 15
Figure 8: Schodack Island State Park Study Area 17
Figure 9: Schodack Island State Park 18
Figure 10: Historic Islands at Schodack 21
Figure 11: Map of Cultural Resources in the Schodack Island Study Area (Taken from Cheplowitz 2015) 22
Figure 12: Henry Hudson Park Study Area 24
Figure 13: Henry Hudson Park 25
Figure 14: 1891 Map of Henry Hudson Park (Beers) 27
Figure 15: Charles Rider Park Study Area 29
Figure 16: Charles Rider Park 30
Figure 17: 1891 Map of Charles Rider Park Study Area 31
Figure 18: Moodna Creek Sites 32
Figure 19: Moodna Creek Study Areas 33
Figure 20: Moodna Creek AOP 1 34
Figure 21: Moodna Creek AOP 2 35
Figure 22: Moodna Creek AOP 3 37
Figure 23: Historic Map of AOP 1 Study Area (Beers 1891) 38
Figure 24: Historic Map of the AOP 2 Study Area (Lathrop 1903) 39
Figure 25: Historic Map of the AOP 3 Study Area 40
Figure 26: Artist's Rendering of Orr's Mills (Lathrop 1903) 41
Figure 27: Eddyville Dam 43
Figure 28: Rondout Creek Study Area 44
Figure 29: Canal Features in the Vicinity of the Study Area (Source: Dan Miller, NYSDEC) 46
Figure 30: Historic Map of the Rondout Creek Study Area (Beers 1891) 47

Introduction

The U.S. Army Corps of Engineers, New York District (District) in partnership with the New York State Department of Environmental Conservation (NYSDEC) and New York State Department of State (NYSDOS), are carrying out a feasibility study to investigate potential opportunities for ecosystem restoration in the Hudson River. The study is authorized under Section 551 of the Water Resources Development Act of 1996 (P.L. 104-303). At this time the District is preparing an Integrated Feasibility Report and Environmental Assessment that presents recommendations for federal participation in ecosystem restoration projects that are technically feasible, environmentally acceptable, and meets the objective of both restoring a mosaic of interconnected, large river habitats, and restoring lost connectivity within the Hudson River and other regional ecosystems.

A Reconnaissance Study of the Hudson River Channel Federal Navigation Project was initiated in 1994 under Section 216 of the Harbors and Rivers Flood Control Act of 1970 which authorized a review of completed projects that cause significant change to physical and economic conditions. The reconnaissance study identified degradation of the ecosystems within the Hudson River and tributaries that have been partially caused by multiple U.S. Army Corps of Engineers navigation projects. Beginning in the late 18th Century, the U.S. Army Corps of Engineers built longitudinal dikes, a navigations channel, and placed dredge material in back channels between islands and in shallow marshes. The study recommendations led to the authorization of the current study in 1995.

As a federal undertaking the Hudson River Habitat Restoration (HRHR) Project is subject to review under Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, and implementing regulations 36 CFR 800. Section 106 requires all federal agencies to take into account the effect of their undertakings on cultural resources listed or eligible for listing in the National Register of Historic Places (NRHP) (36 CFR 60). The agency must also afford the Advisory Council on Historic Preservation (ACHP) the opportunity to comment on the undertaking. The Section 106 process is coordinated at the state level by the State Historic Preservation Office (SHPO), which in New York operates within the office of the New York State Office of Parks, Recreation, and Historic Preservation (NYSOPRHP).

Project Description

The Hudson River Habitat Restoration Study Area encompasses the Hudson River and its tributaries from the Tappan Zee Bridge to the Troy Lock and Dam, a length of approximately 125 miles (Figure 1). Through a screening process and in coordination with partners and interested parties the study team selected six sites out of 1,665 potential restoration sites and projects to carry forward into development. These are Binnen Kill, Schodack Island, Henry Hudson Park, Charles Rider Park, and tributary connectivity measures (dam removals) along Moodna Creek and Rondout Creek (Figure 2). The six sites are generally sorted into three categories based on the problems they are addressing.

Figure 1: HRHR Study Area

Large River Mosaics

At Binnen Kill and Schodack Island the goal is to restore historically significant large river ecosystems and side channels that included diverse habitat mosaics of subtidal, intertidal, shoreline, and riparian ecosystems. Proposed measures include large scale dredging and re-contouring to create side channels, shoreline stabilization, native planting, invasive species removal, and culvert removal.

Shoreline Restoration

Charles Rider Park and Henry Hudson Park are shoreline restoration projects. The proposed restoration measures included bank shaping and/or cribbing, planting, rip rap for stabilization and grading aimed at restoring riparian and wetland habitat and addressing active bank erosion and shoreline retreat along the mainstem of the Hudson River.

Tributary Connectivity

The removal of impediments on the Rondout Creek and Moodna Creek would address connectivity between the mainstem of the Hudson River and ecologically important tributaries, with a particular emphasis on aquatic organism passage (AOP) issues opening significant amounts of high quality habitat to important migratory fish species. Removal of impediments will allow anadromous fish (including American shad, striped bass, alewife, blueback and river herring) to spawn providing protective nursery grounds for larval and juvenile life stages and allowing catadromous fish (such as American eel) to return home to freshwater tributaries. Dam removal also improves hydrology and sediment loading for wetland creation and accretion and long-term sustainability of downstream habitat.

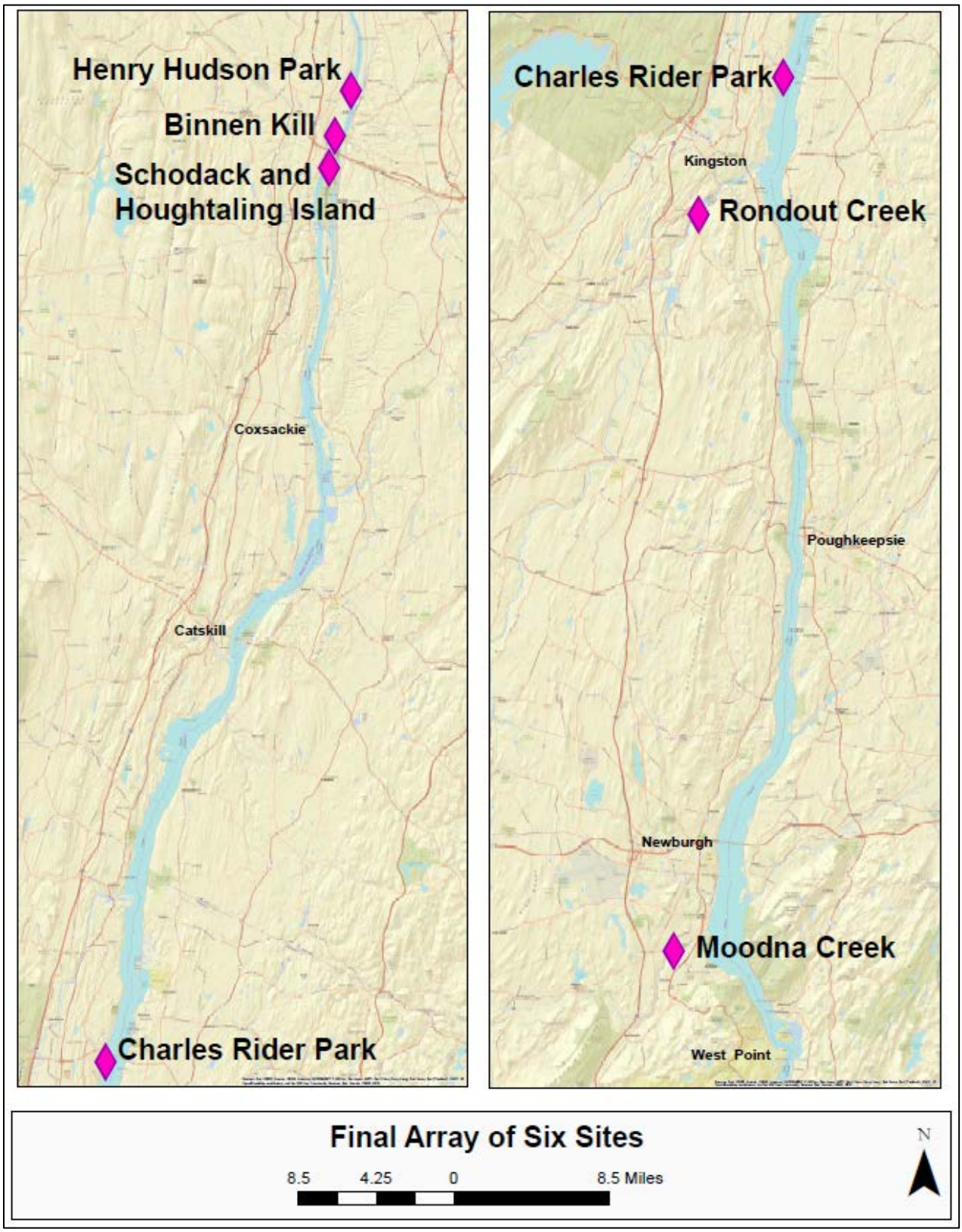


Figure 2: Map of Six Restoration Sites

Description of Documentary Research

Each site was subject to a review of existing data pertaining to historic and archaeological resources. Study area boundaries encompassed all the areas where restoration measures were being considered (see Appendix A for Alternatives). Research was initiated using the New York State Cultural Resources Information System (CRIS), which is maintained by the New York SHPO within the Office of Parks, Recreation, and Historic Preservation (OPRHP). CRIS contains a comprehensive inventory of archaeological sites, State and National Register (NR) properties, properties determined eligible for the NR, and previous cultural resources surveys. Archaeological sites were inventoried within one mile of the project area. Previously reported archaeological sites provided an overview of the types of sites that may be present in the project area. This was taken into consideration when estimating the potential for different types of archaeological sites to exist within the study areas, however, the presence of few reported sites was not considered an indicator of low human activity in the area because this may be the result of a lack of previous systematic surveys. Historic properties within or adjacent to each project area were inventoried for this investigation as well and all cultural resources surveys within the vicinity of the project areas were summarized to provide an indication of the level of survey coverage for each site. Finally, historic maps and histories were reviewed for each project area to trace the development of each site as well as to determine the potential for archaeological sites and put previously documented historic sites into context.

Prehistory of the Hudson Valley

Archaeologists have divided the Precontact cultural history of New York into three (3) general periods: Paleoindian (12,000 to 9500 years before present [BP]); Archaic (9500 to 3000 BP) and Woodland (3000 to 500 BP). These periods are further subdivided into the Early (9500 to 7000 BP), Middle (7000 to 5500 BP) and Late (5500 to 3000 BP) Archaic periods and the Early (3000 to 1700 BP), Middle (1700 to 1200 BP) and Late (1200 to 500 BP) Woodland periods. The Late Woodland period ends with European contact which ushers in the Contact period (500 to 300 BP) and finally the Historic period extends from 300 BP to present.

People may have begun to occupy the Hudson Valley beginning around 12,000 years ago with the retreat of the Wisconsin glaciation. The Paleoindian period is generally characterized by highly organized mobile bands of people whose subsistence strategies were adapted to tundra and boreal forest environments present at the end of the Pleistocene. Paleoindians hunted large and small game and were adept at exploiting local plants for food (Ritchie 1994). A limited number of habitation sites from the Paleoindian period have been identified in the Northeast and generally consist of quarry sites, small base camps, and isolated kill sites. They tend to occur in lowlands adjacent to water, upland bluffs, and ridgetops (Miller et. al. 2017).

As the climate continued to warm, resulting in greater biodiversity, a corresponding cultural shift occurred. Changes in settlement and subsistence patterns, as well as technology, are reflected in the archaeological record from the Archaic period. Hunting and gathering continued as the main focus of subsistence, though a much wider resource base was available to be exploited, resulting in more diverse tool kit assemblages. Populations likely expanded throughout the period and settlements followed more seasonal resource cycles. Pottery and smoking pipes become common in the Middle and Late Archaic

periods. Numerous Archaic sites have been documented in New York with the majority dating to the Late Archaic period (Miller et. al. 2017).

The Woodland period is characterized by a shift towards more sedentary and permanent or semi-permanent, residential or village settlements as well as plant cultivation, advanced pottery techniques, and development of elaborate trade and ceremonial activities. Several large sites dating to the Middle and Late Woodland periods have been identified on lowland terrace settings within the Hudson Valley (Miller et. al. 2017).

At the time of European contact the Hudson Valley was inhabited by the Algonquin people who identified as either Lenape (Delaware), the Wappingers, and the Mahicans. Most individuals lived in small villages that were situated in near proximity to the Hudson River and its tributaries. Their subsistence consisted of cultivating crops of corn, beans, and squash, hunting wild turkey, deer and small game and fishing for striped bass, herring, sturgeon and shad. They also made use of naturally occurring fruits and nuts as well as oysters from the Rivers (Alfieri 1999). Settlements and small camp sites were strategically located to take advantage of available resources such as rock outcrops where raw materials could be mined for tools and weapon manufacture.

History of the Hudson Valley

European presence within the lower Hudson Valley began in the early 1500's. Henry Hudson sailed his ship, the Half Moon, north along the Hudson River in 1609 in search of a northwest passage and it was his reports on the quality of the land that convinced many to settle the region. In 1621 the Dutch West India Company began exploring the many economic opportunities available in the Hudson Valley and in 1625 the colony of New Netherland was established which included parts of New York, New Jersey, Delaware, Connecticut, Pennsylvania, and Rhode Island. Fur trading was the dominant business in the 1600s. Three early outposts established by the Dutch for trade were the city of New Amsterdam (New York, Wiltwyck, later renamed Kingston, and Fort Orange, later renamed Albany (Rink 1986). New Amsterdam was the colony's capital city and merchant hub with many outposts set up along the Hudson River for trade. The Dutch rule of New Netherland was lucrative for a time but became troubled as a result of soured relations with the Native tribes in the region and a border dispute with the English. The Dutch eventually lost New Netherland to the English in the late 1600s. Under the British the Hudson Valley became a major agricultural powerhouse which produced large quantities of grain for export to England.

During the Revolutionary War the Hudson River played a major role as it provided access to the Great Lakes via the Mohawk River and to Lake George and Lake Champlain which allowed the British to control the water route between Montreal and New York City and cut off the Continental Army from New England. Several important battles were fought within the Hudson Valley including the Battle of White Plains and the Battle of the Hudson Highlands.

In the Nineteenth Century new transportation corridors made the Hudson River Valley an important industrial center. The Erie Canal, which opened in 1825, connected the Hudson River Valley to the Midwest and Great Lakes region. The Mohawk and Hudson Railroad, which opened in 1831 between Albany and Schenectady improved travel from the Hudson Valley to the west. Over the course of the next half a century many rail lines would be constructed up and down the Hudson Valley including the

New York Central and Hudson River Railroad. This improvement to transportation led to the construction of hundreds of factories in towns such as Poughkeepsie, Newburgh, Kingston, and Hudson. New river boating technologies, such as steamboats, improved transport along the River itself and increased the volume of goods that could be transported from the Midwest to New York City (Stanne 1996).

Tourism within the Hudson River Valley became a major industry beginning in the 1800s. With the advent of the steamboat came hotels and resorts that catered to Middle and Upper class individuals and families looking to escape the poor air quality and heat of the cities. Novels of the time and paintings such as those produced by the Hudson River School painters romanticized the Hudson Valley as a pastoral and peaceful region and drew visitors looking to for a bit of untouched American wilderness (Harmon 2004).

Binnen Kill

Project Description

The Binnen Kill site is located on the west shore of the Hudson River in the Towns of Bethlehem and Coeymans, in Albany County, New York. The site, where proposed actions would be implemented, is limited to a low-lying river terrace of approximately 1,000 acres extending at its southern boundary from Castleton-on Hudson Bridge (Route 912M) to approximately two miles to the north (Figure 3). The Binnen Kill Channel descends a steep slope from the west and turns towards the south, flowing through the terrace before joining the Hudson at the south end of the site. The eastern edge of the site, adjacent to the Hudson River, previously consisted of three islands (Shad, Schermerhorn, and Poplar), which have since been joined to the mainland, primarily due to the historic placement of dredged material. The terrace is a mixture of tidal and other wetlands, shrubs, forest, and current or former agricultural fields. Recent development at the site has been minimal with the exception of a water treatment facility with groundwater wells at the northern end, which is currently in operation. Several gravel roads are present on the site including an access road connecting to River Road. The Castleton-on-Hudson Bridge, railroad tracks, and an electrical transmission line cross the southern edge of the site. Additionally, the site has several culvert crossings on both former and active gravel access roads.

Six alternatives were developed as part of this project; four alternatives for the north component and two alternatives for the south component (see Appendix A). The alternatives consisted of varying combinations and scales of measures including wetland restoration involving removal of invasive species and planting of native species, enlarging a culvert to ensure passage of aquatic organisms, creation of forested wetland and emergent wetland and creation of four connected pools along approximately 3,700 linear feet of new channel with varying widths to support emergent and forested wetland communities. The tentatively selected plan for the site consists of Alternative 4 in the North and Alternative 2 in the South. The selected plan consists of side channel and tidal wetland corridor creation with approximately 64 acres of Wetland and Emergent and Forested Wetland creation in the north and side channel and tidal wetland corridor creation with construction of a road crossing for vehicular traffic and approximately 21 acres of wetland creation in the south.

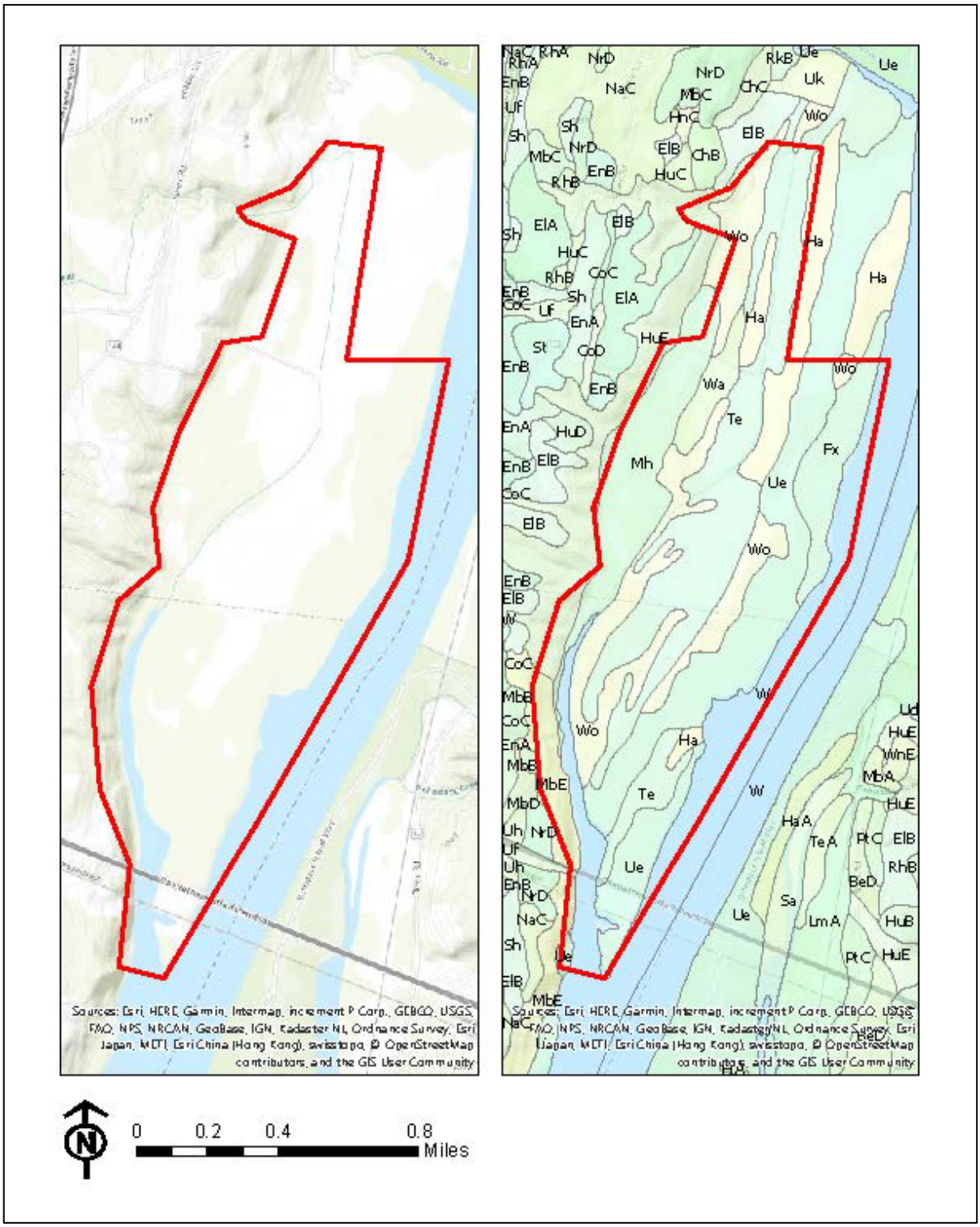


Figure 3: Binnen Kill Study Area

The Binnen Kill site is a well-studied area and the focus of several project initiatives. In 2017 the *Natural Resource Inventory and Assessment of Conservation Priorities of the Binnen Kill and its Tidal Habitats* was published by the New York State Department of Environmental Conservation (Miller et. al. 2017). The document included a cultural resources inventory and assessment of potential impacts. Much of the background information about the site was taken from that resource inventory.

Figure 4: Binnen Kill

Environmental Setting

The Binnen Kill site is located within the Hudson-Mohawk Lowlands physiographic region. The Hudson River flows from the southeastern Adirondacks, through a 15-20 mile wide lowland area, which is bounded by the Helderberg Plateau and the Catskill Mountains to the west, and the Taconic Mountains to the east. This section of the Hudson River Valley consists of a narrow inner valley with adjacent terraces approximately 100-200 feet high, bordered by gently rolling terrain and low hills. The valley is underlain by weak sedimentary rock, primarily formed during the Cambrian and Lower Ordovician periods (NYSDOT, 2013). Specifically, the site is mapped as the Austin Glen Formation, which consists of highly folded, interbedded greywacke sandstone and shale that formed in a deep marine setting from the erosion of pre-existing sedimentary rocks (NYS Museum, 1995). In general, the surficial geology of the region is heavily influenced by its history of glaciation, including glacial till and lacustrine sediment deposited during the most recent glacial advance and retreat 70,000 to 16,000 years ago. The Hudson River has since reworked these sediments, and the site is currently mapped as alluvium (NYS Museum, 1991). Additionally, the area has been influenced by dredging, and dredge spoils have filled in the areas between islands that historically existed at the site (Miller et. al., 2017).

As discussed above, the area of the Hudson River Valley consists of a low-lying inner valley, bordered by steep slopes to terraces 100-200 feet high. The site is located within the inner valley on a river terrace close in elevation to the Hudson River. Based on a 2011–2012 LiDAR dataset developed by the New York State Department of Environmental Conservation (NYSDEC), the topography of the site is generally low-lying and gently sloping, with the majority of the site sitting at an elevation of less than 8 feet (NYSDEC, 2011 - 2012). There is an overall slope from north to south, with the shoreline of the Hudson River and Binnen Kill at the lowest elevation, and the site is bounded on the western edge by a steeply sloping hillside. Mounds and berms are present in areas of dredged material placement.

Soils data and soils descriptions for the site were acquired from the National Resources Conservation Service (NRCS) Web Soil Survey for Albany County, New York. The majority of the site was mapped as one of six soils: Hamlin silt loam, Medihemists and Hydraquents, Teel silt loam, Udipsamments (dredged), Wakeland silt loam, and the Wayland soil complex (NRCS, Web Soil Survey).

Hamlin silt loam is a nearly level, very deep and well-drained soil found on floodplains along the Hudson River. It is formed from silty alluvium from areas of siltstone, shale and limestone. Typical depth to the

water table is 36-72 inches, and it is not considered hydric. The surface layer is typically dark brown silt loam, underlain by layers of dark grayish brown silt loam.

Medihemists and Hydraquents, ponded, are very poorly drained organic or mineral soils found in level areas and shallow ponds bordering lakes, ponds, or other water bodies. These soils are very poorly drained, with moderately high hydraulic conductivity, and are classified as hydric. Typical vegetation includes cattails, rushes, and other water-tolerant herbaceous species.

Teel silt loam soils are very deep, moderately well drained soils found on floodplains of major streams, formed from silty alluvium. The seasonal high water table for these soils is 18 to 24 inches from February to April, and is occasionally flooded from November to May. It is not classified as hydric.

Udipsamments, dredged, are made up of very deep, level areas of well drained sand and gravel, formed from soil material pumped from the Hudson River. Typically, sandy material containing up to 35% gravel is deposited in layers up to 10 feet thick on top of the original soil.

Wakeland silt loam is a very deep, somewhat poorly drained soil found on floodplains of streams in areas with stratified silts. The soil is formed from silty alluvium and is not classified as hydric. The seasonal water table is at a depth of 12-36 inches from January to April and is occasionally flooded from January to May. The depth to bedrock is greater than 60 inches.

Wayland soils complex is very deep and poorly drained and is found in depressions on floodplains along major streams. The seasonal water table is at a depth of 0-6 inches from November to June, and is frequently flooded for brief periods from November to June. The soils are formed from silty and clayey alluvium derived from interbedded sedimentary rock.

Literature Review and Known Cultural Resources within the Study Area

Evidence has been found of a Paleoindian presence in the Hudson Valley as nearby as West Albany (Ritchie 1994). Although archaeological sites from the Early and Middle Archaic periods are rare in the region they do exist as evidenced by sites in Ulster County, Connecticut and the Upper Delaware Valley (Funk 1976, 1991). Sites from the Late Archaic and Woodland periods are much more common in the northeast and regionally as populations increased and subsistence strategies diversified.

Of the 30 archaeological sites documented within 1 mile of the study area, twelve are precontact and three have been dated to the Woodland Period, the remainder lacked temporal data. A village, quarry, workshops and burials are among the precontact site types within a 1 mile radius of the study area. One site (00102.000198) about which little is known is located within the northern portion of the study area. The remaining sites are located outside the boundaries of the study area. There is a precontact burial site, the Bethlehem Ancestral Repatriation Site (00102.000892), just north of the study area boundary, which was identified in the vicinity of a historic cemetery dating to the eighteenth and nineteenth centuries and the historic Nicoll-Sill or Bethlehem House (Hargen 2016). One site (08313.000238), identified as a Mahican Indian Village, was depicted on a 1730 deed map on the east side of the Hudson River. Sites 08313.000293 and 08343.000059 have been determined NRHP eligible. In addition, there is an NRHP eligible Schodack Landing Precontact Archaeological District (08313.000319) approximately 0.6 miles from the study area. The prehistoric district consists of 20 contributing precontact archaeological sites situated on terraces between waterways draining into Schodack Creek and the Hudson River.

European settlement of the region began when the Dutch established Fort Orange in 1614 near present-day Albany, approximately 5 miles north of the study area. By the late 1600s Albany was growing into an urban center while much of the surrounding region developed into active farmland. Other hamlets, villages, and urban centers developed nearby over the next few centuries however much of the region has remained largely rural, consisting of both nucleated and diffuse residential and commercial areas surrounded by mixed forest and agricultural land (Miller et. al. 2017).

Historic maps indicate that the Binnen Kill study area has remained largely undeveloped through most of its history. The Natural Resource Inventory prepared in 2017 included a review of historic maps depicting the historic shoreline and early use of the study area. The earliest development of the site is depicted on a Beers map dated 1891 (Figure 4). Two ice houses (Bakers Ice House and 'Friendship' Ice House) are depicted along the shoreline. Poplar, Schermerhorn, and portions of Shad islands are also depicted with other ice house structures. A cemetery is located near the north end of the project area, with houses attributed to A. Baker and the J. Vanderpool Est. just outside of the Study Area. A map from

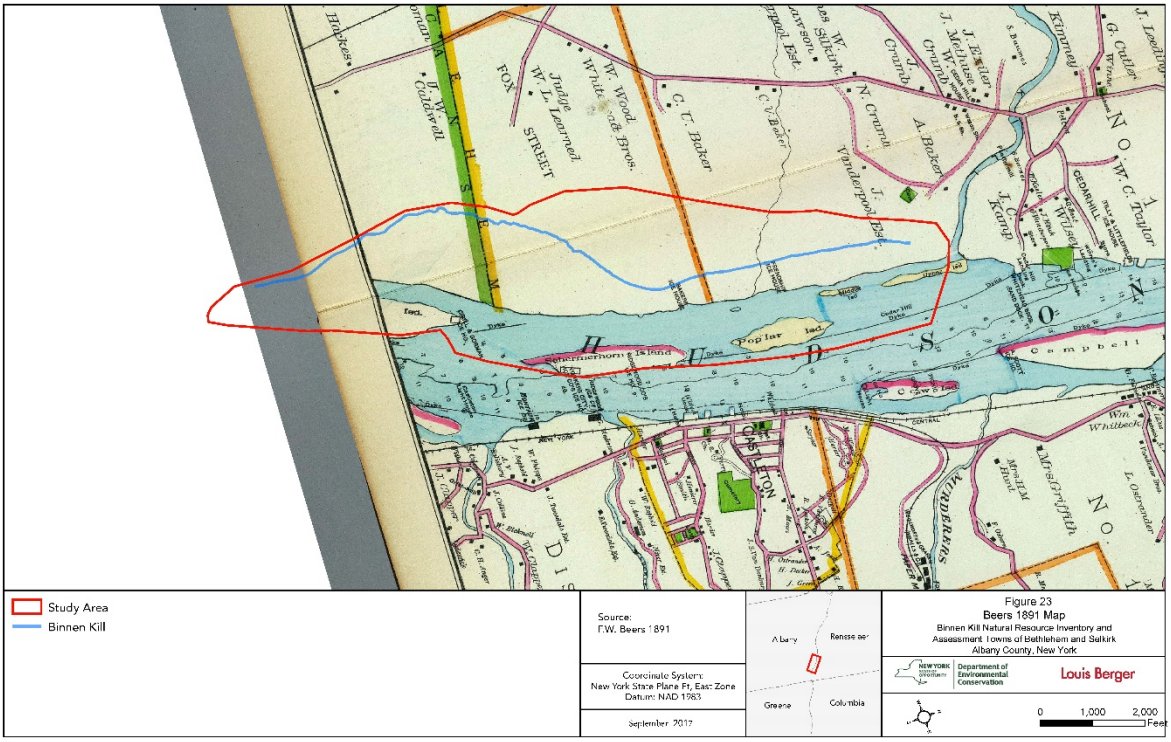


Figure 5: 1891 Map of the Binnen Kill Study Area (Taken from Miller et al. 2017)

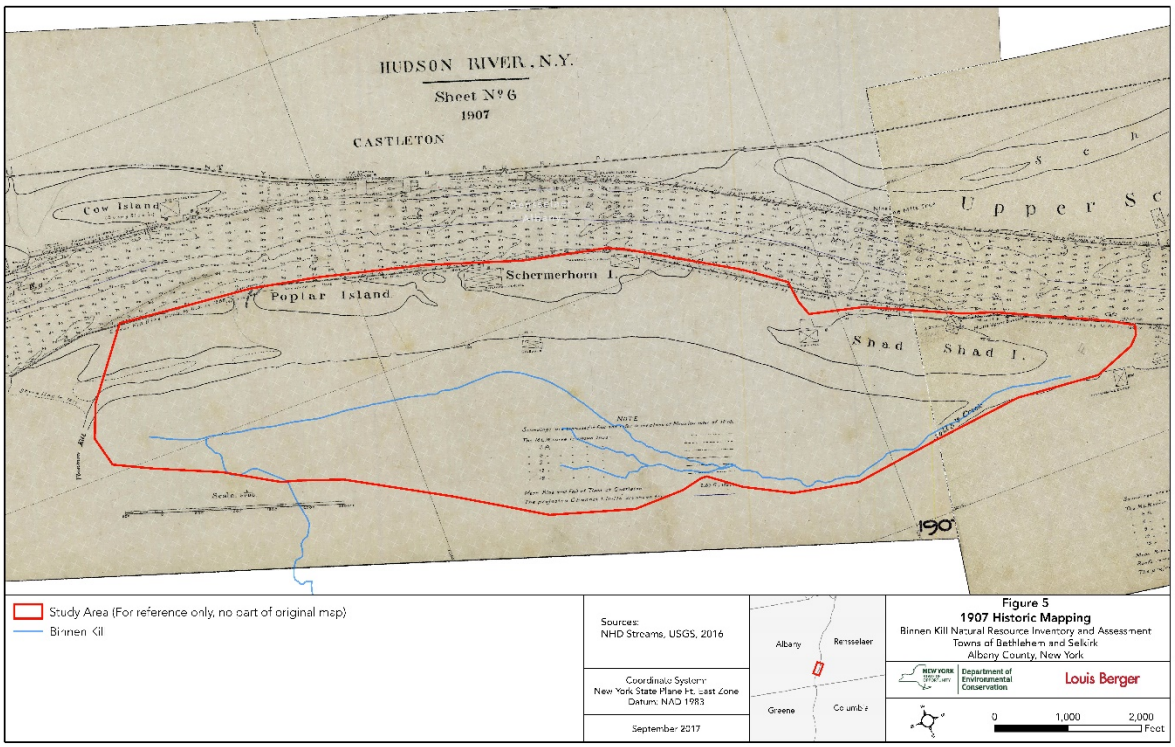


Figure 6: 1907 Map of the Binnen Kill Study Area (Taken from Miller et al. 2017)

1907 also depicts Shad, Schermerhorn and Poplar islands with several ice houses and other structures still extant. Baker's ice house is still portrayed, but the 'Friendship' ice house is not (Figure 6).

There are 18 previously recorded historic archaeological sites within 1-mile of the current Binnen Kill APE. Nine sites were reported by OPRHP in 1997 following a historical and cultural resources survey of Castleton Island State Park. All consist of historic sites that were identified using archival and historic map sources. The locations of two of these sites (08313.000237/Ziegler's Ice House and 08313.000251/Unidentified Historic Site) were verified by locating surface remains during a pedestrian reconnaissance. Another notable site in the vicinity is the National Register of Historic Places (NRHP) eligible Castleton Landing Site (08343.000058).

The Schodack Landing Historic Archaeological District (08313.000320) is comprised of 25 contributing historic sites distributed along portions of NY Route 9J and its connecting roads and is approximately 0.8 miles southeast of the current study area on the opposite side of the Hudson River. The sites represent occupations ranging from the late eighteenth century through the nineteenth century.

The CRIS online database lists 167 previously inventoried historic properties within 1-mile of the study area. The majority of these recorded properties are located on the east side of the Hudson in Castleton and Schodack and consist of nineteenth-century structures. The NRHP eligibility status of most of these properties remains undetermined. One of these properties (08313.000126) is listed on the National Register and consists of a ca. 1854 house located on River Road in Schodack. Several other properties have been recommended as eligible but have not been formally NRHP listed.

A total of 32 historic properties have been recorded within 1 mile of the study area on the west side of the Hudson River in the towns of Bethlehem and Coeymans. Three of these properties have been listed on the National Register. The Nicoll-Sill or Bethlehem House (00102.000004), is located just north of the study area. This historic property consists of a large brick Dutch-Colonial farmhouse constructed in the early-to-mid- eighteenth century. An associated cemetery is located on the opposite side of the street from the house, just outside the project study area. Other listed properties in the project vicinity include a mid-nineteenth-century school house (00102.000001/Cedar Hill Schoolhouse) north of the project area, and a ca. 1825 house and associated cemetery (00103.000304/Mull House and Cemetery) located south of the study area. Nine other historic resources in the vicinity have been determined NRHP eligible but not been formally listed. One of these eligible resources is the ca. 1958 Castleton-on-Hudson Bridge (08313.000338) which crosses the southern portion of the study area.

The archaeological survey conducted as part of the Binnen Kill Natural Resource Inventory consisted of pedestrian reconnaissance/walkover survey of the proposed 'Focus Area' where potential conservation and habitat management efforts were anticipated (Figure 7) (Miller et. al. 2017). Only about sixty percent of the study area was covered by the walkover survey due to right of entry constraints. The purpose of the pedestrian survey was to identify locations with potentially intact, undisturbed soils in areas where map-documented historic resources were identified, or locations that may have been favorable for prehistoric human habitation.

The pedestrian survey identified the foundation ruins of a single historic site in the central portion of the study area along the former 1890s shoreline, the remains of the Baker's Ice House. A segment of a historic road was also identified just south of this location, between the former shoreline and Binnen Kill, and may have been associated with historic use of the ice house. An un-maintained and unimproved gravel and crushed brick farm road with a deteriorated steel-framed bridge over the Binnen Kill was also identified bisecting the southern portion of the study area.

The portion of the study area east of the map-documented 1890s shoreline was assessed as having no potential for intact prehistoric resources since the soils were deposited sometime after 1890. Areas of the study area west of the historic shoreline with slightly elevated, dry soils were considered to have a moderate to high probability for containing intact prehistoric archaeological resources and several areas were identified during the reconnaissance survey as sensitive. These consist of a small area of mixed meadow and woodland in the southern portion, as well as two meadows flanking the Binnen Kill in the central portion of the study area containing the remains of the ice house and the historic road segment.

Recommendations

The recommended plan for the Binnen Kill Site is Alternative 4 in the north and Alternative 2 in the south (see Appendix A). A review of existing information suggests that portions of the project area are considered to have a moderate to high probability for prehistoric and historic archaeological resources due to the presence of previously recorded prehistoric sites on similar landforms in the project vicinity, as well as several nineteenth-century map-documented structures in the vicinity of the APE. The remains of a nineteenth century ice house has been identified within the Area of Potential Effect (APE) for the proposed restoration measures and a prehistoric site is located within 100 feet of the APE at the northern end. Additional cultural resources surveys are recommended to address areas not previously investigated and to fully determine the presence or absence of historic properties and archaeological sites within the APE. Geotechnical investigations will be useful in confirming the depth of dredge

material and the potential for deeply buried prehistoric archaeological sites to exist within the APE. As plans are further developed additional areas may be considered for staging and access roads and should be assessed for cultural resources.

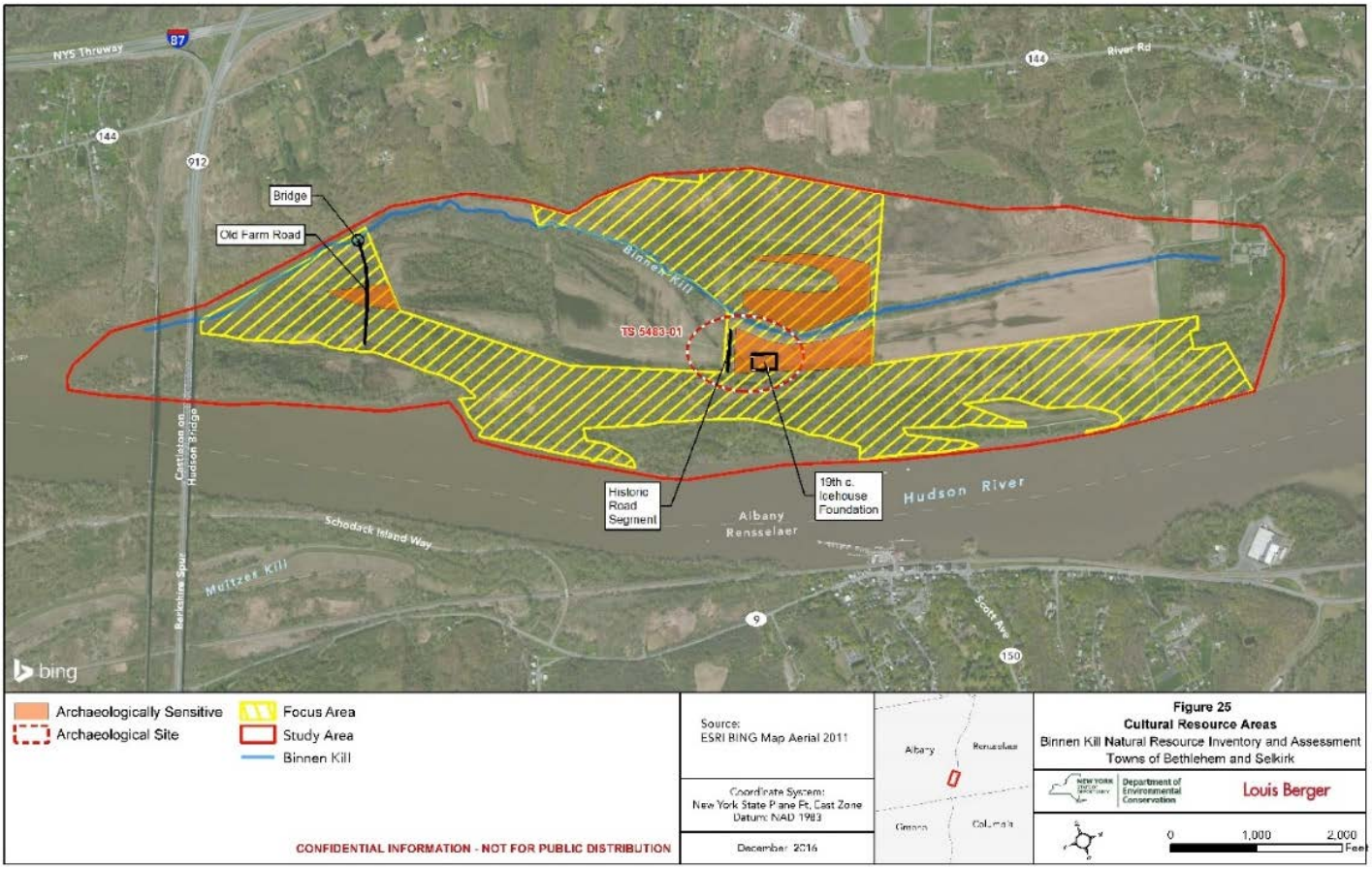


Figure 7: Map of Cultural Resources within the Binnen Kill Study Area (Taken from Miller et. al. 2017)

Schodack Island State Park

Project Description

Schodack Island State Park sits off the eastern shore of the Hudson River approximately 10 miles south of Albany, New York. The park is located in the Town of Schodack, Rensselaer County, the Town of New Baltimore, Columbia County, and the Town of Stuyvesant, Greene County. The restoration site where proposed actions would be implemented, is limited to an approximately 400 foot wide corridor within Schodack Island State Park between the Hudson River and Schodack Creek, just south of the park's boat launch parking area. The restoration site is entirely within the Town of Schodack, Rensselaer County portion of Schodack Island State Park (Figure 8).

Prior to the 20th century, the area that would become the park originally consisted of Upper Schodack Island, Lower Schodack Island, and Houghtailing Island, as well as several smaller islands. The area

known as Schodack Creek along the east side of the islands was in fact a branch of the Hudson River. The Muitzes Kill flowed from the east into the Hudson at the northern end of Upper Schodack Island, where Schodack Creek split off from the main flow of the Hudson River.

Beginning in the late 19th to early 20th century, dikes were constructed along the western edge of the islands (Friends of Schodack Island State Park, 2018). Dredging of the Hudson River deepwater channel began in the 1920s. Dredge spoils placed in the area caused the original islands to merge into a single landmass of approximately 2,000 acres (NYSDOS, 2012). This peninsula is connected to the eastern shore of the Hudson River at its upstream end and extends approximately seven miles downstream. Schodack Creek, along the east side of the peninsula, no longer has an upstream connection to the Hudson River. It is now fed by the Muitzes Kill as well as several small streams along the eastern shore, before joining the Hudson River at the downstream end of the peninsula.

The peninsula is now primarily occupied by Schodack Island State Park, including a boat launch, campground, and network of unpaved roads and trails. The south end, on what was originally Houghtailing Island, is occupied by a United States Army Corps of Engineers (USACE) dredge spoil disposal site in active use (USACE, 2014). The northern end of the Park is crossed by a railroad bridge and a highway bridge for Route 912M, both spanning the Hudson River. A set of railroad tracks are adjacent to the east side of Schodack Creek.

What was to become Schodack Island State Park was first acquired by the New York State Office of Parks, Recreation and Historic Preservation in the 1970s, and was originally known as Castleton Island State Park. It remained undeveloped until the early 2000s (Huey *et al.,* 1997). Schodack Island State Park was opened in 2002 and was initially a day-use only park. Prior to its designation as a State Park, Schodack Island was relatively inaccessible (National Audubon Society, 2018).

Currently, eight miles of multi-use trails wind through a variety of ecological communities. In addition, the park has 66 campsites for use, an improved bike trail, volleyball nets, horseshoe and a kayak/canoe launch site. Interpretive signage highlights the park's historic and environmental significance. Many recreation events are hosted at the Schodack Island State Park, including a Winterfest with cross country ski racing, snow shoeing, nature hikes, ice skating, and dog sledding (Schodack Scene, 2015).

In addition to being a state park, Schodack Island has also been designated a State Estuary. As noted previously, a portion of the park shelters a BCA that is home to Bald Eagle and Cerulean Warbler, and Great Blue Heron rookery. Osprey also roost and forage in the BCA. The western side of the Island, along the Hudson River shoreline, is predominately floodplain forest, and is of particular importance in regard to its use by Bald Eagles. These species, and others noted above, draw bird watchers to the island.

The site is located within a designated Scenic Area of Statewide Significance (SASS), specifically the Columbia-Greene North SASS, in the CGN-4 Islands subunit (NYSDOS, 1995). According to the Scenic Area Study associated with this SASS (NYSDOS, 1995), the Islands subunit is included in the Columbia-Greene North SASS because "...it links distinctive subunits. The subunit constitutes the middle ground and background of views to the Hudson River from distinctive subunits on both the west and east banks of the Hudson, including views from the trains on the eastern shore and from NY Routes 61 and 9J…"

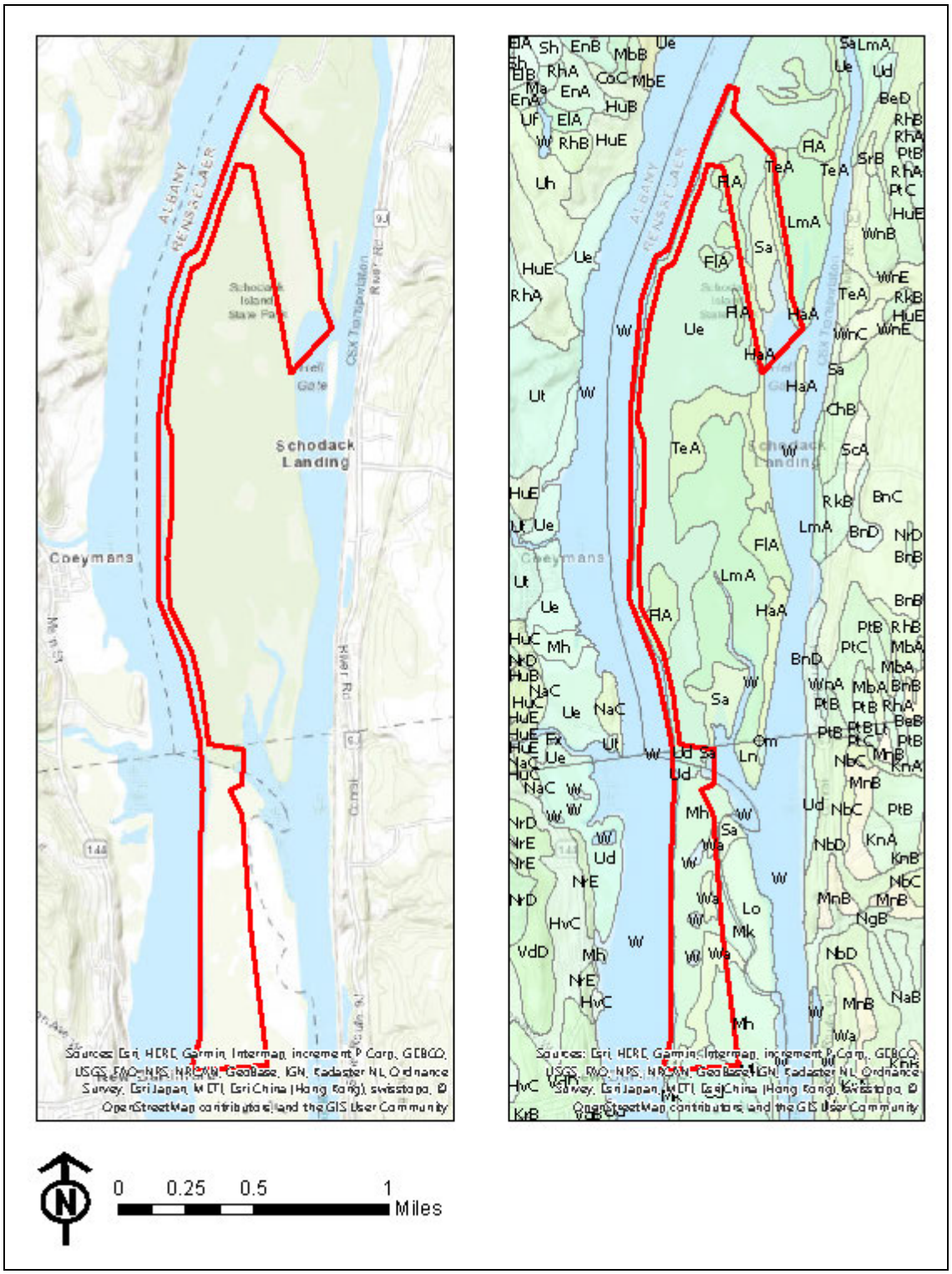


Figure 8: Schodack Island State Park Study Area

Six alternatives were developed as part of this project; two alternatives for the north component, two alternatives for the south component, and one alternative for the pocket wetland component. The alternatives consisted of varying combinations and scales of measures including wetland restoration involving tidal wetland restoration and creation of side channel connections and a riparian corridor with culverts and road crossings. The Tentatively Selected Plan consists of restoration of approximately 20 acres of existing tidal habitat and creation of a side channel. A side channel would be excavated in areas of historic fill placement to hydrologically connect Schodack Creek and the Hudson River with tidal waters. The channel would convey flow during low tide and higher water levels providing refuge to aquatic species during increased river velocities. A 400-foot tidal wetland corridor would be established adjacent to the channel. To accommodate local vehicular access to the southern portion of the island, the channel would be spanned by a road crossing with rectangular reinforced box culverts. The existing ski trail would also be redirected to this road crossing.

Figure 9: Schodack Island State Park

Environmental Setting

The study area is within the Hudson-Mohawk Lowlands physiographic region. The Hudson River flows from the southeastern Adirondacks, through a 15-20 mile wide lowland area, which is bounded by the Helderberg Plateau and the Catskill Mountains to the west, and the Taconic Mountains to the east. This section of the Hudson River Valley consists of a narrow inner valley with adjacent terraces approximately 100-200 feet high, bordered by gently rolling terrain and low hills. The valley is underlain by weak sedimentary rock, primarily formed during the Cambrian and Lower Ordovician periods (NYS DOT, 2013). Specifically, the Schodack Island site is mapped as the Normanskill Formation, which characterized as dark green to black argillaceous shale containing calcareous and chert beds (Laberge Group, 2011). Post-deposition, the Normanskill shale was folded into a series of hills and valleys trending north-south (NYSDOS, 1995). In general, the surficial geology of the region is heavily influenced by its history of glaciation, including glacial till and lacustrine sediment deposited during the most recent glacial advance and retreat 70,000 to 16,000 years ago. The Hudson River has since reworked these sediments, and the site is currently mapped as alluvium (NYS Museum, 1991). Additionally, the area has been influenced by dredging, and deposited dredged material have filled in the areas between islands that historically existed at the site (Friends of Schodack Island State Park, 2018).

As discussed above, the area of the Hudson River Valley consists of a low-lying inner valley, bordered by steep slopes to terraces 100-200 feet high. The site is located within the inner valley on a peninsula that was previously multiple islands formed from alluvium. Based on a 2011–2012 LiDAR (Light Detection and Ranging) dataset developed by the New York State Department of Environmental Conservation (NYSDEC), the topography of the site is generally low-lying, with the highest elevations on the western

edge reaching 22 feet. Portions of the dredge disposal area at the south end of the site reach as high as 50 feet (Figure 10) (NYSDEC, 2011 - 2012).

Soils data and soils descriptions for Schodack Island Park were acquired from the National Resources Conservation Service (NRCS) Web Soil Survey for Rensselaer, Columbia, and Greene Counties, New York. The majority of the Park was mapped as one of eight soils: Udorthents (sandy), Limerick silt loam, Udipsamments (dredged), Medisaprists-Hydraquents (tidal marsh), Fluvaquents-Udifluvents complex, Saprists and Aquents (ponded), Middlebury silt loam, and Hamlin silt loam (NRCS, Web Soil Survey).

Udorthents, sandy, are composed of very gravelly loamy sand, typically dredged from the Hudson River. These soils are deep, excessively drained, with very high hydraulic conductivity.

Limerick silt loam soils are found in depressions on floodplains and are composed of silt loam derived from alluvium that is dominantly silt and very fine sand. These soils are deep, poorly drained, and rated as hydric.

Udipsamments, dredged, are made up of very deep, level areas of well drained sand and gravel, formed from soil material pumped from the Hudson River. Typically, sandy material containing up to 35% gravel is deposited in layers up to 10 feet thick on top of the original soil.

Medisaprists-Hydraquents, tidal marsh, are a complex of organic Medisaprists composed of deep layers of organic muck over silt loam and mineral Hydraquents, which are made up of silty clay loam over silt loam. They are both found in flat areas in marshes, are rated as hydric, and are very poorly drained.

Fluvaquents-Udifluvents complex soils are found in flat areas on floodplains. Fluvaquents are formed from silt loam over gravelly silt loam, located in low areas that flood frequently. They are poorly drained and rated as hydric. Udifluvents are found in slightly higher areas and are composed of gravelly fine sandy loam over gravelly sandy loam. They are moderately well drained, with a typical depth to water of 36-72 inches, and are not rated as hydric. Both are formed from alluvium with a highly variable texture and have variable profiles.

Saprists and Aquents, ponded, are a complex of organic Saprists composed of deep layers of organic muck over fine sandy loam and mineral Aquents, which are made up of mucky silt loam over gravelly loamy sand. They are both found in flat areas in swamps and marshes, are rated as hydric, and are very poorly drained.

Middlebury silt loam is a moderately well drained soil found on flat floodplains, and it is composed of silt loam, sandy loam, and gravelly fine sand. This soil is derived from loamy alluvium predominantly from areas of shale and sandstone with some lime-bearing material. It is not rated as hydric.

Hamlin silt loam is a nearly level, very deep and well drained soil found on floodplains along the Hudson River. It is formed from silty alluvium from areas of siltstone, shale, and limestone. Typical depth to the water table is 36-72 inches, and it is not considered hydric. The surface layer is typically dark brown silt loam, underlain by layers of dark grayish brown silt loam.

Literature Review and Cultural Resources within the Study Area

Several cultural resources surveys have been conducted within the study area. Much of the historical background for Upper and Lower Schodack Island was compiled by Paul Huey of the New York State Office of Parks, Recreation and Historic Preservation (Huey 1997). In the 1990s Wendy Harris and Arnold

Pickman of the U.S. Army Corps of Engineers conducted surveys to locate historic ice houses on the Schodack Islands as part of the Hudson River Habitat Restoration Study (Harris and Pickman 1997 and 2000) and Hartgen Archaeological Associates (HAA) was retained by the NYSOPRHP between 1997 and 2002 to conduct a series of archaeological investigations in areas of construction for park facilities and mitigation areas that were considered to be sensitive for prehistoric and historic resources (HAA 1999, 2000, 2001a, and 2002a). These studies have formed the basis for this cultural resources assessment.

The archaeological record of the area surrounding Schodack Island is similar to that of Binnen Kill. Of the 97 archaeological sites documented within 1 mile of the study area 28 are prehistoric and 20 of the prehistoric sites have been determined eligible for the NRHP. The Schodack Landing Prehistoric Archaeological District (08313.000319) is situated on the east side of the Muitzes Kill and consists of 20 contributing precontact archaeological sites situated on terraces between waterways draining into Schodack Creek and the Hudson River. The Mahican Indian Village Site (08313.000238), is documented on historic maps within the Schodack Island study area however the village location has not been confirmed through archaeological investigations. In 1999 archaeological testing of a potential mitigation site on the eastern shore of Lower Schodack Island uncovered Native American pottery, chert flakes, cracked rock fragments and other items that likely date to the Middle Woodland Period (HAA 1999).

In 1609, when Henry Hudson explored the Hudson River he recorded the island of Schodack. One of the earliest settlements in the area was the Colonie of Rensselaerwyck to the north in 1630. Historic records document the presence of the Mahican people on the Schodack Islands in the sseventeenth century and they are believed to have utilized the Islands in precontact periods. In the seventeenth century ownership of the Islands passed into the hands of the Dutch, but Native Americans were still residing on Lower Schodack Island until the middle of the 18th century. Where the Muitzeskill enters Schodack Creek was the location of a large Indian settlement and a river landing owned and operated by the Dutch in the 17th Century called Schutters Island. The Schodack Islands possessed rich farmlands and a convenient location to store and raise cattle and as a result many farms were established in the 17th Century on the Islands. Numerous ice harvesting companies established commercial storehouses on the Schodack Islands beginning in the late 1700s but by 1930 all the ice houses had closed. Starting from 1863 the Federal Government began construction of dikes and a deep channel in the Hudson River and between 1920 and 1998 Hudson River dredge spoil was deposited on top of the islands and in the channels between the Lower and Upper Schodack Islands and between the Lower Schodack and Houghtailing Island, Mull Island, and Mull's Platt.

Four historic sites are located within the boundaries of the study area. These are the Miller and Witbeck Ice House (08313.000242), Ziegler's Ice House (08313.000237), the J.N. Briggs Ice House (08313.000243), and the Horton and Company Ice House (03912.000109). Several other archaeological sites have been identified on Upper and Lower Schodack Island, these are the P. McCabe & Co. Ice House (03912.000112), the Scott Brothers Ice House (03912.000111), the Vanderpoel, Van Orden & Sherman Ice House (03912.000113), the McCabe or Vanderpoel, VanOrden & Sherman Ice House (03912.000108), the Gardenier Ice House or National Ice Company Ice House (02117.000100), the Shermerhorn & Gardenier Ice House (02117.000101), the Johnson House Site (08313.000247), the Knickerbocker Ice House (08313.0000248), an unidentified Ice House Structure (08313.000236), the Van Buren Farm (08313.000246), a group of barge wrecks (08313.000245), the Witbeck/Schermerhorn Farm Site (08313.000234), the Douw/Gardenier Farm Site (08313.000235), the Calverway (08313.000254), the Ten Eyck House Site and Vicinity (08313.000255), Clifford's Ice House (08313.000256), Dodd &

Maloney Ice Hosue Site (08313.000253), and the Montauk Ice House Site (08313.000252). The remaining sites within 1 mile of the study area are located outside the study area boundaries either to the east of Muitzes Kill on the mainland or across the River to the west. The National Register of Historic Places (NRHP) eligible Schodack Landing Historic Archaeological District (08313.000320) is comprised of 25 contributing historic sites distributed along portions of NY Route 9J and its connecting roadseast of the Muitzes Kill. The sites represent occupations ranging from the late eighteenth century through the nineteenth century.

Background research using the CRIS online database identified 236 previously inventoried historic properties within 1-mile of the study area however none of those properties are located within the current study area. The majority of the recorded properties are concentrated on the west side of the Hudson River within the Coeymans Landing Historic District (17NR00042) and on the east side of the Hudson in Schodack and consist of various nineteenth-century structures contributing to the Schodack Landing Historic District (90NR00967). The majority of these properties are listed on the NRHP. The NRHP eligible Castleton-On-Hudson Bridge (08313.000338) and the Alfred H. Smith Memorial Bridge (08313.000358) and are located approximately 0.5 miles north of the study area.

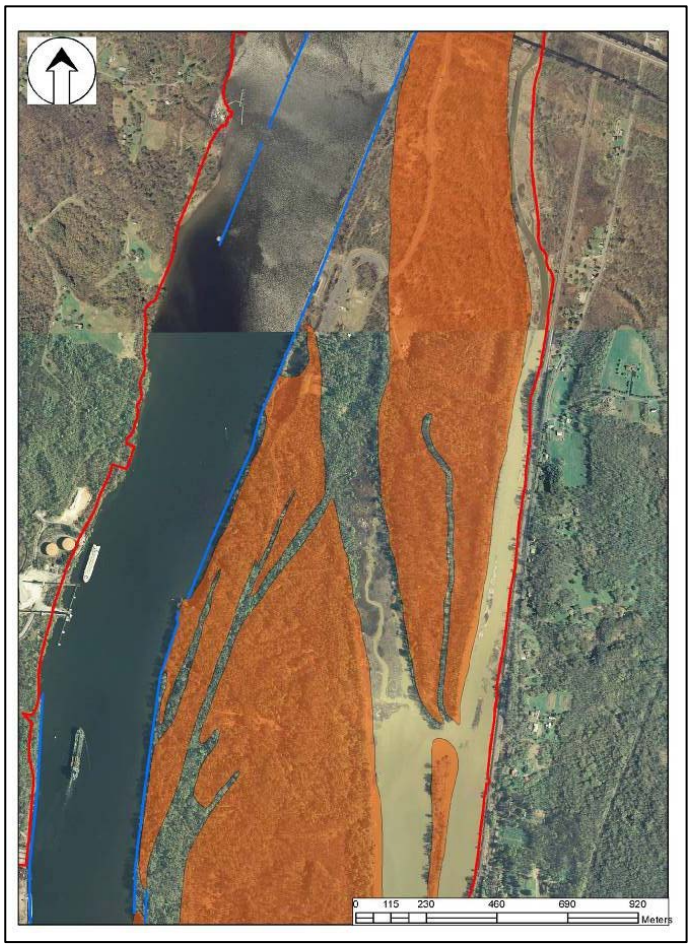


Figure 10: Historic Islands at Schodack

Recommendations

The tentatively selected plan for the Schodack Island State Park Site is comprised of Alternative 2 in the northern portion. No measures are recommended for the southern portion of the site. In 2015 the New York State Department for Environmental Conservation prepared a document entitled *Program Statement for the Creation of Backwater Channel and Shallow Water Habitat Restoration at Schodack Island State Park* which evaluated the feasibility of re-creating backwater channels at three sites in the Park. The report included a cultural resources inventory and sensitivity assessment for the proposed measures. Combining data collected from previous surveys and the NYSOPRHP CRIS online service, a map was prepared depicting the location of documented resources and historic shorelines (Cheplowitz 2015) (Figure 11).

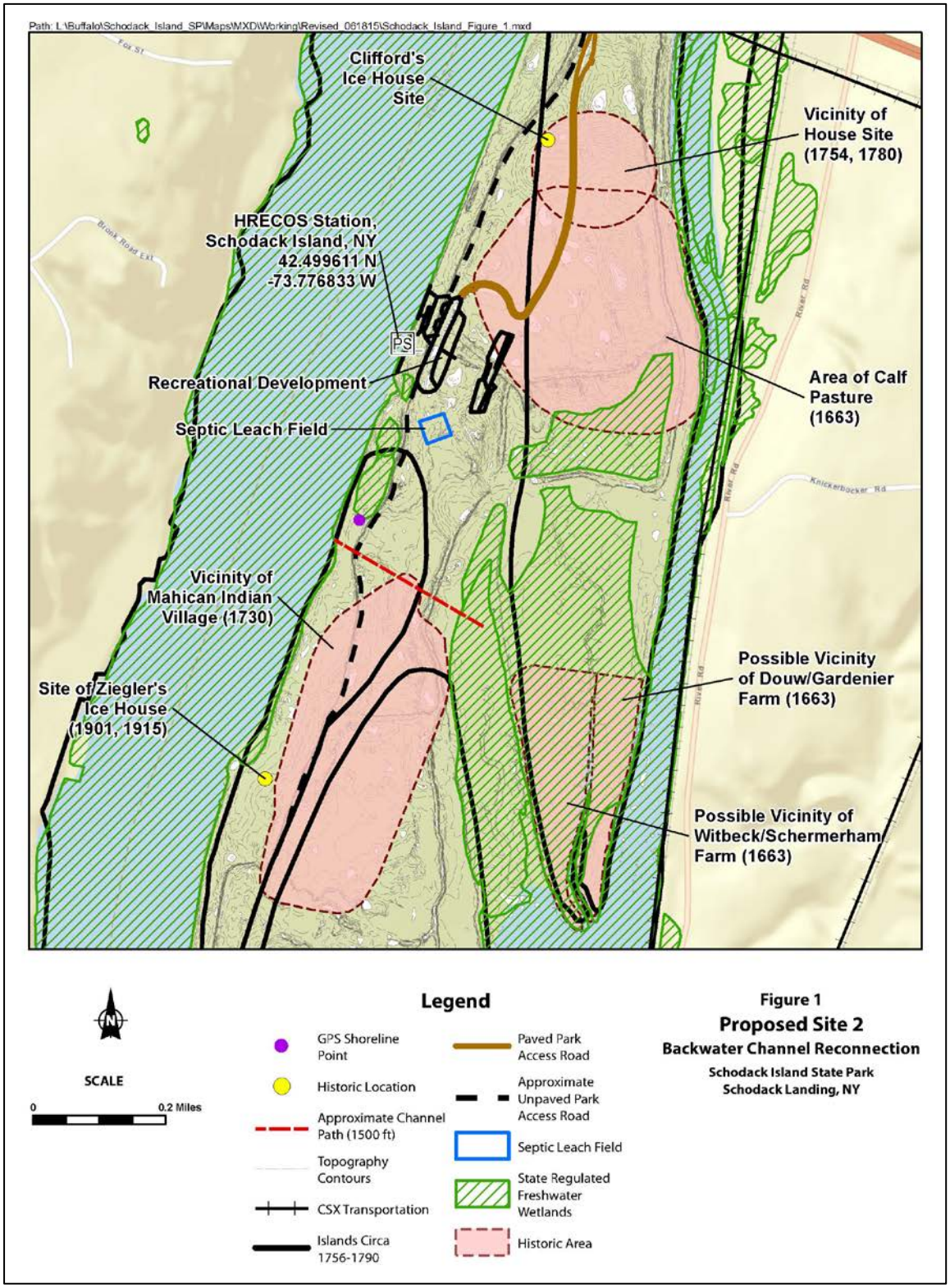


Figure 11: Map of Cultural Resources in the Schodack Island Study Area (Taken from Cheplowitz 2015)

Of the five sites identified within the study area only one is located within the APE of the recommended plan, the Mahican Indian Village. The proposed measures are primarily located within the historic channel that once divided the Islands and archaeological testing within a portion of the APE in 1999 confirmed that the area contains fill deposits however the maximum depth of those deposits has not been determined (HAA 1999). A review of previous surveys and other background data indicates that the potential for prehistoric and historic archaeological sites to exist within most of the APE is low however, there is a portion of the APE that may not have been inundated historically according to historic maps and this portion of the APE has also been identified as the potential site of the Mahican village. Geotechnical surveys of the APE will be helpful in determining the potential for the proposed project to reach depths below dredge material deposits and additional surveys including limited subsurface testing is recommended once plans are further developed to determine the presence or absence of archaeological sites within the APE. Additional areas identified for staging and access should also be evaluated for impacts to cultural resources.

Henry Hudson Park

Project Description

Henry Hudson Park is a public open space located on a 64.2-acre property on the west shore of the Hudson River, owned by the Town of Bethlehem, Albany County, New York (Figure 12). The park serves as the only public access location to the Hudson River within the Town of Bethlehem. Lyons Road traverses the park connecting it to other local residential roads and to NY Route 144 - River Road. The park is bound to the east by the Hudson River, and Vloman Kill traverses the southern portion of the park draining to the Hudson River. The area of the park to the south of Vloman Kill is inaccessible by foot from the main area of the park. The Henry Hudson Park shoreline is approximately 2,680 feet in length and approximately 600 feet from the Hudson River's main navigation channel (Ocean and Coastal Consultants, 2011). The Henry Hudson Park Restoration Site is located a short distance north of the Binnen Kill Restoration Site.

Approximately 15 acres of the park is managed as recreational open space, including parking areas, a pavilion, boat launches for motorized craft, kayaks, canoes and other hand-powered craft, picnic areas, a softball field, a playground, a volleyball court, and a floating fishing platform. The remaining area is primarily undisturbed, including upland forest and vegetated areas adjacent to Vloman Kill. The recreational area of the park is located immediately adjacent to Lyons Road in the area between Lyons Road and the Hudson River. This area is relatively flat, ranging in elevation from approximately 7 to 9 feet (NAVD88), and is primarily turf with large shade trees interspersed.

In general, this reach of the Hudson River is characterized by narrow widths, extensive shoals, and a relatively steep river bottom resulting in higher water velocities. The channel has been highly modified due to dredging of the deepwater navigational channel in the 19th and 20th centuries. Shorelines have also been modified from dredged sediment disposal as well as rock and timber cribs used to contain dredge spoils (Allen et al., 2006). At Henry Hudson Park, the shoreline was built up beginning in the 1860's from dredged materials that were placed and contained through the use of timber cribs containing riprap stone. Based on historic topographic surveys, the site was underwater until 1925, when the navigation channel was dredged to a depth of 27 feet, later deepened to 32 feet in 1954 (Ocean and Coastal Consultants, 2011).

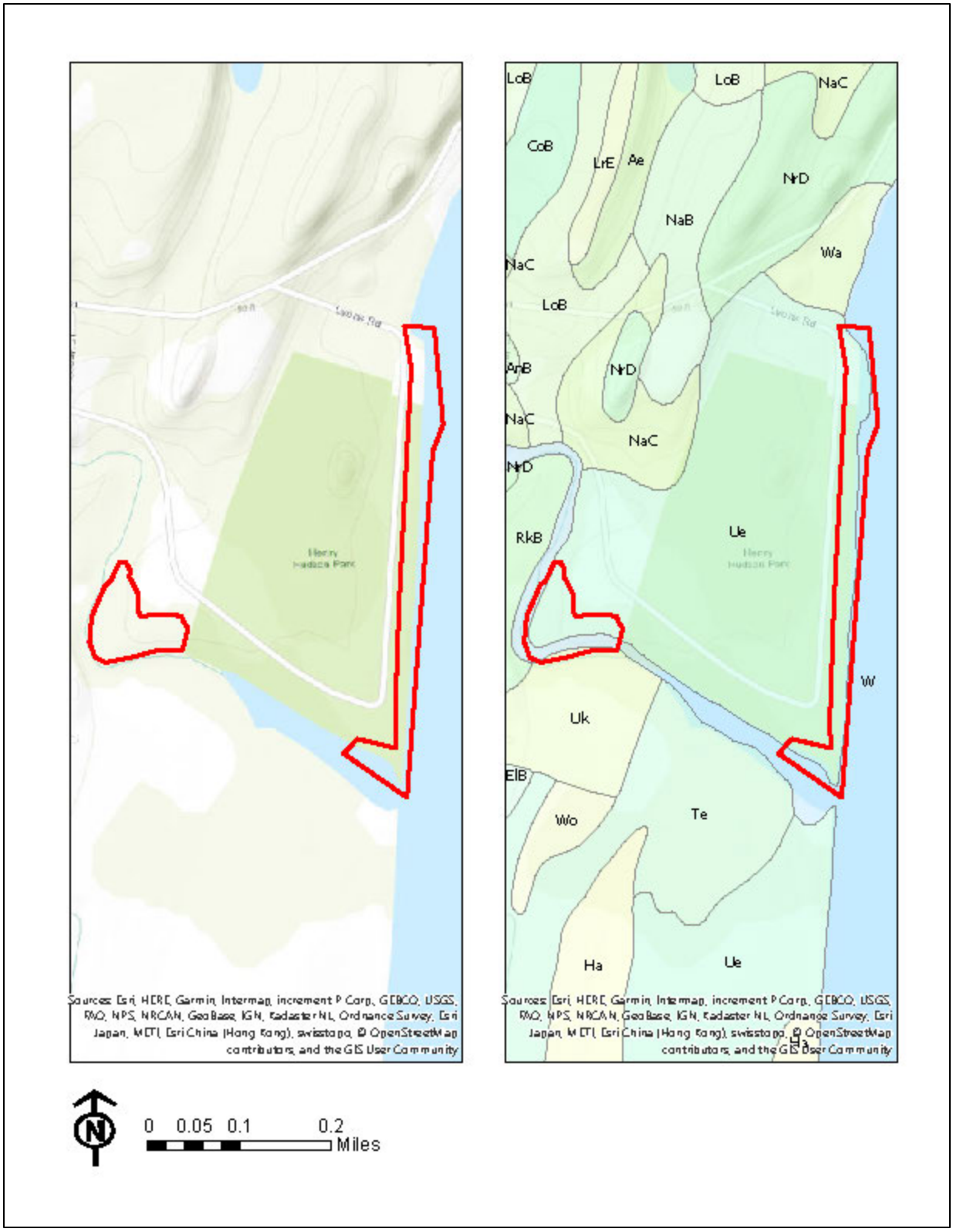


Figure 12: Henry Hudson Park Study Area

The park's shorelines vary in condition. The northern section of the Hudson River shoreline is lined with riprap. The riprap in this section is in good condition and no significant signs of erosion are present. This section also contains a boat ramp which, based on historic aerial imagery, was constructed between 1994 and 2004. The southern section of the Hudson River shoreline consists of a dilapidated timber cribbing structure built in the 1920s, filled with riprap between two timber crib walls, and capped with convex concrete segments. The majority of the structure has either partially or completely failed (Figure 13). The crib walls are severely decomposed, the concrete cap has detached and displaced, and riprap has moved from between the crib walls into the river. In sections of complete structural failure, upland areas show signs of erosion and are inundated during high tides. The cribbing structure extends southward and terminates along the mouth of Vloman Kill, sheltering a small cove. This cove contains an unvegetated, tidal mudflat area showing signs of erosion.

The restoration site where proposed actions would be implemented, is limited to the Park's Hudson River shoreline area, and a 3.5-acre riparian area on the river left side of Vloman Kill approximately 1,900 feet upstream from its confluence with the Hudson River. Two alternatives were developed and advanced for Henry Hudson Park (See Appendix A). Each alternative proposed modifications to the entire length of the existing shoreline structure. Alternative 1 is a *Hard engineering* approach and would impact a smaller footprint than Alternative 2. Alternative 1 consists of retaining the concrete cribbing present at the site but removal of the concrete cap along the Hudson River shoreline and placement of riprap and native vegetation in its place as well as installation of a coir log toe protection at the northern tip of the Vloman Kill and creation of a 3.6 acre tidal wetland upstream along the Vloman Kill. Alternative 2 consisted of complete removal of the timber cribbing and concrete cap along the Hudson River and replacing it with a concrete cribbing structure which would have gaps to allow for movement of water and aquatic organisms within the structure. Approximately 2 acres of tidal wetland would be created behind the cribbing along the Hudson shoreline and a 3.59 acre wetland would be created along the Vloman Kill. Alternative 1 is the Tentatively Selected Plan.

Environmental Setting

The Henry Hudson Park site is located within the Hudson-Mohawk Lowlands physiographic region. The Hudson River flows from the southeastern Adirondacks, through a 15- to 20-mile-wide lowland area, which is bounded by the Helderberg Plateau and the Catskill Mountains to the west, and the Taconic Mountains to the east. This section of the Hudson River Valley consists of a narrow inner valley with adjacent terraces approximately 100-200 feet high, bordered by gently rolling terrain and low hills (NYSDOT, 2013). The valley is underlain by weak sedimentary rock, primarily formed during the Cambrian and Lower Ordovician periods. Specifically, the Binnen Kill site is mapped as underlain by the Austin Glen Formation, which consists of highly folded, interbedded greywacke sandstone and shale that formed in a deep marine setting from the erosion of pre-existing sedimentary rocks (NYS Museum, 1995). In general, the surficial geology of the

Figure 13: Henry Hudson Park

region is heavily influenced by its history of glaciation, including glacial till and lacustrine sediment deposited during the most recent glacial advance and retreat 70,000 to 16,000 years ago. The Hudson River has since reworked these sediments, and the site is currently mapped as alluvium (NYS Museum, 1991).

As discussed above, the area of the Hudson River Valley consists of a low-lying inner valley, bordered by steep slopes to terraces 100-200 feet high. The site is located within the inner valley on a river terrace close in elevation to the Hudson River. Based on a 2011–2012 LiDAR (Light Detection and Ranging) dataset developed by the New York State Department of Environmental Conservation (NYSDEC), the topography of the site is generally low-lying and gently sloping, with the majority of the site sitting at an elevation of less than 10 feet (NAVD88) (NYSDEC, 2011 - 2012).

Soils data and soils descriptions for the Henry Hudson Park were acquired from the National Resources Conservation Service (NRCS) Web Soil Survey for Albany County, New York. The park was mapped as two soil types: Udipsamments, dredged and Teel silt loam (NRCS, Web Soil Survey).

Udipsamments, dredged soils are made up of very deep, level areas of well drained sand and gravel, formed from soil material pumped from the Hudson River. Typically, sandy material containing up to 35% gravel is deposited in layers up to 10 feet thick on top of the original soil. They are well drained, with a typical depth to water table of greater than 80 inches.

Teel silt loam soils are very deep, moderately well drained soils found on floodplains of major streams, formed from silty alluvium. The seasonal high-water table for these soils is 18 to 24 inches from February to April, and is occasionally flooded from November to May. It is not classified as hydric.

Literature Review and Cultural Resources within the Study Area

The prehistoric archaeological record for the Henry Hudson Park study area vicinity is similar to that of the Binnen Kill and Schodack Island sites. Evidence has been found of a Paleindian presence in the Hudson Valley as nearby as West Albany (Ritchie 1957). Although archaeological sites from the Early and Middle Archaic periods are rare in the region they do exist as evidenced by sites in Ulster County, Connecticut and the Upper Delaware Valley (Funk 1976, 1991). Sites from the Late Archaic and Woodland periods are more common in the northeast and regionally. Evidence of a Native American presence in the study area is well documented. There are three prehistoric archaeological sites within one mile of the study area. One of these sites (00102.000892) is a burial site that was discovered 0.17 miles south of the study area on a bluff overlooking the Vloman Kill.

Henry Hudson Park is believed to be located very near the place where Henry Hudson landed his ship, the Half-Moon, on his historic journey up the Hudson River. Early settlers were encouraged by the reports from Hudson and other early explorers who noted the beauty and richness of the land in the Hudson Valley. One of the earliest settlements in the area was Normansville, named for its location along the Norman Kill. Later settlement clustered around depots for the Delaware and Hudson Railroad in the mid-nineteenth century which extended its service through the town of Adamsville, later renamed Delmar. The study area is located near the site of the small community of Cedar Hill which is located near the confluence of Vloman Kill. A historic map dating to 1891 depicts the community of Cedar Hill as a fairly dispersed settlement with several ice houses along the banks of the Hudson, docks and a plaster mill along the Vloman Kill (Figure 14) (Beers 1891). A dyke is also depicted along the shoreline suggesting the beginning of dredge placement. No map documented structures are depicted

within the study area on the 1891 historic map. Topographic surveys dating back to 1898 show that the shorefront has been built up over the years with dredge material by the U.S. Army Corps of Engineers. Prior to 1925 the shorefront portion of the study area was within the Hudson River.

Several cultural resources investigations have been carried out in the vicinity of the study area. From 2001 to 2003 Hartgen Archaeological Associates, Inc. (HAA) conducted surveys in connection with improvements to the nearby Bethlehem Waste Water Treatment Plant located on the south side of the Vloman Kill. Archaeological testing was carried out for groundwater test wells in the vicinity of the proposed stabilization measures on the north side of the Vloman Kill and Hudson River confluence. Testing on both the north and south side of the Vloman Kill along the Hudson shoreline confirmed the existence of deep dredge material deposits (HAA 2002b and 2003).

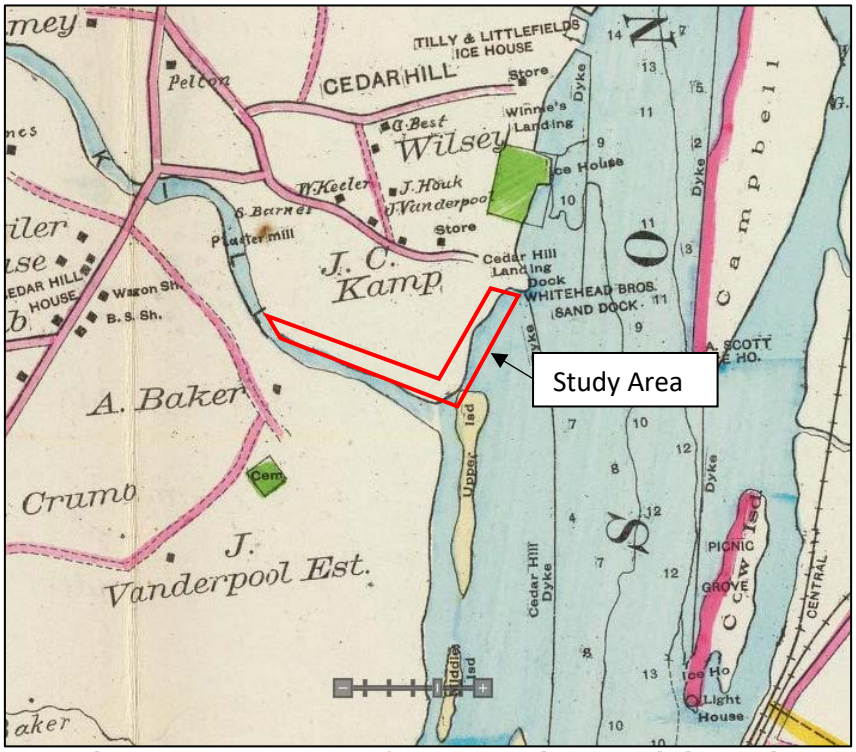


Figure 14: 1891 Map of Henry Hudson Park (Beers)

A site file search on the CRIS database revealed 11 archaeological sites within 1 mile of the study area. Three of the eleven sites were identified as prehistoric. In addition fourteen eligible or NRHP-listed properties are located with 1 mile of the study area. One of the listed archaeological sites, the Cedar Hill site (NYSM Site 6013), is located within the study area at its northern boundary. No information is available on CRIS for this site, however, it likely corresponds to the Cedar Hill Landing and the northern extent of a dyke constructed prior to 1891 as depicted on historic maps (Figure 14). The Nicoll-Sill House Site (00102.000004; NYSM Site 5781) is listed on the NRHP and is located directly across the Vloman Kill from the western tidal wetland area on the south bank. Archaeological evidence of Native American occupation has been recovered from the Nicoll-Sill House grounds as well as artifacts originating from the 17th through 19th century. A 19th century cemetery is located west of the house and in 2003 Native American human remains were identified in the vicinity during the installation of a water line by the Bethlehem Waste Water Treatment Plant. Subsequent investigations revealed several potential burials in the area. This Bethlehem Ancestral Repatriation Site (00102.000892), the Native American burial mentioned above, marks the location of the repatriated Native American remains (CITY/SCAPE: Cultural Resources Consultants 2013).

Recommendations

There are no extant structures located within the APE that have the potential to be determined eligible for the NRHP, however, there is one New York State Museum Site 6013 “Cedar Hill” located directly adjacent to the study area at its northern limit, no details were available in the CRIS database however it

is likely that this site corresponds to a historic dock labeled “Cedar Hill Landing” on historic maps (see Figure 14). The presence of several previously documented historic and prehistoric archaeological sites in the vicinity suggests that the area was utilized heavily both in precontact and contact periods. Considering that the shoreline portion of the study area contains deep dredge material deposits, the potential for historic archaeological remains to exist within the area of proposed shoreline stabilization measures is low. The 3.6 acre proposed wetland area along the bank of the Vloman Kill, however, is believed to have a moderate to high potential for historic and prehistoric remains due to its proximity to a river confluence and the discovery of several historic and prehistoric sites in the vicinity. A pedestrian survey and archaeological testing is recommended for the proposed wetland area to determine the presence or absence of archaeological sites and a geomorphological study is recommended to understand the depositional profile of the shoreline. Additionally, as plans are developed, areas identified for staging and access should be subject to a cultural resources assessment.

Charles Rider Park

Project Description

Charles Rider Park is a 29.6-acre public open space in the Town of Ulster, located on the west shore of the Hudson River a half mile downstream of the Kingston-Rhinecliff Bridge (Figure 16). The park’s amenities include a paved access road, parking areas, a picnic area, and a boat ramp/docking structure. The only access road to the park is Charles Rider Park Road which runs east from Ulster Landing Road. Approximately 5.5 acres of the park is actively managed, while the remaining area is primarily forested. The actively managed area of the park is located immediately adjacent to the Hudson River and is relatively flat. The actively managed area is bounded to the west by forested steep slopes.

The park contains approximately 1,200 feet of shoreline, which varies in condition. The paved areas of the park run close to the shoreline, separated from the shoreline edge by 15 to 50 feet of turf. The Hudson River is tidal in this area, and the exposed shoreline width ranges from approximately five to 25 feet at mean high tide and approximately 20 to 50 feet at mean low tide (Figure 17). The northernmost shoreline is part of a small cove sheltered by large rock material. This area has a gradual slope and the substrate is sandy. The eastern shoreline, along the Hudson River north of the boat ramp, consists of a stone filled timber cribbing which is dilapidated and has predominantly failed. The eastern shoreline, south of the boat ramp, consists of a stone filled timber cribbing which is dilapidated, however, the shoreline appears to be recently stabilized by large boulders. Heavily worn bricks and water chestnut seeds, are common throughout the shoreline. A remnant boat ramp structure is also present approximately 100 feet south of the active boat ramp.

One alternative was developed and advanced for Charles Rider Park. Under this alternative, shoreline modifications would allow for the establishment of tidal wetlands, which are not currently present on the site. Along the cove area, the existing rock stabilization would be reinforced with appropriately sized rock, and rock interstices would be filled with soil and planted with native vegetation. Along the eastern shoreline, the remnant boat launch would be removed. The existing timber cribbing would be reinforced, particularly along the northern portion, and a riprap toe would be installed where necessary. The top of bank would be graded back to the edge of the existing gravel or paved surface and large boulders would be placed to stabilize the shoreline. Suitable substrate would be backfilled between the

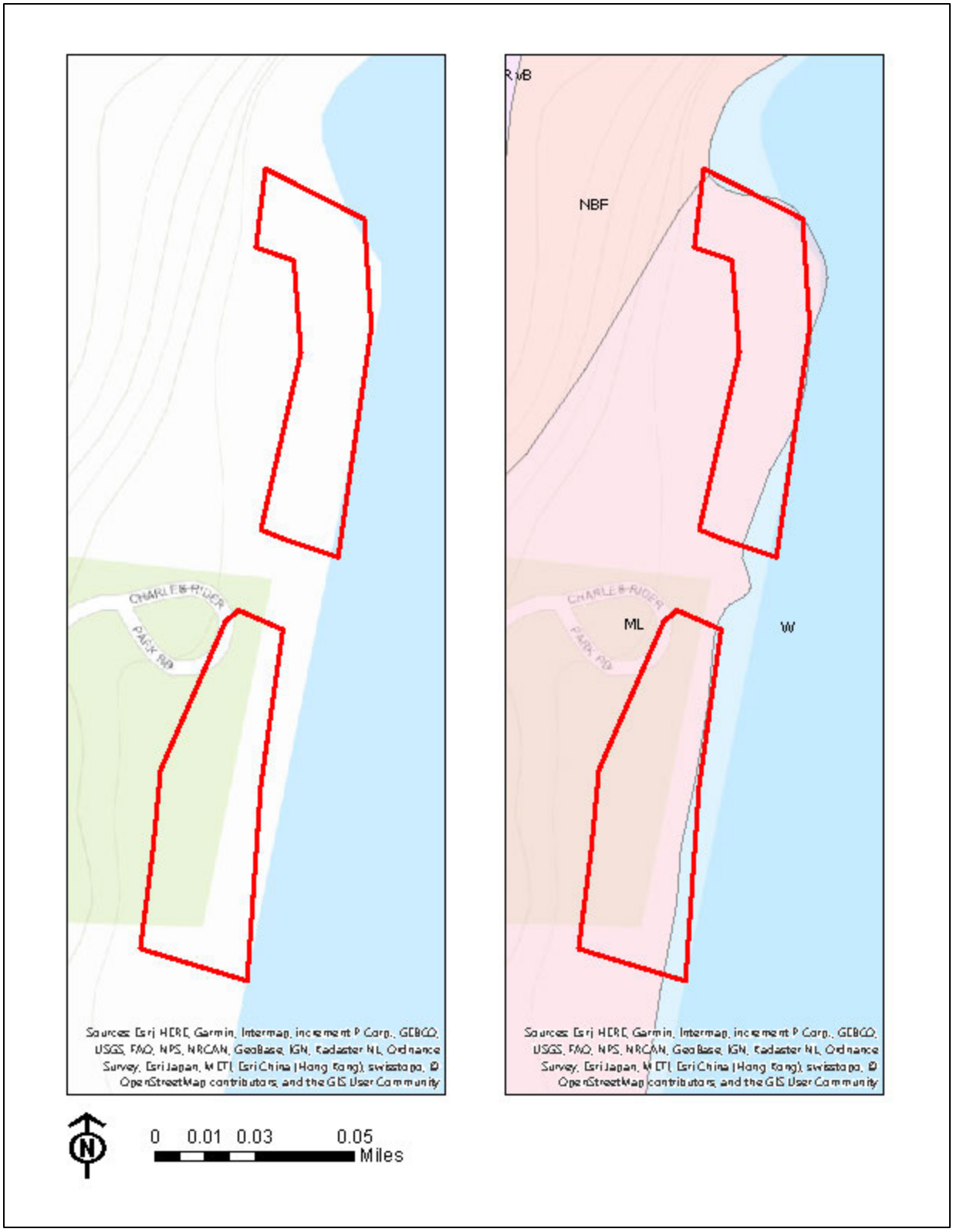


Figure 15: Charles Rider Park Study Area

top of bank and reinforced timber cribbing. The substrate would be graded to allow for intertidal flow and tidal wetland creation. Native wetland vegetation would be planted within the intertidal area. The Districts evaluation of the single alternative for Charles Rider Park has resulted in the determination that the plan is not cost effective and therefore no restoration measures are recommended for the site.

Environmental Setting

The site is within the Hudson-Mohawk Lowlands physiographic region. The Hudson River flows from the southeastern Adirondacks through a 15- to 20-mile-wide lowland area, which is bounded by the Helderberg Plateau and the Catskill Mountains to the west, and the Taconic Mountains to the east. This section of the Hudson River Valley consists of a narrow inner valley with adjacent terraces approximately 100-200 feet high, bordered by gently rolling terrain and low hills. The valley is underlain by weak sedimentary rock, primarily formed during the Cambrian and Lower Ordovician periods (NYS DOT, 2013). Specifically, the site is mapped as the Austin Glen Formation, which consists of highly folded, interbedded greywacke sandstone and shale that formed in a deep marine setting from the erosion of pre-existing sedimentary rocks (NYS Museum, 1995). In general, the surficial geology of the region is heavily influenced by its history of glaciation, including glacial till and lacustrine sediment deposited during the most recent glacial advance and retreat 70,000 to 16,000 years ago. The surface geology of the site is mapped as lacustrine silt and clay (NYS Museum, 1991). These sediments were deposited in glacial Lake Albany which was created from meltwater from the retreating glaciers flooding the Hudson Valley 15,000 to 12,600 years ago. These sediments are generally laminated and calcareous, with low permeability and variable thickness (De Simone et al., 2008).

Figure 16: Charles Rider Park

Soil mapping data and soils descriptions for Charles Rider park were acquired from the National Resources Conservation Service (NRCS) Web Soil Survey for Ulster County, NY. Most of Charles Rider Park's soils are classified as Made land with the exception of Clay Pit occurring around the park's entrance, as well as small areas of Nassau-Bath-Rock outcrop complex and Riverhead fine sandy loam (NRCS, Web Soil Survey).

The **Clay Pit** map unit has very little information available. Given that the site previously housed a brick factory, it is likely that this area provided raw materials to the factory. The map unit is moderately well drained, not hydric, and generally has a depth of 40 to 60 inches to lithic bedrock. Minor components within the map unit include Hudson, Madalin, Rhinebeck, and Odessa soils, all of which range in composition from silty clay to silt loam, and are formed from clayey and silty glaciolacustrine deposits.

Made Land soils are composed of Udorthents and similar soils, which are described at this location as having a surface layer of channery loam over very gravelly sandy loam. It is somewhat excessively

drained, and is not rated as hydric. As indicated by the name, they are made up of soil altered or transported by humans, such as fill or dredge spoils. The specific source of the Made Land soil is not known.

The **Nassau-Bath-Rock outcrop complex** map unit is composed of a mixture of Nassau soil, Bath soil, and unweathered rock outcrops. The Nassau soil is shallow, with 10-20 inches to bedrock, and is composed of channery silt loam over very channery silt loam. It is formed from channery loamy till derived from local slate or shale, and is found on ridges, till plains, and benches. It is somewhat excessively drained, and not rated as hydric.

Riverhead fine sandy loam is composed of fine sandy loam and sandy loam over sand. These soils are located on deltas and terraces, and were formed from loamy glaciofluvial deposits overlying stratified sand and gravel. It is deep and well drained, and is not considered hydric.

Literature Review and Cultural Resources within the Study Area

Archaeologists have uncovered evidence of a Native American presence from all major periods, from Paleoindian to Woodland on the western banks of the Hudson River in Ulster County (Ritchie 1994). Several large fluted points and unfluted lanceolate points, indicative of Paleoindian occupation are examples of the items recovered at these sites (Ritchie 1994). Few sites dating to the Early and Middle Archaic have been found in the area but several Late Archaic camps have been identified and range from small upland camps to large villages near the confluences of major streams (Funk 1991). A fairly large Late Woodland/contact period Esopus village was identified north of the City of Kingston just over a mile south of the study area.

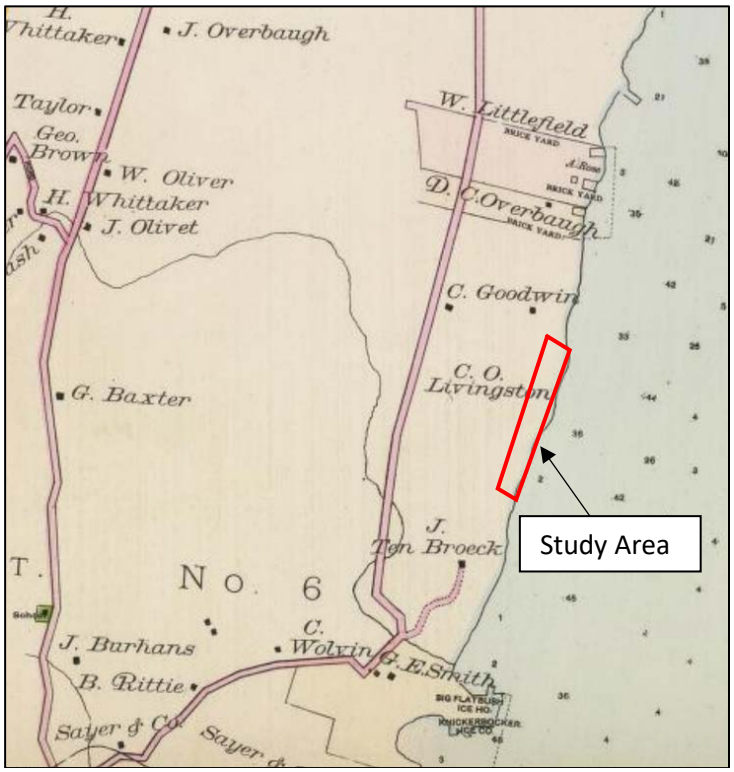


Figure 17: 1891 Map of Charles Rider Park Study Area

Thomas Chambers was an early settler of the Kingston area and one of the first to purchased land from the Esopus Indians in what is today Kingston, New York. The 1600s were marked by trade disputes and strained relations between Dutch settlers to the area and the Esopus Indians. Kingston quickly grew to become one of the largest nearby settlements eventually being named the first capital city of New York. Development throughout the County centered on ferry services, the Delaware and Hudson Canal, and eventually the Hudson River Railroad. Settlers made a living by extracting the natural resources found in abundance in the Mid-Hudson Valley and the region became well known for its high quality cement and blue stone. Ice harvesting, lumber and bricks were also common trades in the Valley and the ferries moved goods north and south. Eventually tourism became a large industry in the region as well (Fried 1975).

Charles Rider Park is located within a portion of Ulster County that has not been heavily built up. Before becoming a park, the site contained a brick factory with a number of structures including a bulkhead, docks, and multiple buildings. The structures are documented on USGS topographic maps published from 1934 to 1970 and historic aerial imagery and topographic maps indicate that the site transitioned to a park sometime between 1970 and 1995 (USGS Topographic Quadrangle 1934, 1939, and 1963).

There are no previously documented archaeological sites or historic properties located within the study area, however, the New York CRIS lists ten archaeological sites within 1 mile of the study area, seven sites are prehistoric and three are historic. There are four historic properties within a mile of the study area that are NR listed. These are the Kingston-Rhinecliff Bridge (U.S. Route 199), the Benjamin Ten Broeck House (05NR05471), the Sixteen Mile District (90NR00219) on the east bank of the Hudson River, and the Hudson River Historic District (92NR00302).

A high concentration of prehistoric and historic sites within 1 mile of the study area and the location at the Hudson River shoreline suggests that APE has a moderate to high sensitivity for archaeological sites where the construction of the park has not caused extensive disturbance.

Recommendations

No restoration measures have been recommended for Charles Rider Park therefore no further cultural resources investigations are recommended.

Moodna Creek

Project Description

Three proposed restoration sites lie along Moodna Creek, in Orange County, New York. These restoration sites (hereafter referred to as AOP1, AOP2, and AOP3), where proposed actions would be implemented, are each limited to a barrier structure and its adjacent waters (See Appendix A). AOP1, AOP2, and AOP3 lie approximately 1.8, 3.0, and 3.7 miles upstream, respectively, from the confluence of Moodna Creek and the Hudson River (Figures 18 and 19).

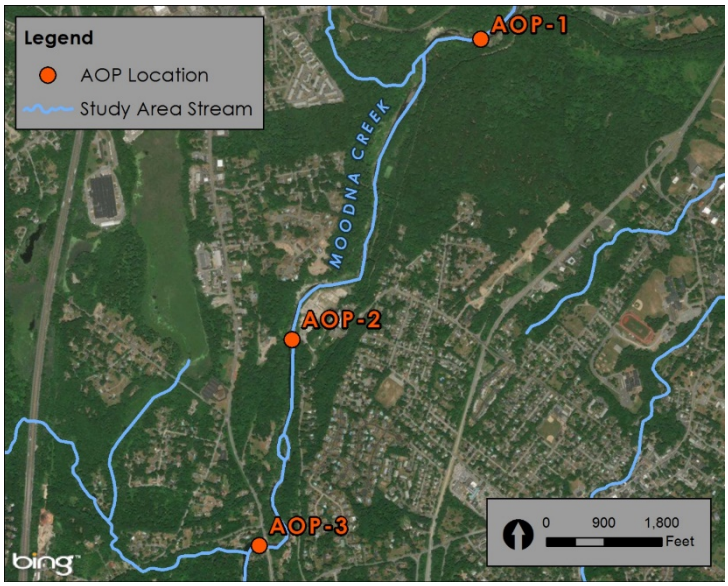


Figure 18: Moodna Creek Sites

AOP 1 – Utility Crossing

AOP1 lies on the border between the towns of Cornwall and New Windsor. AOP1 contains a concrete encased, decommissioned sewer line which forms a weir that creates a vertical drop of water approximately 2 feet in height. A deep scour hole is present on the downstream side of this structure. Through the review of existing information and site assessment, two alternatives were identified, which include (1) Utility Removal and (2) Rock Ramp. Alternative 1 entailed decommissioning the utility line and removal of the section that crosses Moodna Creek. The sanitary sewer line is a 16-inch ductile iron pipe (DIP); an approximately 100-foot-long section spans the channel and is contained in a concrete encasement approximately five feet wide and five feet deep. The recommended approach to decommissioning the line includes accessing the existing

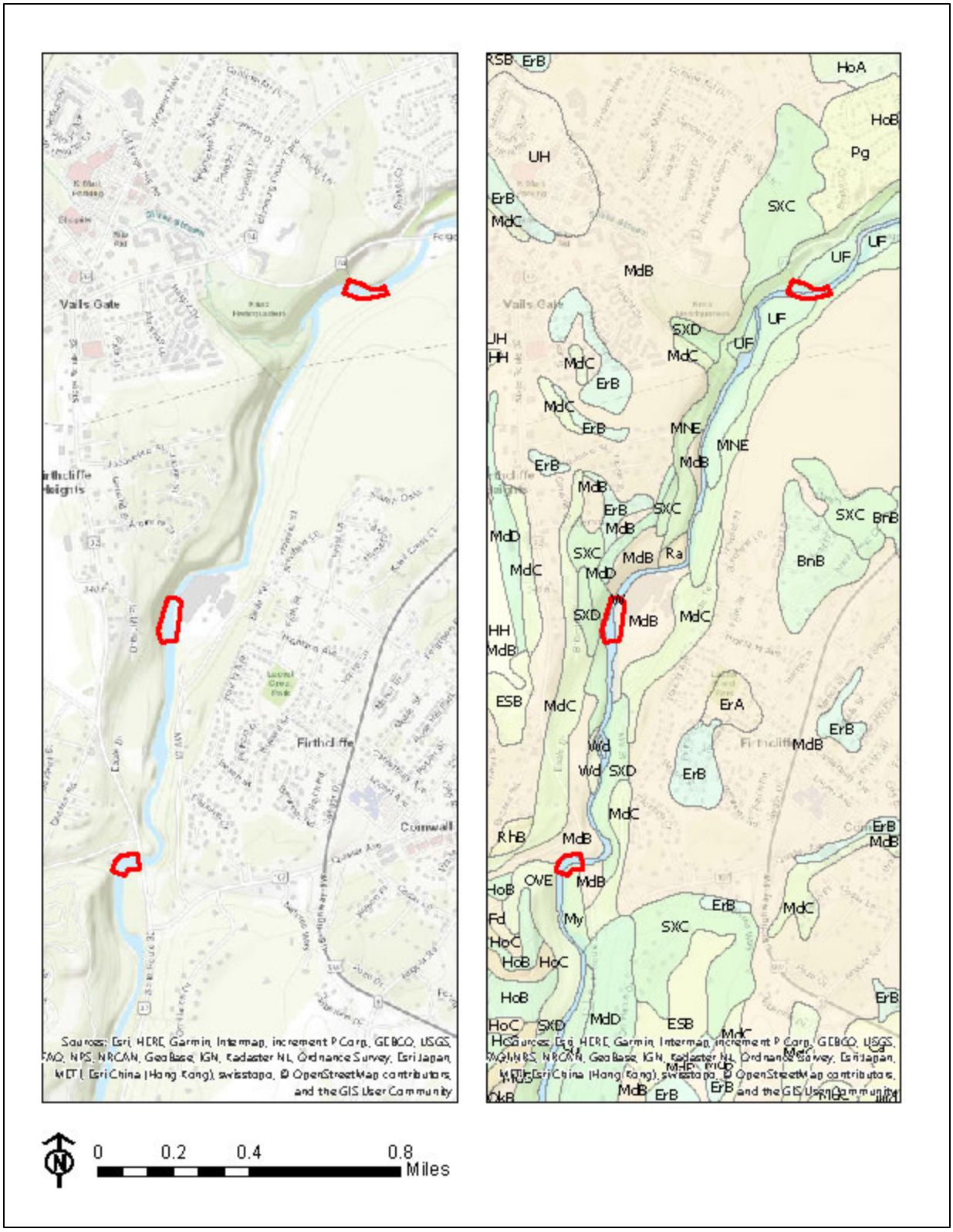


Figure 19: Moodna Creek Study Areas

manhole on the floodplain to the north (i.e. river left side), and sealing-off the incoming sanitary line with concrete or similar means. On the river right bank, where the utility descends steeply from the inactive railroad bed at the top of the slope, the recommended approach to decommissioning this sewer line is to break the existing line at the base of the slope and install a manhole in connection with upgrading the line, but with no outlet toward the Creek. The installation of the manhole on river right creates a stable and secure closure to the existing sewer line, and prevents any inadvertent leakage or discharge of fluid into the Creek, in the event of any unknown inflow or infiltration into the sewer line. A total of 175 feet of sewer line (100-foot concrete encased section and the 75-foot section under floodplain soils leading to the existing manhole) would be excavated and disposed of offsite. The proposed manhole could potentially be used to re-install the line in the future, if necessary.

Alternative 2 entails maintaining the utility line but constructing a stabilized boulder rock ramp on the downstream side that is fish passable. The rock ramp would be comprised of several boulder rock weirs and intervening pools that provide deeper, slower water to facilitate upstream fish passage. In addition, the existing utility crossing would likely require sheet-piling, or a similar subsurface barrier, installed upstream of the concrete encasement to eliminate the existing subsurface flow that is undermining the utility crossing as that could undermine the constructed rock ramp.

Figure 20: Moodna Creek AOP 1

Alternative 1, utility removal, was selected as the tentatively selected plan for Moodna Creek AOP 1. The Area of Potential Effect (APE) for AOP 1 consists of the manhole, sewer line and the area surrounding the sewer line and manhole site that would be required to access it. Staging areas and access roads may also be added to the plan as designs are advanced.

AOP 2 – Firth Cliff Dam

AOP 2 lies within the Town of Cornwall and contains a dam structure known as Firth Cliff Dam, which stands 9 feet high, and 162 feet long. This dam once provided hydro mechanical power to a former textile manufacturing factory, which has since been demolished. The remains of this industrial property lie adjacent to the AOP2 site. Through the review of existing information and site assessment, two alternatives were identified, which include (1) Dam Removal and (2) Fish Ladder.

Figure 21: Moodna Creek AOP 2

Alternative 1 entails demolition and removal of the concrete spillway to the full vertical extent and, pending favorable results of impounded sediment analysis, passive release of the impounded sediment. The abutments attached to the valley wall on river left and the building foundations on river right may be left in place pending observations from a more detailed site investigation.

Alternative 2 entails maintaining the dam spillway but installing a technical fishway that passes through or around the spillway. The entrance (i.e. downstream end) would likely be placed as close to the spillway as possible to ensure that fish that arrive at the dam, could still locate the fishway entrance.

Alternative 1, dam removal, was selected as the tentatively selected plan for Moodna Creek AOP 2. The APE for AOP 2 consists of the dam, the riverbed directly upstream and downstream as well as the channel banks. Staging areas have not been identified at this time but will likely be added to the design as plans are developed.

AOP 3 – Orrs Mill Dam

AOP3 lies within the Town of Cornwall and contains a dam structure known as Orr's Mill Dam, which stands 10 feet tall and 18 feet long. The Orr's Mill Dam is located directly upstream of the State Route 32 crossing. The dam is in poor condition as suggested by the cracks and holes in its spillway. Through the review of existing information and site assessment, two viable conceptual design alternatives were identified, which include (1) Dam Removal and (2) Dam Breach.

Alternative 1 entails demolition and removal of the concrete-capped, cobble/boulder-filled timber crib spillway to the full vertical extent and, pending favorable results of impounded sediment analysis, passive release of the impounded sediment. The abutment on river left associated with a former bridge may be lowered or removed entirely. The abutment on river right should remain as it is part of a retaining wall that protects the adjacent property.

Approximately 900 feet upstream of the dam, a pronounced boulder riffle indicates the upstream limit of the impoundment and would serve as a natural grade control that would limit the upstream extent of any adjustment in the main channel in the event of dam removal. Multiple extremely large boulders (i.e. five to ten feet in diameter) are situated immediately upstream of the spillway and likely form boulder-dominated steps or a cascade. At least one of the boulders may be a bedrock outcrop. If *in situ* boulders are insufficient to maintain a stable grade change and/or fish passage conditions, this alternative also includes supplementing this reach with large boulders to establish grade control.

Approximately 250 feet upstream of the dam, a smaller, cobble-dominated tributary, which flows under a residence, joins the main stem, forming a steep, cobble delta at the confluence. This tributary and confluence requires additional investigation and would likely necessitate a stone grade control structure to prevent undermining of the over-lying residence.

Alternative 2 entails breaking through the spillway concrete crest, and underlying cobble/boulder-filled timber crib structure, removing the vertical extent of a central portion of the spillway, and leaving the side portions in place. The ends of the spillway could be stabilized at their base with placed boulders, while the upper portions could be left open for visibility of the spillway's interior construction.

With the full vertical extent of the central portion of the spillway removed, a similar channel response is likely to be triggered as with full removal but with more retention of sediment on the channel margins proximal to the dam. The pronounced boulder riffle approximately 900 feet upstream of the dam would serve as a natural grade control that would limit the upstream extent of any vertical channel adjustment in the main channel if the dam is notched. The multiple extremely large boulders (i.e. five to ten feet in diameter) that are situated immediately upstream of the spillway are anticipated to form boulder-dominated steps or a cascade. Following dam notching, finer sediment would transport downstream, while the larger cobble and boulder may shift position. If *in situ* boulders are insufficient to maintain a stable grade change and/or fish passage conditions, this alternative also includes supplementing this reach with large boulders to establish grade control. As in the full dam removal alternative, the cobble-dominated tributary confluence requires additional investigation and would likely necessitate a stone grade control structure to prevent undermining of the over-lying residence.

Alternative 2, dam breach, was selected as the tentatively selected plan for Moodna Creek AOP 3. The APE for AOP 3 consists of the central portion of the dam, the area directly upstream and downstream that will be regarded, the confluence upstream and the areas of boulder placement. Additional areas that may be added to the APE as plans are developed are the banks further upstream and any areas where access and staging is required.

Environmental Setting

Moodna Creek is located at the transition between the Hudson-Mohawk Lowlands and Hudson Highlands physiographic provinces. The lowlands area situated to the north of Moodna Creek is underlain by weak sedimentary rock, primarily formed during the Cambrian and Lower Ordovician periods (NYSDOT, 2013). This area is mapped as the Normanskill Formation, which is characterized as dark green to black argillaceous shale containing calcareous and chert beds (NYS Museum, 1995). Post-deposition, the Normanskill shale was folded into a series of hills and valleys trending north-south (Laberge Group, 2011). The Hudson Highlands to the south of Moodna Creek are rugged mountainous terrain with ridges and valleys trending northeast to southwest. Bedrock is dominantly crystalline and has been metamorphosed. These rocks were originally emplaced during the Proterozoic period and have been since undergone several episodes of deformation associated with continental collisions, including extensive folding and metamorphism (NYSDOT, 2013). The area to the south of Moodna Creek is mapped as various granitis, gneisses, and paragneisses (NYS Museum, 1995).

Additionally, the surficial geology of the region is heavily influenced by its history of glaciation, including glacial till and lacustrine sediment deposited during the most recent glacial advance and retreat 70,000 to 16,000 years ago. Moodna Creek itself is mapped as alluvium, with surrounding areas mapped

primarily as till and includes areas of outwash sand and gravel, lacustrine deltas, and kame deposits (NYS Museum, 1991).

Figure 22: Moodna Creek AOP 3

The main stem of Moodna Creek is generally characterized by moderate gradient, cobble-boulder riffles and rapids, extended pools, and narrow floodplains confined by steep, erodible valley walls. As discussed above, the creek is located in an area where the lower relief and broader floodplains of the Hudson Valley lowlands are transitioning to the more rugged topography and narrow valleys of the Hudson Highlands. AOP1 is at an elevation of approximately 50 feet (NAVD88), with AOP2 and AOP3 at an elevation of 117 and 163 feet, respectively (NYSDEC, 2011 - 2012).

Soils data and soils descriptions for the Moodna Creek sites were acquired from the National Resources Conservation Service (NRCS) Web Soil Survey for Orange County, NY. The three barriers at the Moodna Creek site are associated with six different soil types: Mardin gravelly silt loam, Middlebury silt loam, Otisville, Hoosic gravelly sandy loam, Swartswood, and the Udifluvents-Fluvaquents complex (frequently flooded) (NRCS, Web Soil Survey).

Mardin gravelly silt loam soils are very deep, moderately well drained soils formed from loamy till on glaciated uplands. They have a dense fragipan starting at a depth of 14 to 26 inches, and typically have a perched water table during wet periods.

Middlebury silt loam is a moderately well drained soil found on flat floodplains, and is composed of silt loam, sandy loam, and gravelly fine sand. This soil is derived from loamy alluvium predominantly from areas of shale and sandstone with some lime-bearing material. It is not rated as hydric.

The **Otisville** series are very deep, excessively drained soils consisting of gravelly sandy loam over very gravelly sand. These soils are formed on outwash plains and terraces, from sandy and gravelly glaciofluvial deposits, and have high permeability.

Hoosic gravelly sandy loam soils are formed from sandy and gravelly glaciofluvial deposits on deltas, outwash plains, and terraces. They are very deep and somewhat excessively well drained, with rapid permeability.

The **Swartswood** series are deep, well drained soils consisting of gravelly loam over gravelly fine sandy loam. They are found on hills and till plains and are formed rom till derived primarily from gray and brown quartzite, conglomerate, and sandstone.

Udifluvents-Fluvaquents complex soils are found in flat areas on floodplains. Fluvaquents are formed from silt loam over gravelly silt loam, located in low areas that flood frequently. They are poorly drained, and rated as hydric. Udifluvents are found in slightly higher areas and are composed of gravelly fine sandy loam over gravelly sandy loam. They are moderately well drained, with a typical depth to water of 24-72 inches, and are not rated as hydric. Both are formed from alluvium with a highly variable texture and have variable profiles.

Literature Review and Cultural Resources within the APE

Traces of Paleoindian, Archaic and Woodland period Native American occupation have been documented in the region and include village sites, camps, procurement sites, and burial grounds. European occupation of the Towns of Cornwall and New Windsor dates to the early part of the eighteenth century when most settlement was focused along the Hudson River at Orangeville and the hamlet of New Windsor. Small settlements developed around the intersections of major roads and watercourses. The hamlets of Orrs Mills, Townsville, Canterbury and Vails Gate developed around mill sites. Railroads constructed in the latter half of the nineteenth century brought new commercial and industrial activity as well as residential developments. Firthcliffe Station, Cornwall Station, and Meadowbrook are examples of this. Outside of the nucleated settlements were farms and though most of the farms are no longer in operation in the area, many of the farmhouses and ancillary structures remain. As the nearby City of Newburgh grew as a rail and river shipping hub, the manufacturing centers in smaller hamlets declined and became primarily residential communities. The area surrounding the APE remained rural through the early twentieth century but rapid development beginning in the 1950s has transformed the Towns of Cornwall and New Windsor into suburbs.

AOP 1 – Utility Crossing

The site of the proposed work has not been subject to a cultural resources survey however several surveys have been conducted in the vicinity (See Appendix B). There are 14 archaeological sites listed within 1 mile of the AOP 1 study area. Five of the sites are prehistoric and several of the prehistoric sites (07115.000704; 07115.000705; and 07115.000028) are located within the Moodna Creek corridor on dry elevated ground overlooking the Creek. Most of the prehistoric sites within 1 mile of the APE have not been associated with a particular period

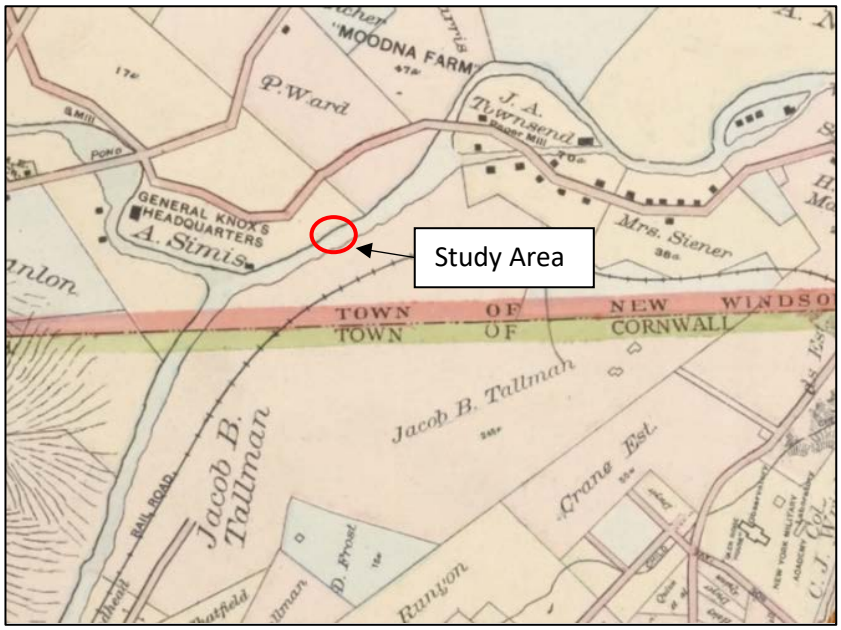


Figure 23: Historic Map of AOP 1 Study Area (Beers 1891)

or cultural affiliation. The two nearest sites consist of a single flake at each location and were recovered during a cultural resources survey for the proposed Cornwall Commons Development project (Oberon 2006). The Nicoll Farm Site (07115.000018) was recorded by Funk (1976) and contained evidence of Paleoindian through Woodland period activity. Just over 1 mile from the APE is the site of a Woodland period village (NYSM 4381) (Figure 21).

New York State CRIS lists six properties that are listed or eligible for listing on the NRHP within 1 mile of AOP 1. The nearest historic property is Knox's Headquarters/John Ellison House (90NR02311) which was built in 1754 and served as the headquarters for Major Generals John Knox, Nathanael Greene, Fredrich von Steuben, and Horatio Gates during various encampments of the Continental Army at New Windsor. The site consists of approximately 50 acres including the house and grounds and the boundaries of the property are adjacent to the boundaries of the current APE.

AOP 2 – Firthcliff Dam

Several surveys have been conducted within the vicinity of the Firthcliff Dam however none have been carried out for the current AOP 2 study area. There are two archaeological sites in the CRIS system within 1 mile of AOP 2. These are the Woodward Historic Site (07103.000253) and the Cornwall Commons Stray #2 (07115.000705). There are thirteen sites that are eligible or listed on the NRHP within 1 mile of AOP 2. A notable site that is located only 0.13 miles north of study area is the Woodruff House Site (90NR03061). The Woodruff House is a stone vernacular farmhouse constructed in the early part of the nineteenth century along NYS Route 32. The house was originally part of a larger farm situated on a hill above the Moodna Creek.

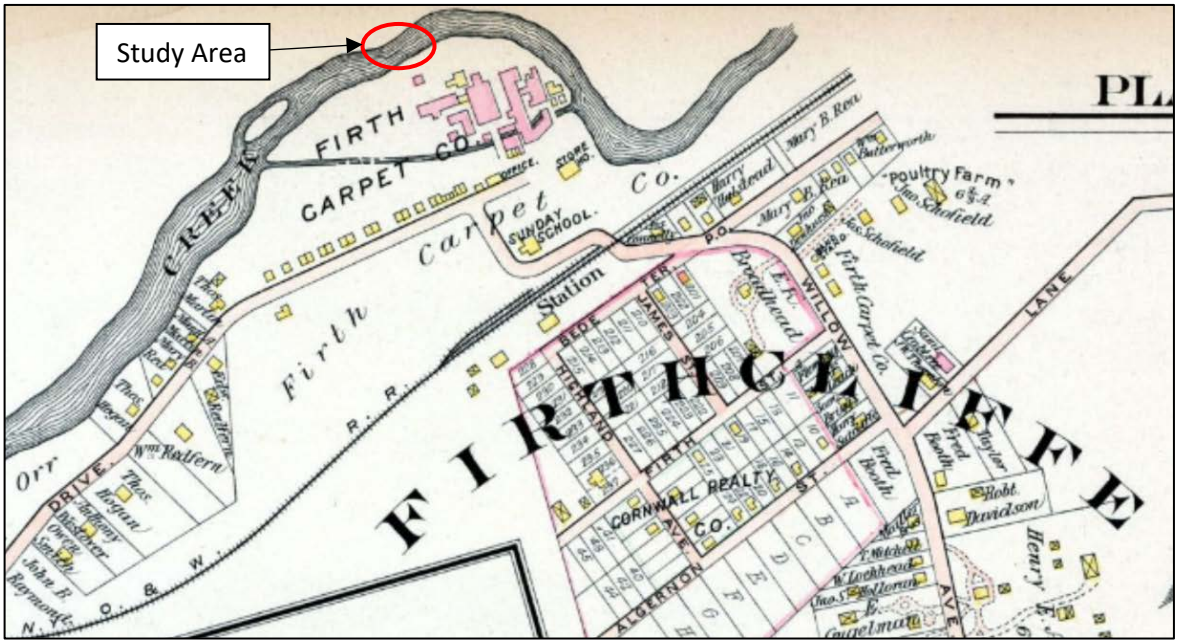


Figure 24: Historic Map of the AOP 2 Study Area (Lathrop 1903)

A large factory complex associated with the dam was once situated directly east but was recently demolished (07149.000103). The factory was known as the Firth Carpet Company complex. The complex was located between the Moodna Creek and Mill Street. When the site was documented as a historic

property in 1982 it contained a wood framed administration building, brick wool washing and storage building, two large factory buildings and several smaller buildings including a machine shop, dye house and pump house. The mill was situated on the site of the former Townsend Mill built in the 1840's and the Broadhead's woolen mill, built in the 1860's. In the 1880's Percy Firth adapted the existing mill structures to establish his carpet manufacturing company. The last phase of construction is believed to have been completed in 1928. In the early part of the twentieth century the Firth Co. began acquiring property off Willow Avenue to build duplexes for their employees. Many of those homes remain along Willow Avenue today. In 1960 the Firth operation was moved to North Carolina and the Majestic Weaving Company used the facility until 1982. A fire destroyed the complex in 2012 forcing the demolition of the buildings.

AOP 3 – Orr's Mills Dam

There are no archaeological sites listed in the CRIS database within 1 mile of AOP 3. There are twenty-six previously documented NRHP eligible or listed sites within 1 mile. The Route 32 Bridge over Moodna Creek has been evaluated and determined not eligible for the NRHP. Several cultural resources investigations have documented the historic mill features along Moodna Creek. Surveys carried out in connection with the West Point Pipeline Project and the Catskill Aqueduct Connection Phase II Transmission Line Project along NYS Route 32 identified the historic structures in the vicinity of the Orrs Mills Road and Route 32 intersection including the Moodna Mansion/William Orr House, the Orr's Summer House and Orrs Mill as well as the historic dam, raceway, stone walls, and culverts (Sandy and Schneiderman 2017). Several Orr's Mills historic properties have been documented as historic properties starting in the 1970s. The Moodna Mansion (07103.000060), Orr's Summerhouse (07103.000059), Orr's Mill (07103.000063), and William Orr House (07103.000246) have individual listing in the CRIS database. A 1997 eligibility determination on file with the NYSOPRHP states the following:

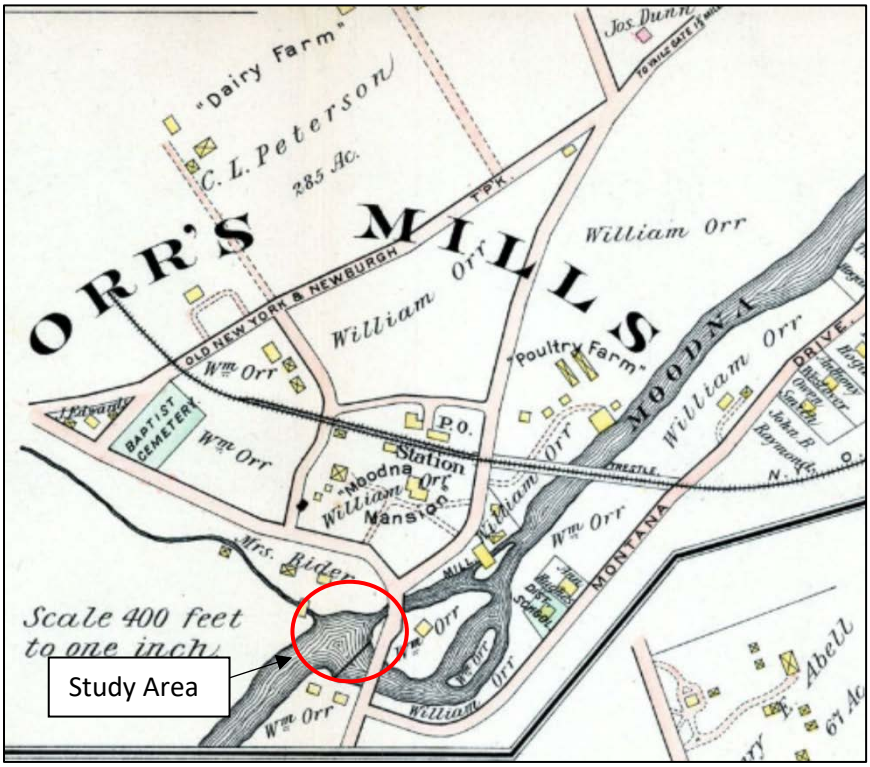


Figure 25: Historic Map of the AOP 3 Study Area

> "Based on limited information provided for the project, the collection of residential, industrial, and engineering structures and sites associated with the former Orr's Mill are eligible for inclusion in New York State and National Registers of Historic Places. The district includes several features associated with the development and evolution of this

site. These features include the home of William Orr (Moodna Mansion, 1870); the Orr "Summerhouse" (ca. 1750 core, enlarged ca. 1870); the ruin of the 40 by 80 foot, three story Orr's Mill (ca. 1866); a nineteenth century wood frame mill worker's cottage; a late nineteenth century outbuilding (formerly used as an industrial building); boathouse; mid-nineteenth century bridge remnants (abutments); early twentieth century stone foot bridge; and extant waterpower features including the impound area and dam.

Collectively, the components of this district chronicle the evolution of this site from the earliest days of settlement in the area, through the initial industrial development of William Townsend, to the acquisition of the site by Englishman, William Orr. During his tenure on the property Orr established a prosperous Cornwall Mill complex on the site. The mill continued to operate into the twentieth century. Associated with the industrial aspect of the district are several houses that in their size and style recall the prosperous era of the mill. The significance of the complex is further enhanced by the rural setting and water features associated with the district."

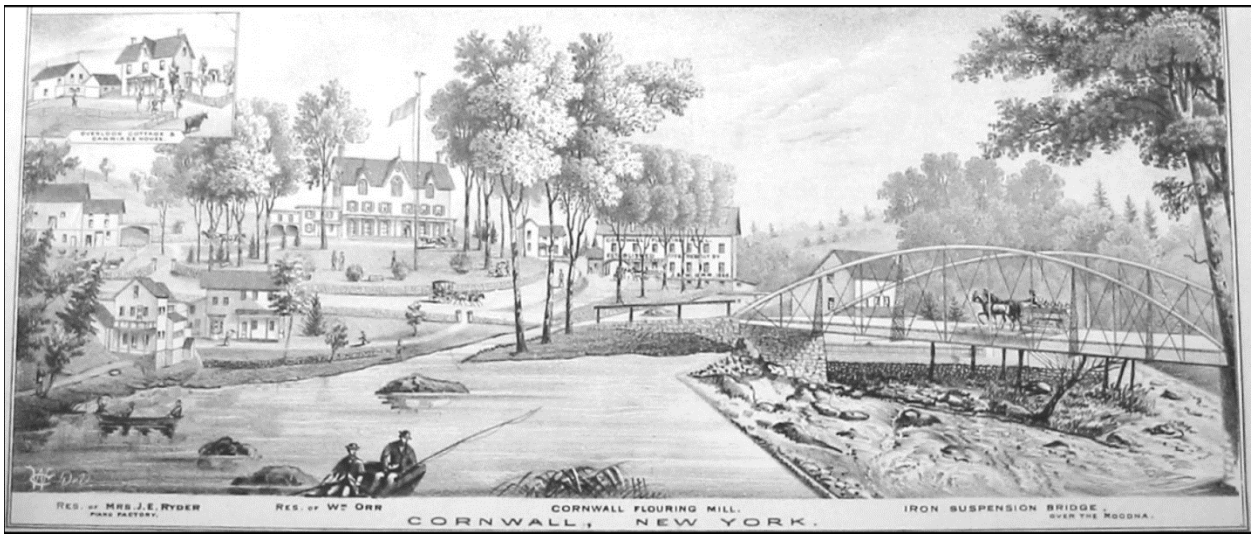


Figure 26: Artist's Rendering of Orr's Mills (Lathrop 1903)

A limited walkover survey of the area confirmed the existence of many of the structures and features previously documented, however, it was not possible to confirm the existence of all of the features.

Recommendations

AOP 1 – Utility Crossing

The presence of historic properties and prehistoric occupation within the vicinity of the APE suggests that there is potential for archaeological resources in areas not recently disturbed. However, the installation of the sewer main in the APE would likely have destroyed any archaeological sites that may have existed there. The proposed work at AOP 1, therefore is not expected to have an adverse effect on cultural resources, however, as project plans are developed and access and staging areas are selected additional areas outside the boundaries of previous work would be sensitive for prehistoric and historic

archaeological sites. As plans are developed and the APE is better defined a cultural resources survey is recommended to determine the presence or absence of cultural resources within the project area.

AOP 2 – Firthcliff Dam

The Firthcliff Dam is potentially eligible for the NRHP. Additional research and an assessment of the dam itself will be required to determine the eligibility of the structure. Furthermore, there is a potential for elements of earlier dam structures to lie below the existing structure as there have been several mills at the site beginning in the 1840's. Future work should include additional background research, an evaluation of the structure and coordination with the NYSOPRHP to determine the need for archaeological monitoring at the site.

AOP 3 – Orr's Mill

The Orr's Mill Dam and the mill pond are potentially contributing elements to a historic district centering on the Orr's Mill at the intersection of Orr's Mills Road and NYS Route 32. Removal of the dam could potentially alter the character of the historic district and the structure itself has the potential to be determined eligible for the NRHP. Several surveys have been conducted in the area but a comprehensive survey of the dam and the historic district will be necessary to determine the eligibility status of the historic properties both individually and collectively and to determine the effect of the proposed notching of the dam.

Rondout Creek - Eddyville Dam

Project Description

The restoration site (hereafter referred to as "the site"), where proposed actions would be implemented, is limited to the Eddyville Dam and its adjacent waters. The site is located in Rondout Creek along the border of the Towns of Ulster and Esopus, in Ulster County, New York. Rondout Creek is a major tributary to the Hudson River and the dam is located approximately 3.6 miles upstream of the confluence with the Hudson River. The dam is 220 feet long and 12 feet high, with a spillway on the left bank. The dam is constructed from stone masonry capped with concrete and is classified as a Class A – Low Hazard dam, indicating that a dam failure is unlikely to result in major damage.

Through the review of existing information and site assessment, three viable conceptual design alternatives were identified which include (1) Fishway, (2) Dam Removal, and (3) Dam Notching. The Fishway alternative entails the construction of a technical fishway at the dam. A nature-like fish bypass would not be feasible at this location due to the confining valley walls and deep river depths upstream and downstream of the dam. A technical fishway would be most feasible if situated on the river left side of the spillway making use of the existing lower spillway crest and less steep river rapids extending downstream. Fishways typically are not capable of restoring fish passage to the full range of diadromous or resident fish, or all size classes (e.g. age classes), and are therefore considered to be partial restoration of passage at a dam. With a technical fishway, the dam spillway would remain, and therefore normal water surface elevation in the impoundment would change minimally from existing conditions. With minimal change to the dam and the impoundment, there would be little or no change in actual water quality conditions nor any cause for a change in designated water quality classifications. Furthermore, there would be little or no change to upstream river habitat conditions (other than

through the introduction of previously excluded native species), riverfront properties, or river navigability.

Dam Removal entails removal of the entire concrete spillway down to the elevation of the underlying bedrock. The free-standing masonry training wall may remain, pending more detailed site investigation and survey. Normal water surface elevation would drop approximately 10 feet in the upstream vicinity of the dam and tidal fluctuation would extend upstream into the impoundment. Despite full removal of the spillway, a bedrock ledge feature would likely remain onsite in some form, separating the deeper portions of the river bed upstream and downstream. This bedrock ledge may still be visible at the surface at some point during the daily tidal fluctuation and variation in river flows; although, more detailed site survey and hydrologic and hydraulic analysis are needed to affirm this with greater specificity. The multiple papers about the Hudson River and Rondout Creek make a strong case for the potentially profound impacts this dam removal could have on the fishery. With such a diverse fish community immediately downstream in the Hudson River and the lower reaches of Rondout Creek, many fish are poised to benefit from the removal of the dam and reconnection to approximately seven miles of river upstream. As the first barrier on Rondout Creek, Eddyville Dam is the most important barrier to be considered for removal in the river system.

Figure 27: Eddyville Dam

Dam Notching was also considered at this location. This alternative involves removing a portion of the spillway, likely in the center, to provide for fish passage and leaving the remainder of the spillway intact at its existing elevation. This extent of the notch (width and depth) of the spillway would be determined through detailed site survey and hydrologic and hydraulic analysis to create optimal hydraulic conditions for upstream fish passage for as many target species as possible. Notching, as opposed to full removal, allows a portion of the spillway to remain as an enduring feature on the site and physical marker of the historic dam. Similar to current conditions, the remaining spillway would be subject to slow deterioration due to weathering and river conditions (freeze/thaw, ice floes, scour, abrasion, debris impact, etc.). The notching of the dam would also result in a reduction in normal water surface elevation albeit less than the full removal, in addition to an upstream tidal influence likely less than the full removal would create. Similar to dam removal, notching could have potentially profound impacts on the fishery if the notch is wide enough such that optimal hydraulic conditions are created and the full gamut of potential fish able to benefit could pass upstream.

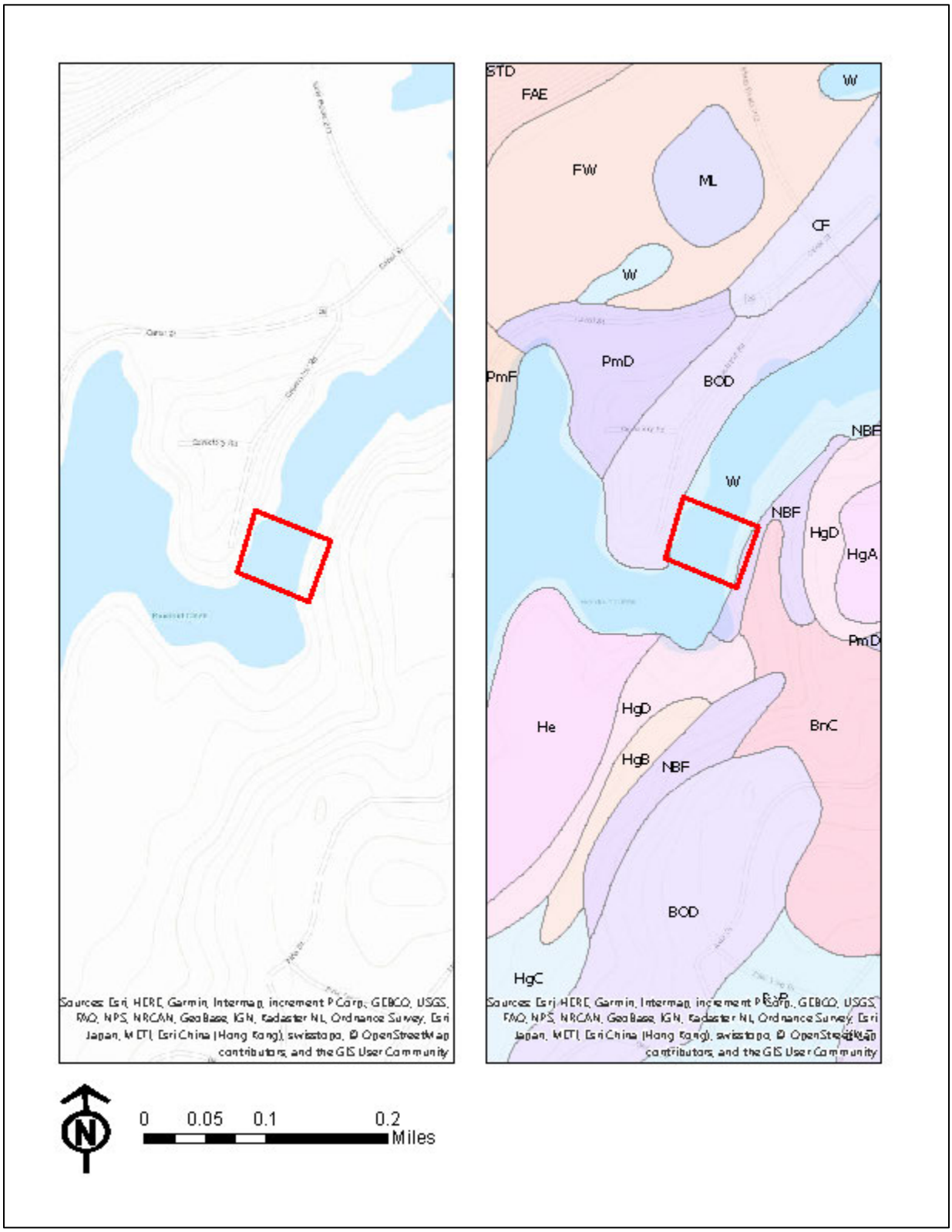


Figure 28: Rondout Creek Study Area

Environmental Setting

The site is within the Hudson-Mohawk Lowlands physiographic region, in the Wallkill River Valley. The lowlands in this area are underlain by weak sedimentary rock, primarily formed during the Cambrian and Lower Ordovician periods. Specifically, the Rondout Creek site is mapped as underlain by the Austin Glen Formation, which consists of highly folded, interbedded greywacke sandstone and shale that formed in a deep marine setting from the erosion of pre-existing sedimentary rocks (NYS Museum, 1995). The lower Rondout Creek and Wallkill River valley are bounded by the Catskill Mountains to the west\ and the Marlboro Mountains to the east (USGS, 2003).

In general, the surficial geology of the region is heavily influenced by its history of glaciation, including glacial till and lacustrine sediment deposited during the most recent glacial advance and retreat 70,000 to 16,000 years ago. The Rondout and Wallkill valleys generally contain lacustrine silt and clay soils (NYSDOT, 2013). However, these sediments have been reworked by stream flow and the site is currently mapped as alluvium (NYS Museum, 1991). The area to the east of creek is mapped as till and the area to the west of the site is mapped as lacustrine silt and clay and till.

Eddyville Dam is situated in a narrow valley with steep bedrock walls. The dam is built on a bedrock ledge, with the dam crest at an elevation of 4 feet (NAVD88). The river bed is highly irregular in the vicinity of the dam, with bed elevations ranging from -45 feet to -14 feet below the dam, and -25 to -6 feet above the dam (FEMA, 2016b). Several pools with water depths up to 48 feet are present above and below the dam, which have been attributed to excavation of rock for use in construction of the nearby Delaware and Hudson Canal. The dam is located at a sharp bend in the river, though the Rondout channel was significantly altered during the period when the canal was developed, and the dam location is likely not the original channel for the creek (D. Miller, personal communication, 2018).

Soils data and soils descriptions for the Rondout Creek site were acquired from the National Resources Conservation Service (NRCS) Web Soil Survey. The area around the dam at the Rondout Creek site is composed of various complexes of rock outcrops, Bath gravelly silt loam, and Nassau shaly silt loam soils (NRCS, Web Soil Survey).

The **Bath** series consists of very deep, well drained, gravelly loam and silt loam soils. They are formed from loamy till derived mainly from gray and brown siltstone, sandstone, and shale, and are found on hills, ridges, and till plains. A fragipan is typically present at a depth of 26-38 inches, limiting root growth.

The **Nassau** series consists of somewhat excessively drained channery silt loam soils formed from channery loamy till derived mainly from local slate or shale. They are found on summits, shoulders, and back slopes of ridges and hills on glaciated uplands. The soil is shallow, with 10-20 inches to bedrock.

Literature Review and Cultural Resources Within the Study Area

There are five archaeological sites listed within 1 mile of the study area. Most prehistoric sites in the area are located on terraces overlooking Rondout Creek. In the early 1600's the Dutch established a small fortification at the mouth of the Rondout Creek in what is today the City of Kingston. Farming was the primary industry in the area during the 17th, 18th and 19th Centuries though several mills were operated along the Rondout Creek in the 1800s and the community engaged in commercial trade along the Hudson River. A major turnpike, built in 1831 increased the trade in the area and the construction of the D&H Canal in the 1820s brought goods and raw materials, mainly coal, from Pennsylvania. In the

twentieth century the Catskills became a desirable location for resort communities and several sprang up in the region (Hartgen 2002).

A review of the New York State CRIS lists five cultural resources surveys within a mile of the study area. No surveys have been carried out to date for the immediate study area and vicinity. In 2001 a survey was conducted for a 37 acre area quarry (HAA 2001b). Background research and site inspections revealed that portions of the site had been disturbed by previous quarrying activities but the northern and western limits of the project area were sensitive for prehistoric remains. The field investigation resulted in identification of a 0.4 acre precontact quarry site, the Eddyville Mine (OPRHP# 1118.000044) in the western portion of the project area. Additional testing at the site in 2017 recovered no archaeological remains (Hartgen Archaeological Associates 2017).

There is one NRHP eligible historic resources on file within 1 mile of the project area. This is the Route 213 bridge over the Roundout Creek (BIN 1041200) (DOE 11/20/2014). The bridge was built in 1957 and is of half-through steel arch construction, one of few examples of its type.

Figure 29: Canal Features in the Vicinity of the Study Area (Source: Dan Miller, NYSDEC)

The Eddyville Dam itself is likely to be determined eligible for the National Register of Historic Places for its connection to the D&H Canal. The dam is of a stone masonry construction capped with concrete. Surveys of the dam have identified possible timber cribbing on the upstream side of the dam and on the downstream the dam appears to be braced by an existing bedrock ledge (USACE, New York District 2019). Riverbed surveys indicate that the bedrock up and downstream of the dam was mined at some point in time and it is likely that the course of Rondout Creek has been altered over time, particularly with the construction of the D&H Canal system. Descriptions of Eddyville and the dam refer to the community as being situated “below the rapids” and the dam as “Eddyville Falls.”

Recommendations

The study area is believed to have a high potential for prehistoric archaeological sites due to the presence of precontact archaeological sites in proximity to the Rondout Creek and confluence with the Hudson River however the Area of Potential Effect (APE) for the removal of the Eddyville Dam is likely to have been heavily disturbed over time. An architectural and historical survey of the Eddyville Dam is recommended to document the development of the area and the construction and use of the dam over the years and to determine whether the dam is eligible for the NRHP either individually or as part of a larger historic district including the D&H Canal. As plans are developed additional areas identified for staging and access may also require a cultural resources assessment.

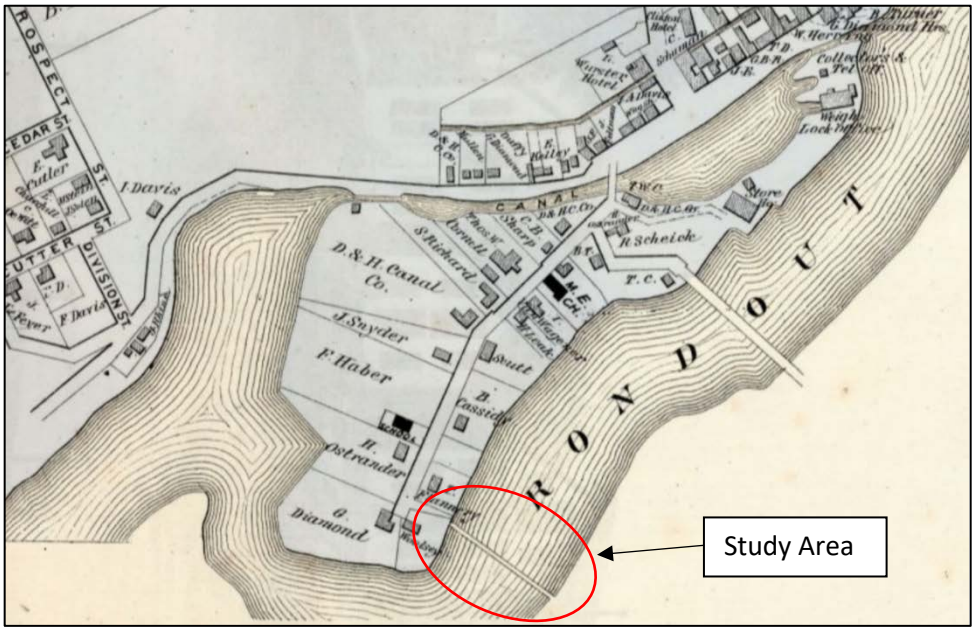


Figure 30: Historic Map of the Rondout Creek Study Area (Beers 1891)

Conclusion

A preliminary cultural resources assessment was completed for six proposed restoration sites. Restoration measures have been recommended for five of the six sites and preliminary recommendations were prepared to address potential adverse impacts to historic properties eligible for listing or listed on the NRHP. As plans are developed the APE will be refined for each site. A Programmatic Agreement is being prepared to guide Section 106 activities as the project advances and project plans are developed. Section 106 activities shall include archaeological and architectural surveys to complete the identification of NRHP eligible or listed resources within the APEs and the steps required to address adverse effects should impacts be identified. Coordination with the NYSOPRHP, the ACHP, Native American Tribes, and other interested parties is an essential component of the Section 106 process and the timing and nature of that coordination is laid out in the PA as well.

References

Alden, Gregory, Thomas Cook, P.E., and Edward Taft
2006 Hudson River Shoreline Restoration Alternatives Analysis. Prepared for New York State Department of Environmental Conservation.

Alfieri, J., Berardis, A.; Smith, E.; Mackin, J.; Muller, W.; Lake, R.; Lehmkulh, P.
1999 The Lenapes: A study of Hudson Valley Indians. *Poughkeepsie, New York: Marist College.*

Baldwin, Geraldine E., Belinda Cox, Joel I. Klein, Lori Aument, Lee Cox, and Dan Leib
2011 Schodack-Houghtaling Island Cultural Resources Investigation, Town of Baltimore, Greene County, New York. National Historic Preservation Act Cultural Resources Investigation Report No. 5, (Volume I), American Recovery and Reinvestment Act 2009 Section 110 Compliance Report for the US Army Corps of Engineers, New York District. John Milner and Associates, Inc.

Beers, F.W.
1891 Portion of Albany County. Portion of Rensselaer County. From Atlas of the Hudson River Valley from New York City to Troy, including a section of about 8 miles in width. Watson & Co., New York.

Cheplowitz, Nicole
2015 Revised Initial Site Analysis Technical Memorandum for the Evaluation of Backwater Channel and Shallow Water Habitat Restoration at Schodack Island State Park. Ecology and Environment Engineering, P.C.

CITY/SCAPE: Cultural Resources Consultants
2013 Bethlehem Waste Water Treatment Plant Improvement, Supplemental Trenching Protocol. Dinmore Road, Town of Bethlehem, Albany County, New York.

De Simone, D.J., Wall, G.R., Miller, N.G., Rayburn, J.A., Kozlowski, A.L.
2008 Glacial Geology of the Northern Hudson through Southern Champlain Lowlands. Guidebook to Field Trips For the 71st Annual Reunion Northeastern Friends of the Pleistocene. http://www2.newpaltz.edu/fop/pdf/NEFOP2008.pdf

De Lisser, Richard Lionel
1984 Picturesque Ulster. The Hope Farm Press, Cornwallville, NY.

Diamond, Joseph E.
1990 Reconnaissance Level Survey of Archaeological Resources in the City of Kingston, NY.

Fried , Marc B.
1975 The Early History of Kingston & U;ster County, NY. U;ster County Historical Society, Marbletown, Kingston, NY.

Friends of Schodack Island State Park

2017 History of Schodack Island. http://friendsofschodackisland.org/history-of-the-schodack-islands/

Funk, Robert E.

1976 Recent Contributions to Hudson Valley Prehistory. New York state Museum and Science Service Memoir 22. The State Education Department of the University of the State of New York, Albany.

1991 The Middle Archaic in New York. Journal of Middle Atlantic Archaeology 7:7-18.

Harmon, Daniel E.

2004 The Hudson River. Chelsea House Publishers.

Harris, Wendy and Arnold Pickman

1997 Ice Industry Associated Remains on Portions of Schodack-Houghtaling Island Owned by the U.S. Army Corps of Engineers: A Preliminary Assessment. Town of New Baltimore, Greene County, NY.

2000 Cultural Resources Investigation Hudson River Habitat Restoration Study, Mill Creek Marsh, Town of Stuyvesant, Columbia County, NY. Schodack-Houghtaling Island, Town of New Baltimore, Greene County, New York.

Hartgen Archeological Associates, Inc. (HAA)

1998 Phase I Archaeological Investigation Castleton Island State Park, Town of Schodack, Rensselaer County, New York.

1999 Addendum Report, Phase 1 Archeological Field Investigation, Wetland Mitigation Areas 1 & 2, Schodack Island State Park, Town of Schodacl, Rensselaer County, New York.

2000 Phase II Archaeological Investigation Access Road, Schodack Island State Parkm Town of Schodack, Rensselaer County, New York.

2001a Monitoring Wetland Mitigation Area and Boat Launch Installation Schodack Island State Park, Town of Schodack, Rensselaer County, New York.

2001b Phase IA Report for Archaeological Potential Sensitivity Assessment and Phase IB Field Investigation, Eddyville Mine, Town of Ulster, Ulster County, New York.

2002a Phase IA Literature Review and Sensitivity Assessment of PIN 8757.10, Abeel Street Reconstruction Project, City of Kingston, Ulster County, New York.

2002b Phase IB Archaeological Field Reconnaissance of PIN 8757.10, Abeel Street Reconstruction Project, City of Kingston, Ulster County, New York.\

2002c Addendum Report, Archaeological Monitoring Investigation, Schodack Island State Park Comfort Station Building, Water Treatment Building and Water Line Excavations, Town of Schodack, Rensselaer County, New York.

2003 Phase IB Archaeological Field Reconnaissance, Bethlehem Water Supply Line, Town of Bethlehem, Albany, County, New York.

2016 Phase I Archaeological Investigations, Selkirk Industrial Park, State Route 144, Town of Bethlehem, Albany County, New York.

Huey, Paul R.

1997 Historical and Archaeological Resources of Castleton Island State Park, Towns of Stuyvesant, Columbia County, New Baltimore, Greene County, and Schodack, Rennselaer County, New York: A Preliminary Phase I Cultural Resources Assessment.

Hutchinson, Diane L.
2015 History of Schodack Islands. http://friendsofschodackisland.org/history-of-the-schodack-islands, Accessed on February 10, 2015.

Laberge Group
2011 Town of Schodack Comprehensive Plan. https://www.schodack.org

Lathrop, J.M.
1903 Atlas of Orange County, New York. A.H. Mueller & Company. Philadelphia, PA.

Lawrence, Dawn, and Gade, Susan (Landmark Archaeology, Inc.)
2013 Phase IB Archaeological Investigations of a Proposed New Campground Facility at Schodack Island State Park Town of Schodack, Rensselaer County, New York.

Mack, Karen and Jennifer Larlee
2017 Phase IA Archaeological Assessment of the Landau Solar, LLC Project, Town of Eddyville, Ulster County, New York.
2018 Phase I Archaeological Assessment of the Landau Solar, LLC Project, East of State Route 32 & West of State Route 213, Town of Ulster, Ulster County, New York.

Miller, Daniel E., Edward Samanns, and Erik Kiviat
2017 Natural Resource Inventory and Assessment of Conservation Priorities of the Binnen Kill and its Tidal Habitats, Towns of Bethlehem and Selkirk, NY. Prepared for the Department of Environmental Conservation and the New England Interstate Water Pollution Control Commission.

Miller, Daniel E.
2013 Hudson River Estuary Habitat Restoration Plan. New York State Department of Environmental Conservation, Hudson River Estuary Program.

Moyer, Rebecca, and David Moyer
2003 Phase IA/IB Cultural Resources Survey, Kingston Rhinecliff Bulkhead, Ramp and Access Road, Town of Kingston, Ulster County, New York. On file, NYSOPRHP.

National Audubon Society
2018 Important Bird Areas: New York [webpage]. Accessed 15 Aug. 2018. www.audubon.org/important-bird-areas/state/new-york

New York State Department of Environmental Conservation
2011 – 2012 New York State Department of Environmental Conservation (NYSDEC) LiDAR: Coastal New York (Long Island and along the Hudson River) [dataset]. NOAA Office for Coastal Management. https://inport.nmfs.noaa.gov/inport/item/49888.

New York State Department of State (NYSDOS)
1995 Town of Schodack and Village of Castleton-on-Hudson Local Waterfront Revitalization Program. Approved: March 17, 1995NYSDOS.
2012a Coastal Fish and Wildlife Rating Form, Shad and Schermerhorn Islands. Designated: November 15, 1987. Revised: August 15, 2012.

2012b Coastal Fish and Wildlife Rating Form, Rondout Creek. Designated: November 15, 1987. Revised: August 15, 2012.
2012c Coastal Fish and Wildlife Rating Form, Schodack and Houghtailing Islands and Schodack Creek. Designated: November 15, 1987. Revised: August 15, 2012.
2012d Coastal Fish and Wildlife Rating Form, The Flats. Designated: November 15, 1987. Revised: August 15, 2012.

New York State Department of Transportation
2013 Geology of New York State. Geotechnical Design Manual. 3-1-3-35.

New York State Museum
1991 Surficial Geologic Map of New York. http://www.nysm.nysed.gov/research-collections/geology/gis
1995 Geologic Map of New York. http://www.nysm.nysed.gov/research-collections/geology/gis

Oberon, Stephen J.
2006 Phase I Cultural Resources survey Site Assessment and site Identification Phase Proposed Cornwall Commons Development, Town of Cornwall, Orange County, New York. Columbia Heritage, Ltd.

Ocean and Coastal Consultants
2011 Henry Hudson Shoreline Stabilization Study: Research and Recommendations.

Office of Parks Recreation and Historic Preservation
2018 Various site files within 1.6-kilometer (1-mile) radius of project area. On file, Office of Parks Recreation and Historic Preservation, Peebles Island, Waterford, NY. Available at https://cris.parks.ny.gov. Accessed January 2018.

Panamerican Consultants, Inc.
2002 Cultural Resources Investigation and Remote Sensing Survey of the Hudson River at Athens Navigation Project, Athens, Greene County, New York. Prepared for the U.S. Army Corps of Engineers, New York District.

Rink, Oliver A.
1986 Holland on the Hudson: An Economic and Social History of Dutch New York. Ithaca, New York: Cornell University Press. pp. 17–23, 264–266.

Ritchie, William A.
1994 The Archaeology of New York State, revised edition. Purple Mountain Press, Fleischmanns, New York.

Sandy, William and Faline Schneiderman
2017 Phase IB Archaeological Investigation, Catskill Aqueduct Connection, Phase II Transmission Line, Towns of Cornwall and New Windsor, Orange County, New York. Historical Perspectives, Inc.

Schodack Scene

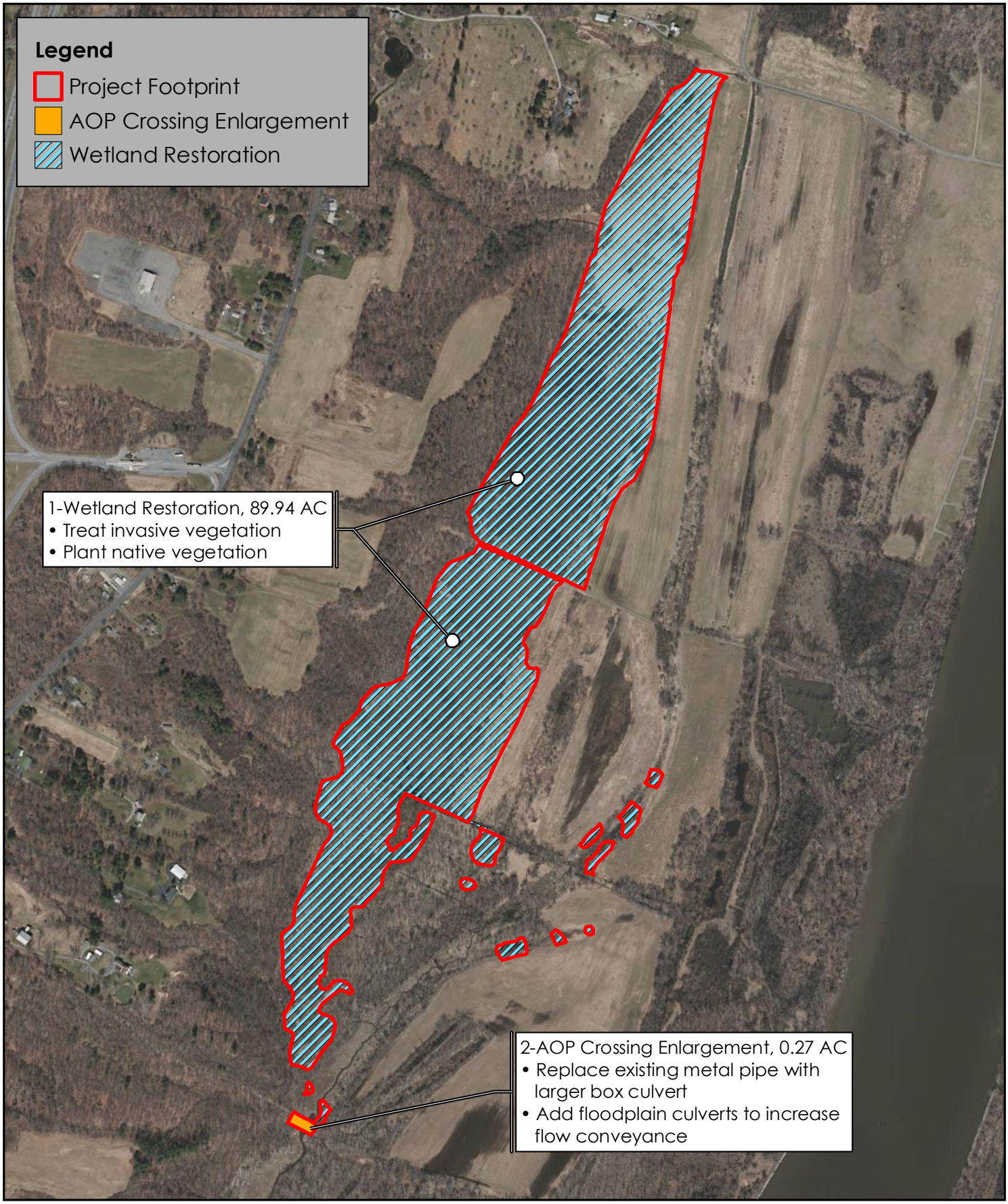
2015 Schodack Island to Host Winterfest [Webpage]. Accessed December 2018. https://thescene-thescene.blogspot.com/search?q=schodack+island.

Stanne, Stephen P.
1996 The Hudson: An Illustrated Guide to the Living River, p. 120. Rutgers University Press.

Stone and Stewart
1866 Map of Bethlehem from the New Topographical Atlas of Albany and Schenectady, New York. Philadelphia, PA.

U.S. Army Corps of Engineers, New York District
2014 U.S. Army Corps of Engineers awards $8.6 million maintenance dredging contract for work along Hudson River. https://www.nan.usace.army.mil/
2019 Aquatic Organisms Passage Barrier Literature Review for Moodna Creek and Rondout Creek. Hudson River Habitat Restoration Feasibility Study, Orange and Uster Counties, New York.

Appendix A – Restoration Site Alternatives



File: P:\1450\Projects\1450018\GIS\MXD\Binnen_Kill\Concept_Plans\BK_Concept_Plan_North_Alt1.mxd, 2/22/2019, Drawn by cpollack, Copyright Princeton Hydro, LLC.

NOTES:
1. 2017 orthoimagery obtained from the New York State GIS Clearinghouse: gis.ny.gov

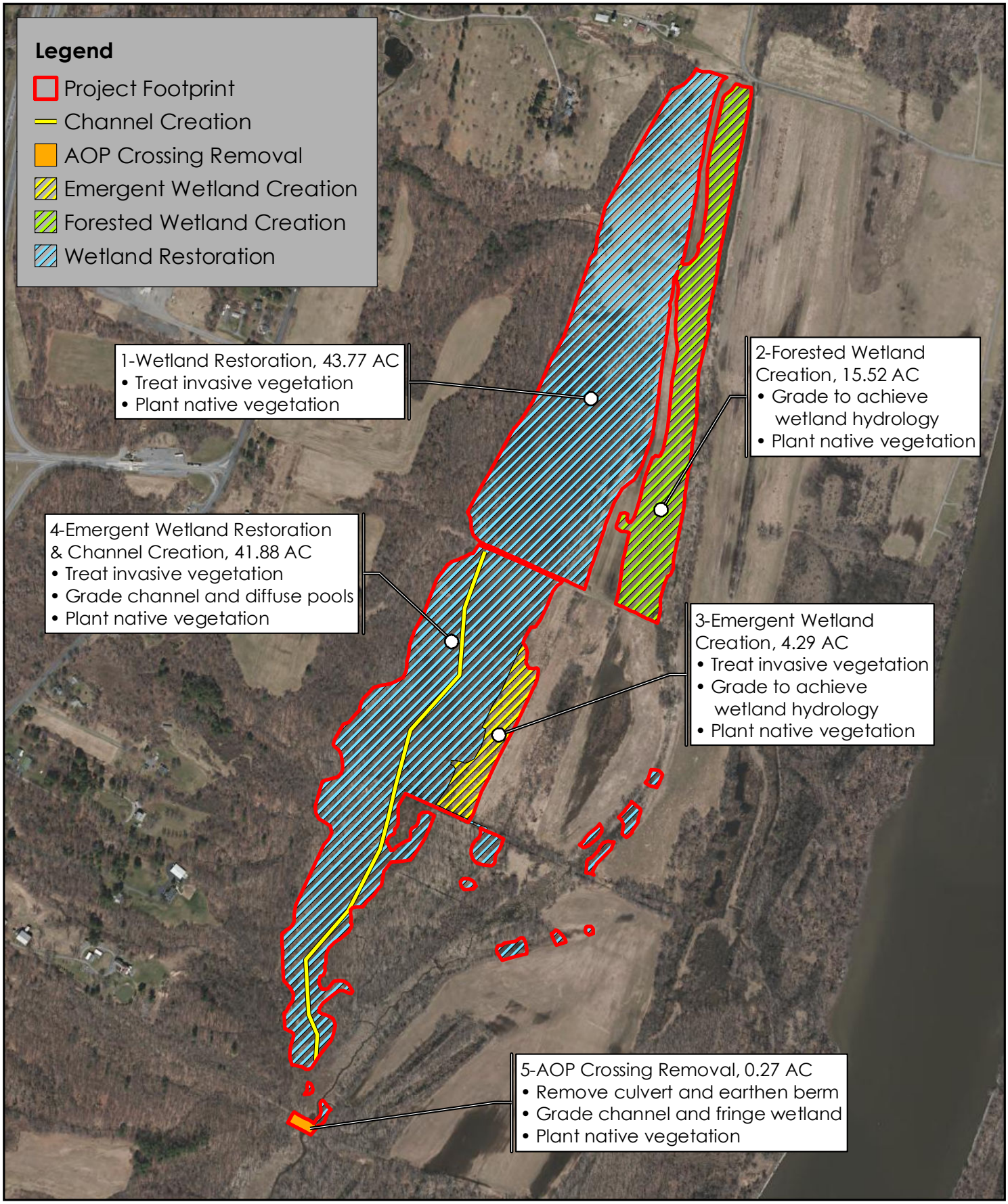
0 400 800 Feet

Map Projection: NAD 1983 StatePlane New York East FIPS 3101 Feet

CONCEPT PLAN
NORTH - ALTERNATIVE 1

HUDSON RIVER HABITAT RESTORATION
BINNEN KILL
TOWNS OF BETHLEHEM AND COEYMANS
ALBANY COUNTY, NEW YORK

US Army Corps of Engineers®
New York District



File: P:\1450\Projects\1450018\GIS\MXD\Binnen_Kill\Concept_Plans\BK_Concept_Plan_North_Alt2.mxd, 2/22/2019, Drawn by cpollack, Copyright Princeton Hydro, LLC.

NOTES:
1. 2017 orthoimagery obtained from the New York State GIS Clearinghouse: gis.ny.gov

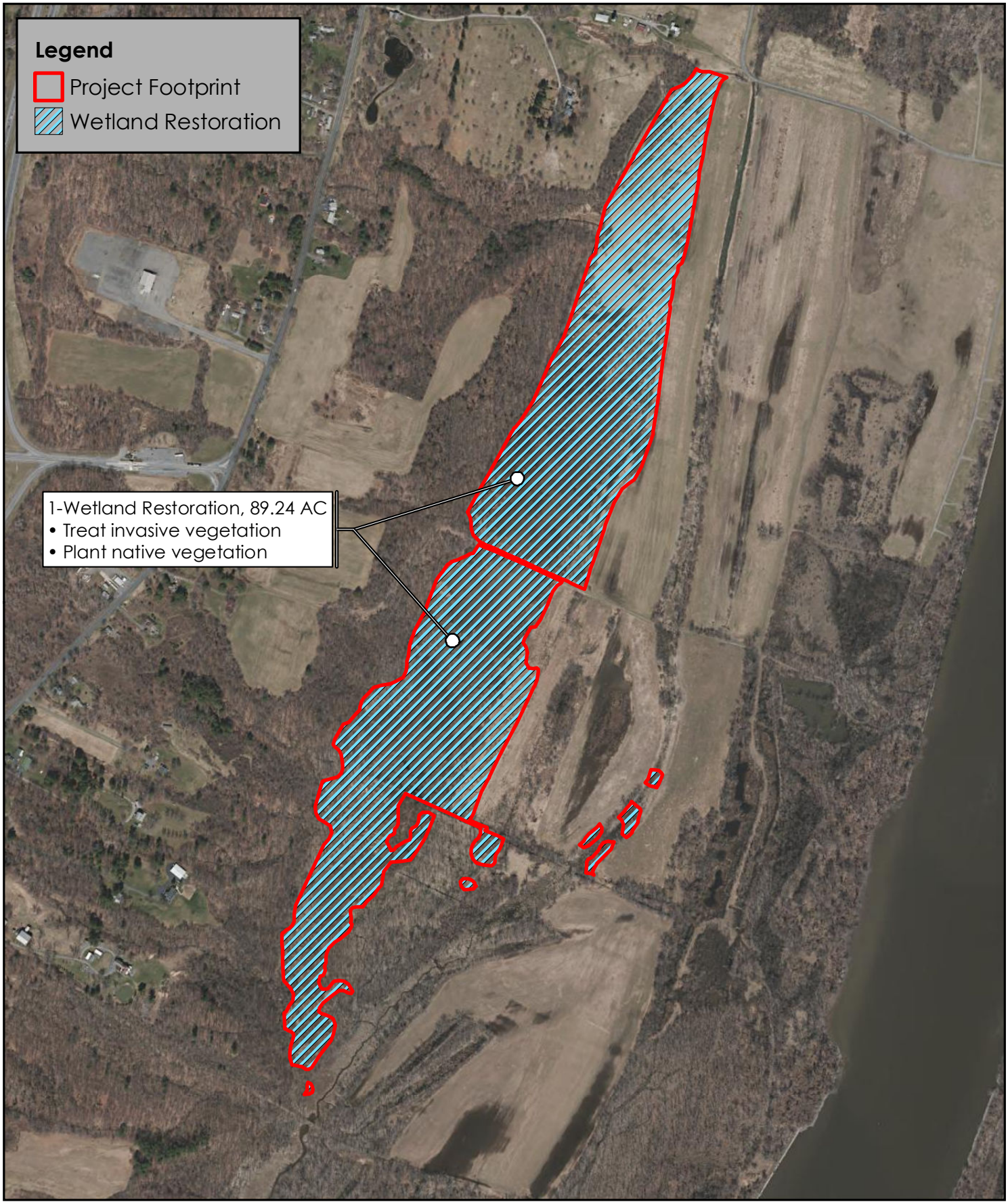
0 400 800 Feet

Map Projection: NAD 1983 StatePlane New York East FIPS 3101 Feet

CONCEPT PLAN
NORTH - ALTERNATIVE 2

HUDSON RIVER HABITAT RESTORATION
BINNEN KILL
TOWNS OF BETHLEHEM AND COEYMANS
ALBANY COUNTY, NEW YORK

US Army Corps of Engineers®
New York District



File: P:\1450\Projects\1450018\GIS\MXD\Binnen_Kill\Concept_Plans\BK_Concept_Plan_North_Alt3.mxd, 2/22/2019, Drawn by cpollack, Copyright Princeton Hydro, LLC.

NOTES:
1. 2017 orthoimagery obtained from the New York State GIS Clearinghouse: gis.ny.gov

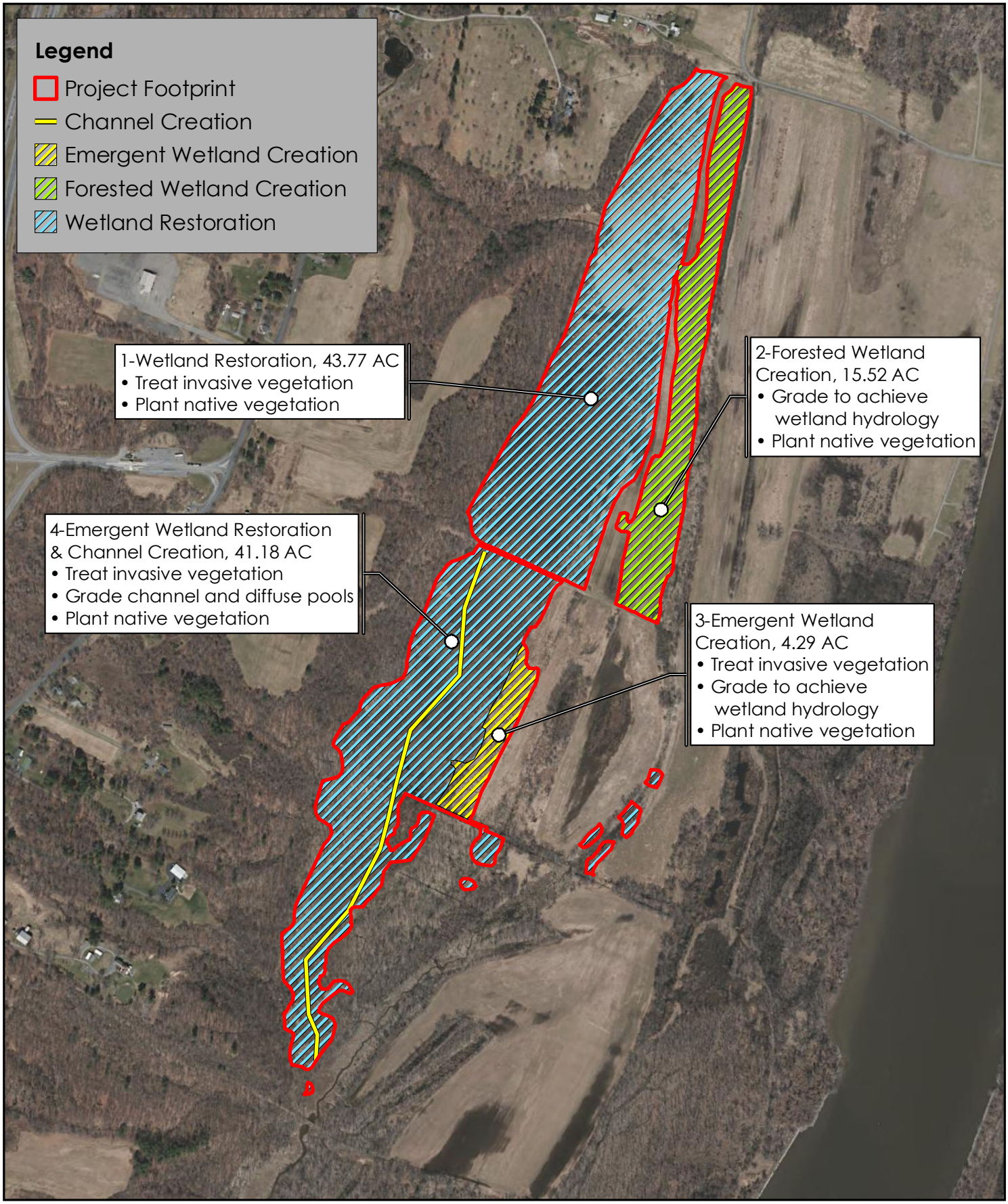
0 400 800 Feet

Map Projection: NAD 1983 StatePlane New York East FIPS 3101 Feet

CONCEPT PLAN
NORTH - ALTERNATIVE 3

HUDSON RIVER HABITAT RESTORATION
BINNEN KILL
TOWNS OF BETHLEHEM AND COEYMANS
ALBANY COUNTY, NEW YORK

US Army Corps of Engineers®
New York District



File: P:\1450\Projects\1450018\GIS\MXD\Binnen_Kill\Concept_Plans\BK_Concept_Plan_North_Alt4.mxd, 2/22/2019, Drawn by cpollack, Copyright Princeton Hydro, LLC.

NOTES:
1. 2017 orthoimagery obtained from the New York State GIS Clearinghouse: gis.ny.gov

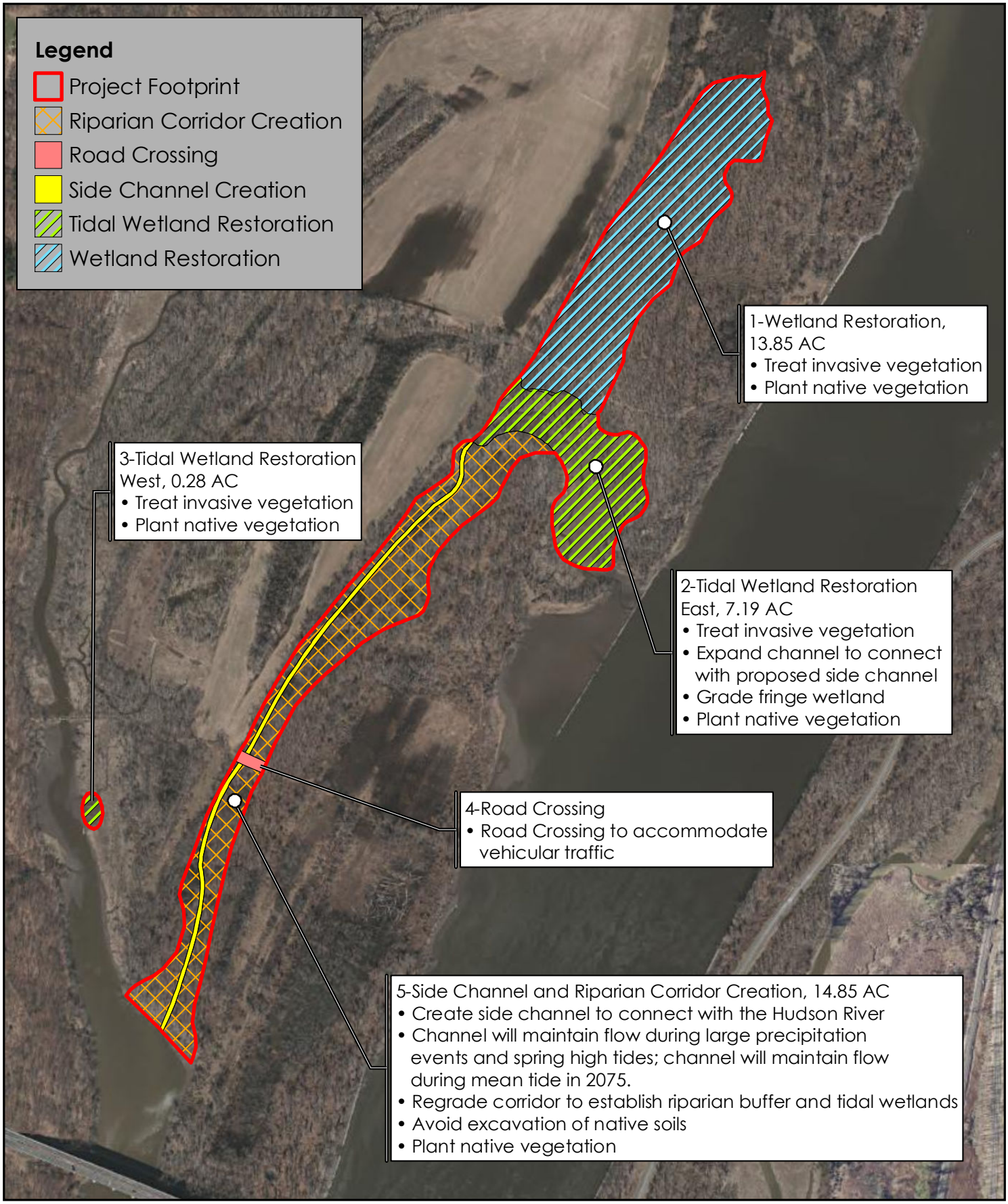
0 400 800 Feet

Map Projection: NAD 1983 StatePlane New York East FIPS 3101 Feet

CONCEPT PLAN
NORTH - ALTERNATIVE 4

HUDSON RIVER HABITAT RESTORATION
BINNEN KILL
TOWNS OF BETHLEHEM AND COEYMANS
ALBANY COUNTY, NEW YORK

US Army Corps of Engineers®
New York District



File: P:\1450\Projects\1450018\GIS\MXD\Binnen_Kill\Concept_Plans\BK_Concept_Plan_South_Alt1.mxd, 2/22/2019, Drawn by cpollack, Copyright Princeton Hydro, LLC.

NOTES:
1. 2017 orthoimagery obtained from the New York State GIS Clearinghouse: gis.ny.gov

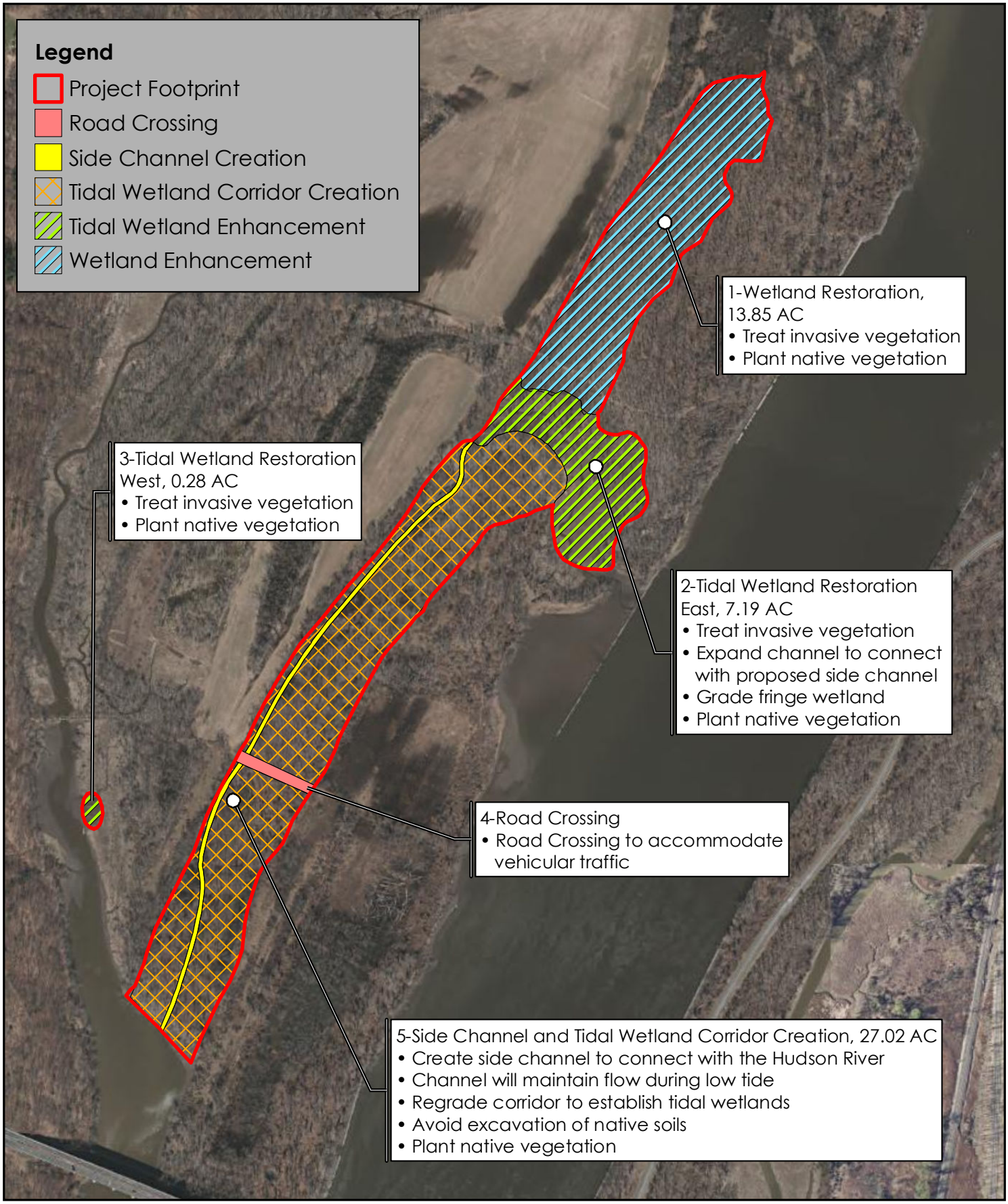
0 300 600 Feet

Map Projection: NAD 1983 StatePlane New York East FIPS 3101 Feet

CONCEPT PLAN
SOUTH - ALTERNATIVE 1

HUDSON RIVER HABITAT RESTORATION
BINNEN KILL
TOWNS OF BETHLEHEM AND COEYMANS
ALBANY COUNTY, NEW YORK

US Army Corps of Engineers®
New York District



File: P:\1450\Projects\1450018\GIS\MXD\Binnen_Kill\Concept_Plans\BK_Concept_Plan_South_Alt2.mxd, 2/22/2019, Drawn by cpollack, Copyright Princeton Hydro, LLC.

NOTES:
1. 2017 orthoimagery obtained from the New York State GIS Clearinghouse: gis.ny.gov

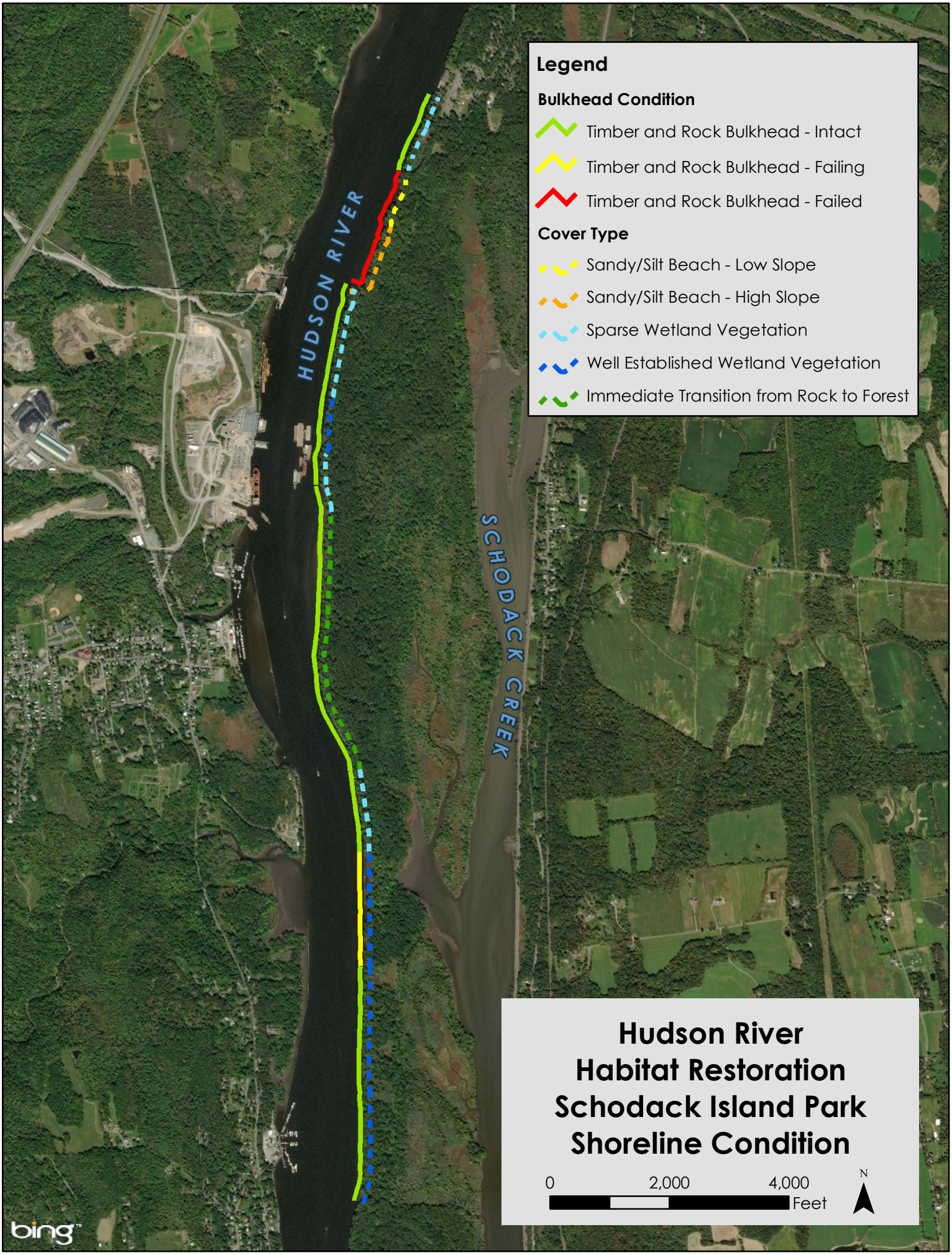
0 300 600 Feet

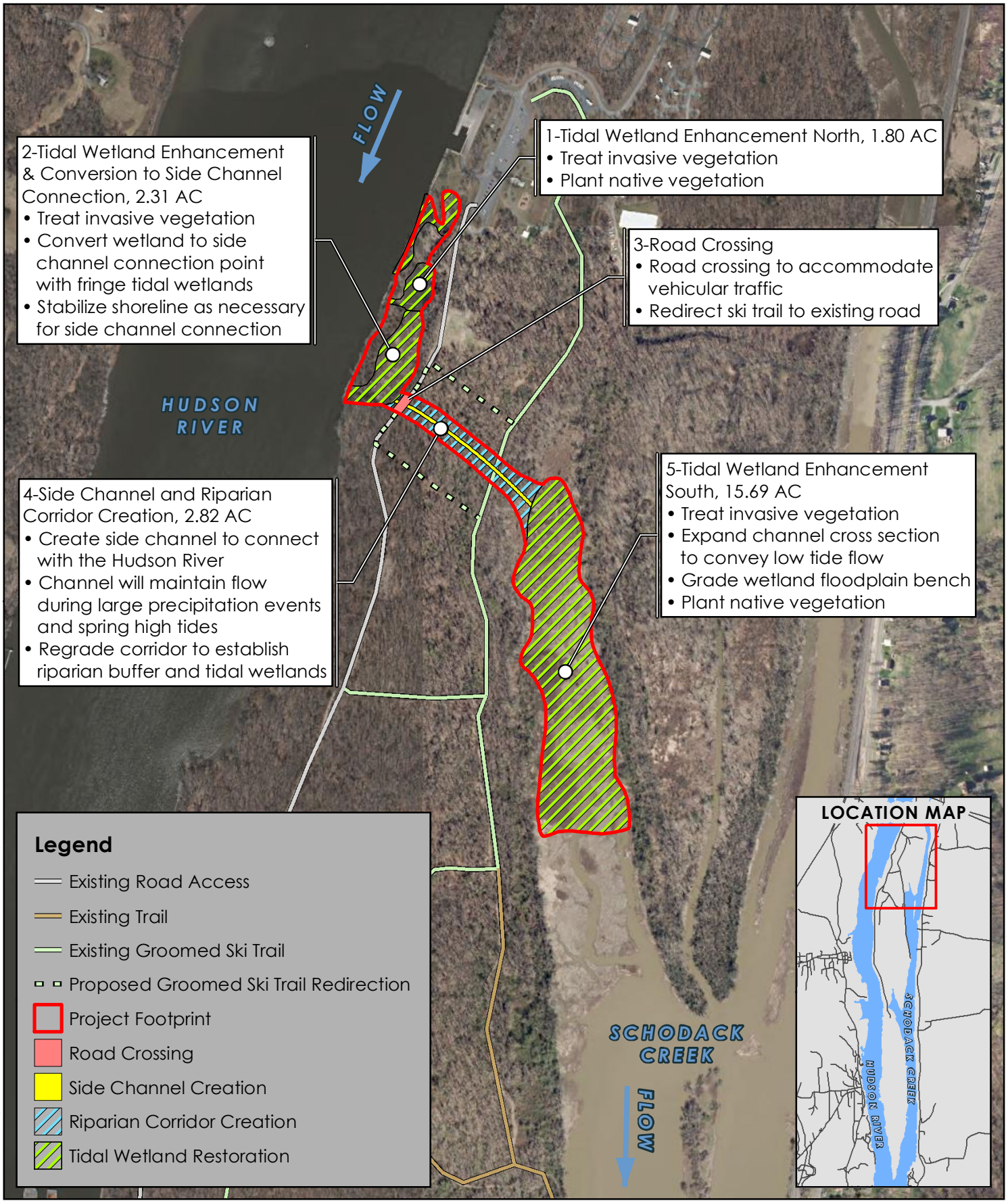
Map Projection: NAD 1983 StatePlane New York East FIPS 3101 Feet

CONCEPT PLAN
SOUTH - ALTERNATIVE 2

HUDSON RIVER HABITAT RESTORATION
BINNEN KILL
TOWNS OF BETHLEHEM AND COEYMANS
ALBANY COUNTY, NEW YORK

US Army Corps of Engineers®
New York District


Legend
Bulkhead Condition
Timber and Rock Bulkhead - Intact
Timber and Rock Bulkhead - Failing
Timber and Rock Bulkhead - Failed
Cover Type
Sandy/Silt Beach - Low Slope
Sandy/Silt Beach - High Slope
Sparse Wetland Vegetation
Well Established Wetland Vegetation
Immediate Transition from Rock to Forest
HUDSON RIVER
SCHODACK CREEK
Hudson River
Habitat Restoration
Schodack Island Park
Shoreline Condition
0
2,000
4,000
Feet
N
bing



File: P:\1450\Projects\1450018\GIS\MXD\Schodack_Island\Concept_Plans\SI_Concept_Plan_North_Alt1.mxd, 12/11/2018. Drawn by thopper. Copyright Princeton Hydro, LLC.

NOTES:
1. 2017 orthoimagery obtained from the New York State GIS Clearinghouse: gis.ny.gov

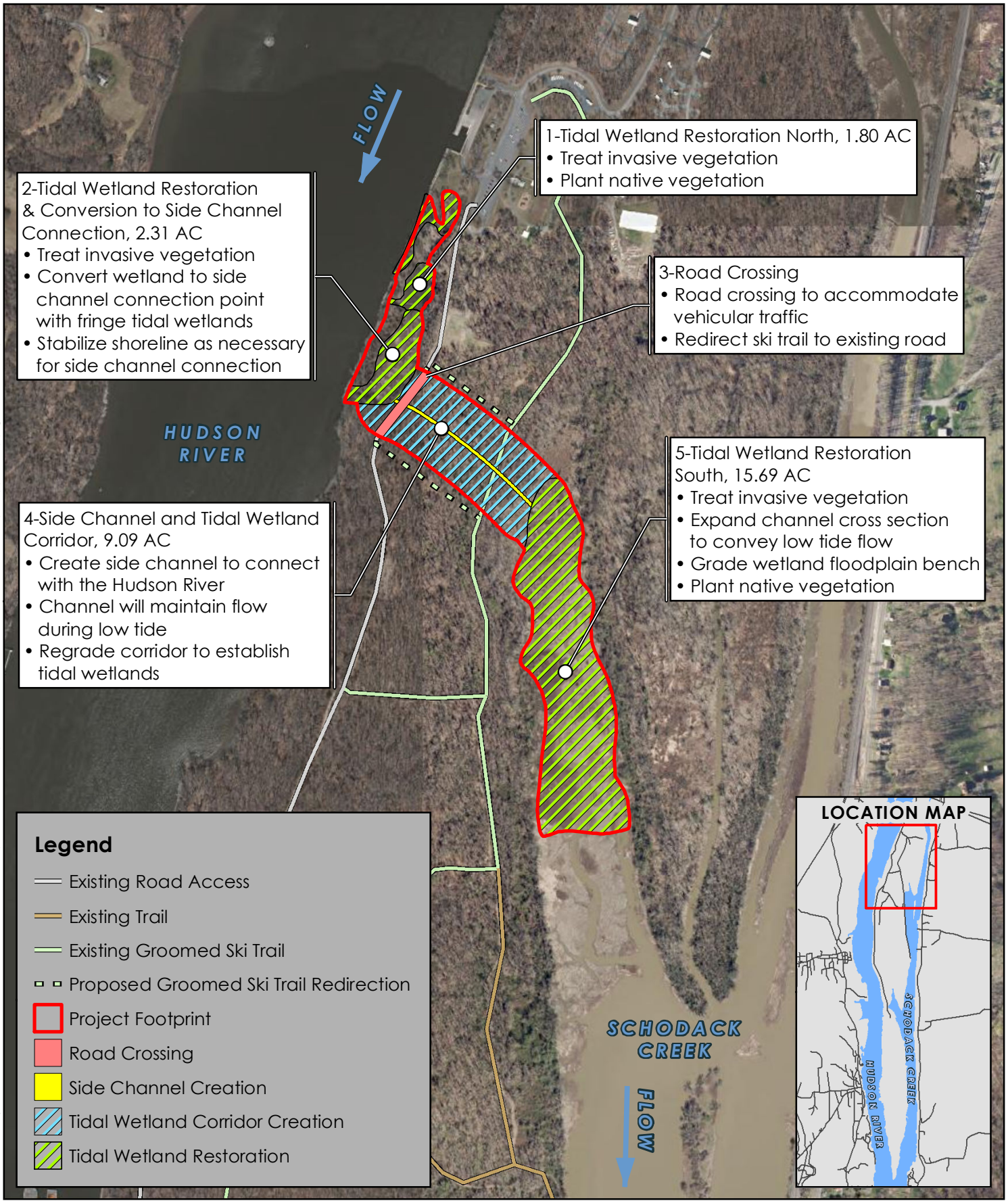
0 350 700 Feet

Map Projection: NAD 1983 StatePlane New York East FIPS 3101 Feet

CONCEPT PLAN
NORTH - ALTERNATIVE 1

HUDSON RIVER HABITAT RESTORATION
SCHODACK ISLAND
TOWNS OF SCHODACK, NEW BALTIMORE, AND STUYVESANT
RENSSELAER, GREENE, AND COLUMBIA COUNTIES, NEW YORK

US Army Corps of Engineers®
New York District



File: P:\1450\Projects\1450018\GIS\MXD\Schodack_Island\Concept_Plans\SI_Concept_Plan_North_Alt2.mxd, 1/22/2019, Drawn by thopper, Copyright Princeton Hydro, LLC.

NOTES:
1. 2017 orthoimagery obtained from the New York State GIS Clearinghouse: gis.ny.gov

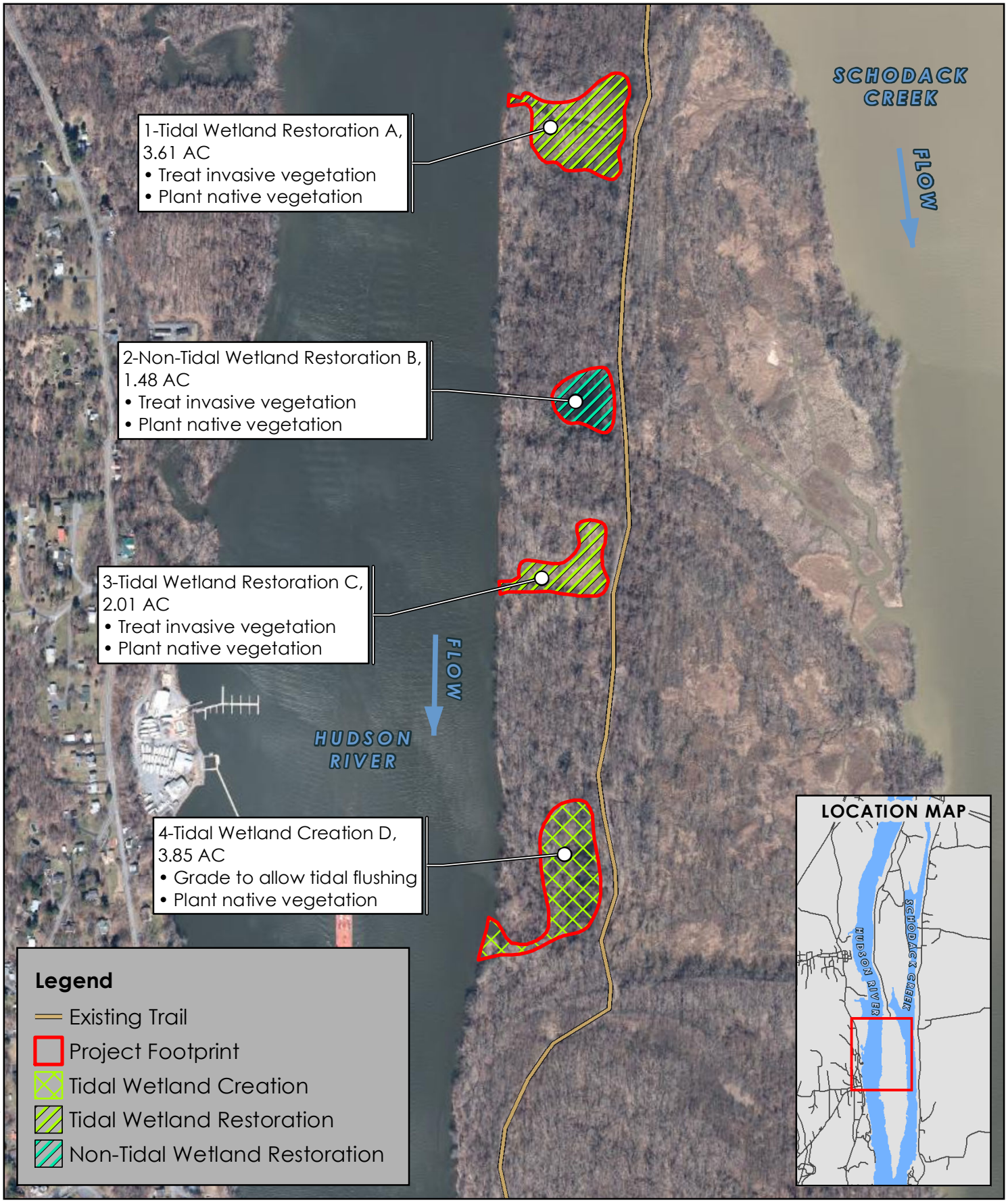
0 350 700 Feet

Map Projection: NAD 1983 StatePlane New York East FIPS 3101 Feet

CONCEPT PLAN
NORTH - ALTERNATIVE 2

HUDSON RIVER HABITAT RESTORATION
SCHODACK ISLAND
TOWNS OF SCHODACK, NEW BALTIMORE, AND STUYVESANT
RENSSELAER, GREENE, AND COLUMBIA COUNTIES, NEW YORK

US Army Corps of Engineers®
New York District



File: P:\1450\Projects\1450018\GIS\MXD\Schodack_Island\Concept_Plans\SI_Concept_Plan_PocketWetland_Alt1.mxd, 1/22/2019, Drawn by thopper, Copyright Princeton Hydro, LLC.

NOTES:
1. 2016 orthoimagery obtained from the New York State GIS Clearinghouse: gis.ny.gov

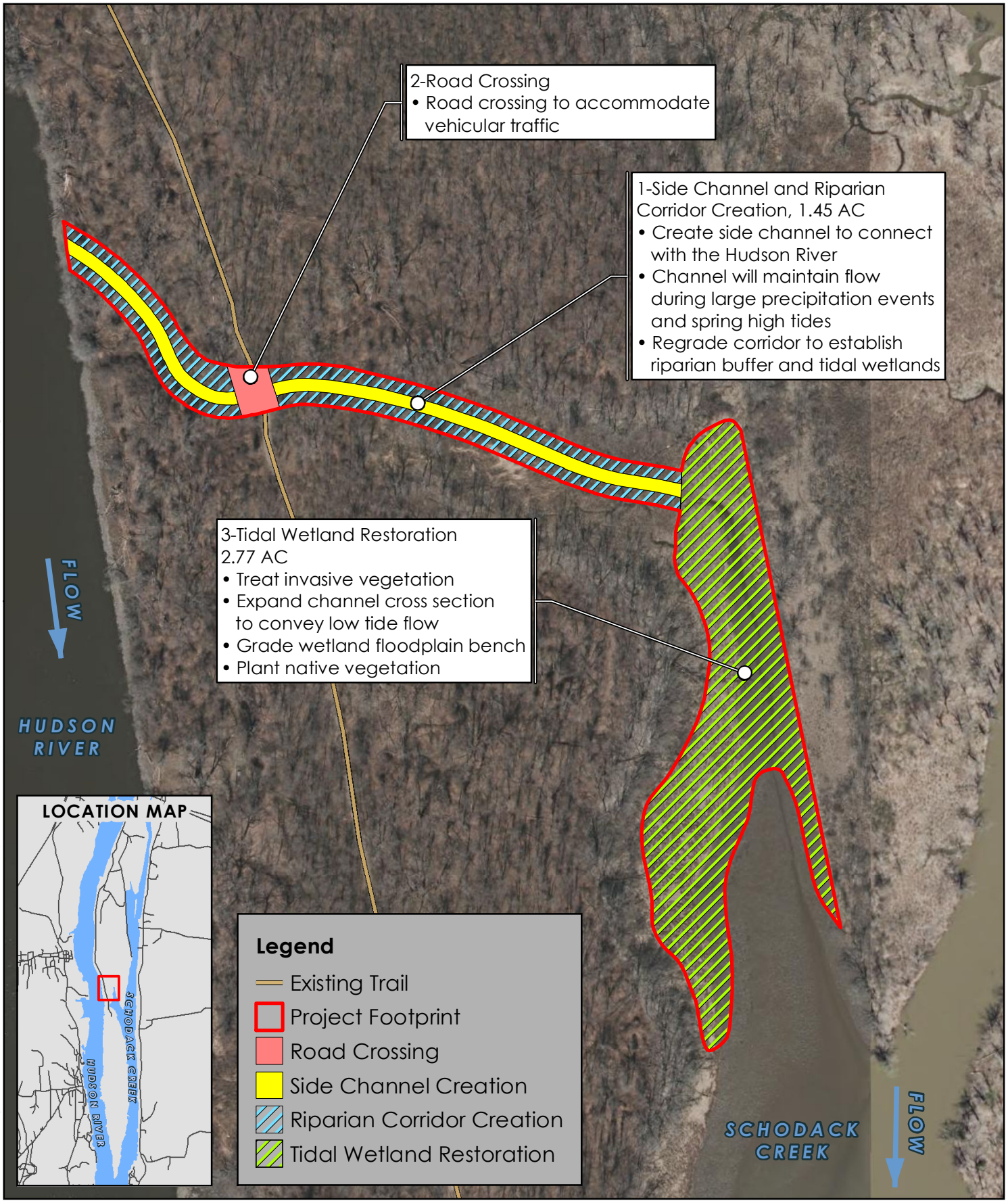
0 300 600 Feet

Map Projection: NAD 1983 StatePlane New York East FIPS 3101 Feet

CONCEPT PLAN
POCKET WETLAND - ALTERNATIVE 1

HUDSON RIVER HABITAT RESTORATION
SCHODACK ISLAND
TOWNS OF SCHODACK, NEW BALTIMORE, AND STUYVESANT
RENSSELAER, GREENE, AND COLUMBIA COUNTIES, NEW YORK

US Army Corps of Engineers®
New York District



File: P:\1450\Projects\1450018\GIS\MXD\Schodack_Island\Concept_Plans\SI_Concept_Plan_South_Alt1.mxd, 1/22/2019. Drawn by thopper. Copyright Princeton Hydro, LLC.

NOTES:
1. 2017 orthoimagery obtained from the New York State GIS Clearinghouse: gis.ny.gov

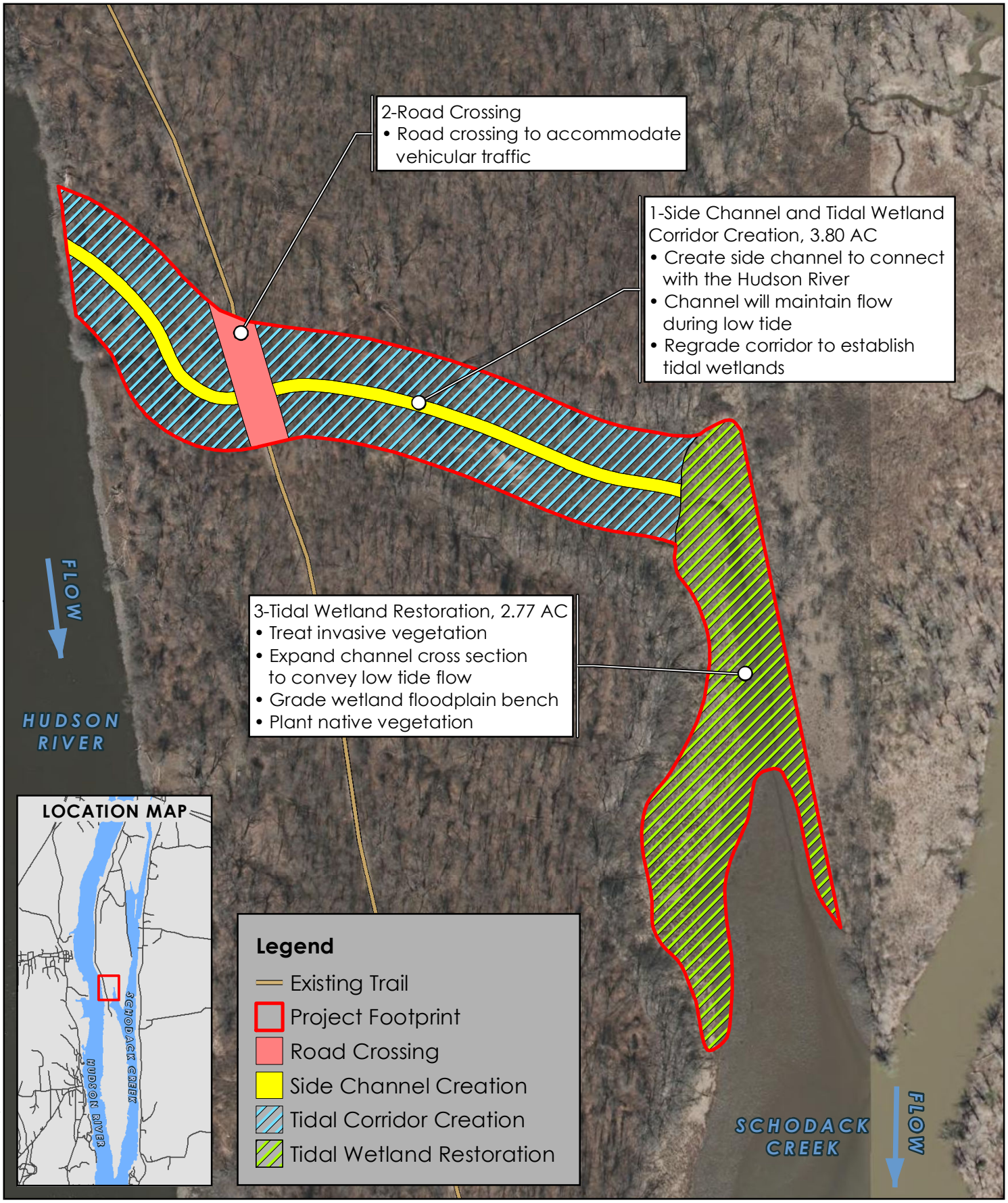
0 100 200 Feet

Map Projection: NAD 1983 StatePlane New York East FIPS 3101 Feet

CONCEPT PLAN
SOUTH - ALTERNATIVE 1

HUDSON RIVER HABITAT RESTORATION
SCHODACK ISLAND
TOWNS OF SCHODACK, NEW BALTIMORE, AND STUYVESANT
RENSSELAER, GREENE, AND COLUMBIA COUNTIES, NEW YORK

US Army Corps of Engineers®
New York District



File: P:\1450\Projects\1450018\GIS\MXD\Schodack_Island\Concept_Plans\SI_Concept_Plan_South_Alt2.mxd, 12/11/2018, Drawn by thopper, Copyright Princeton Hydro, LLC.

NOTES:
1. 2017 orthoimagery obtained from the New York State GIS Clearinghouse: gis.ny.gov

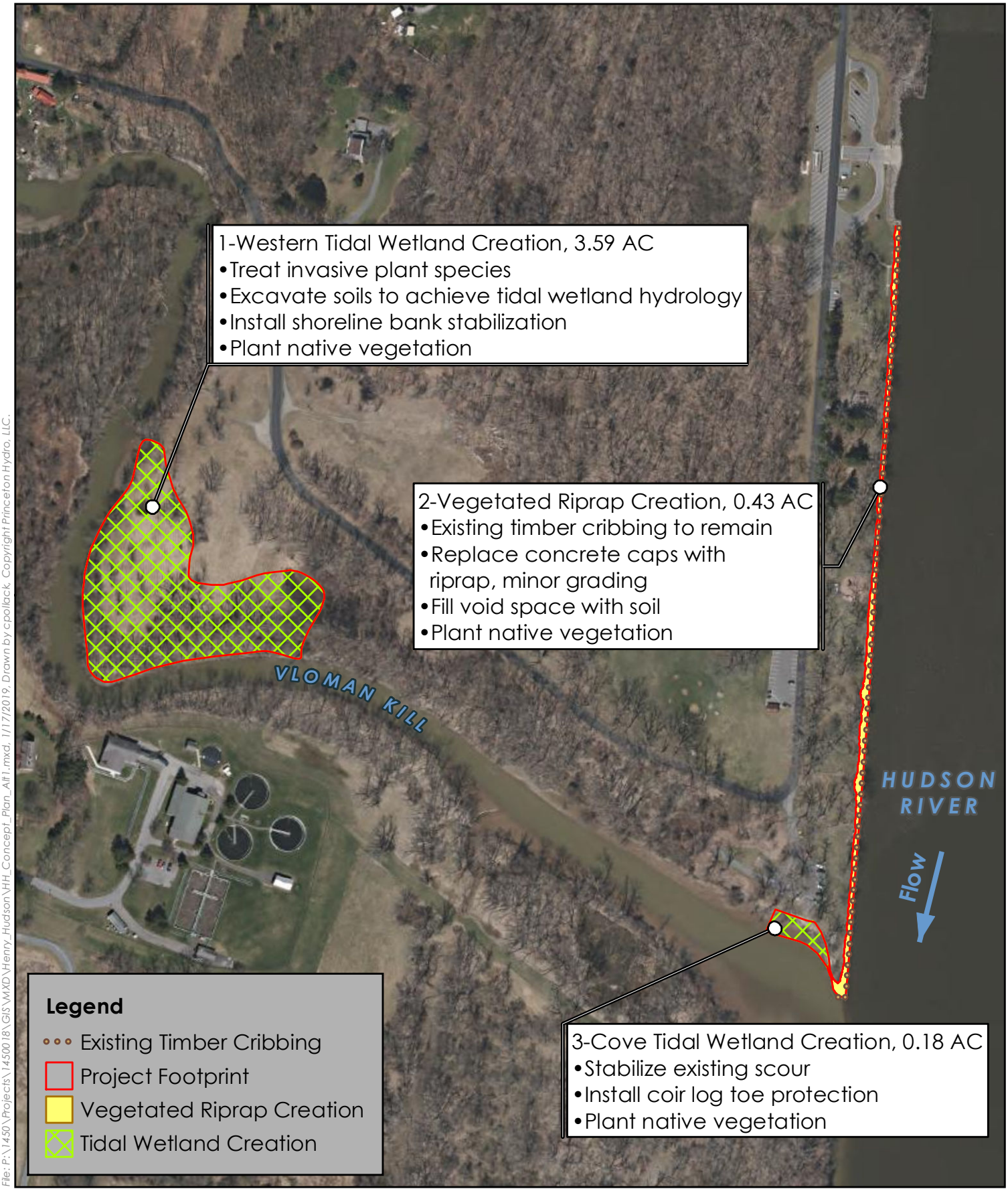
0 100 200 Feet

Map Projection: NAD 1983 StatePlane New York East FIPS 3101 Feet

CONCEPT PLAN
SOUTH - ALTERNATIVE 2

HUDSON RIVER HABITAT RESTORATION
SCHODACK ISLAND
TOWNS OF SCHODACK, NEW BALTIMORE, AND STUYVESANT
RENSSELAER, GREENE, AND COLUMBIA COUNTIES, NEW YORK

US Army Corps of Engineers®
New York District



File: P:\1450\Projects\1450018\GIS\MXD\Henry_Hudson\HH_Concept_Plan_Alt1.mxd, 1/17/2019, Drawn by cpollack, Copyright Princeton Hydro, LLC.

NOTES:
1. 2017 orthoimagery obtained from the New York State GIS Clearinghouse: gis.ny.gov

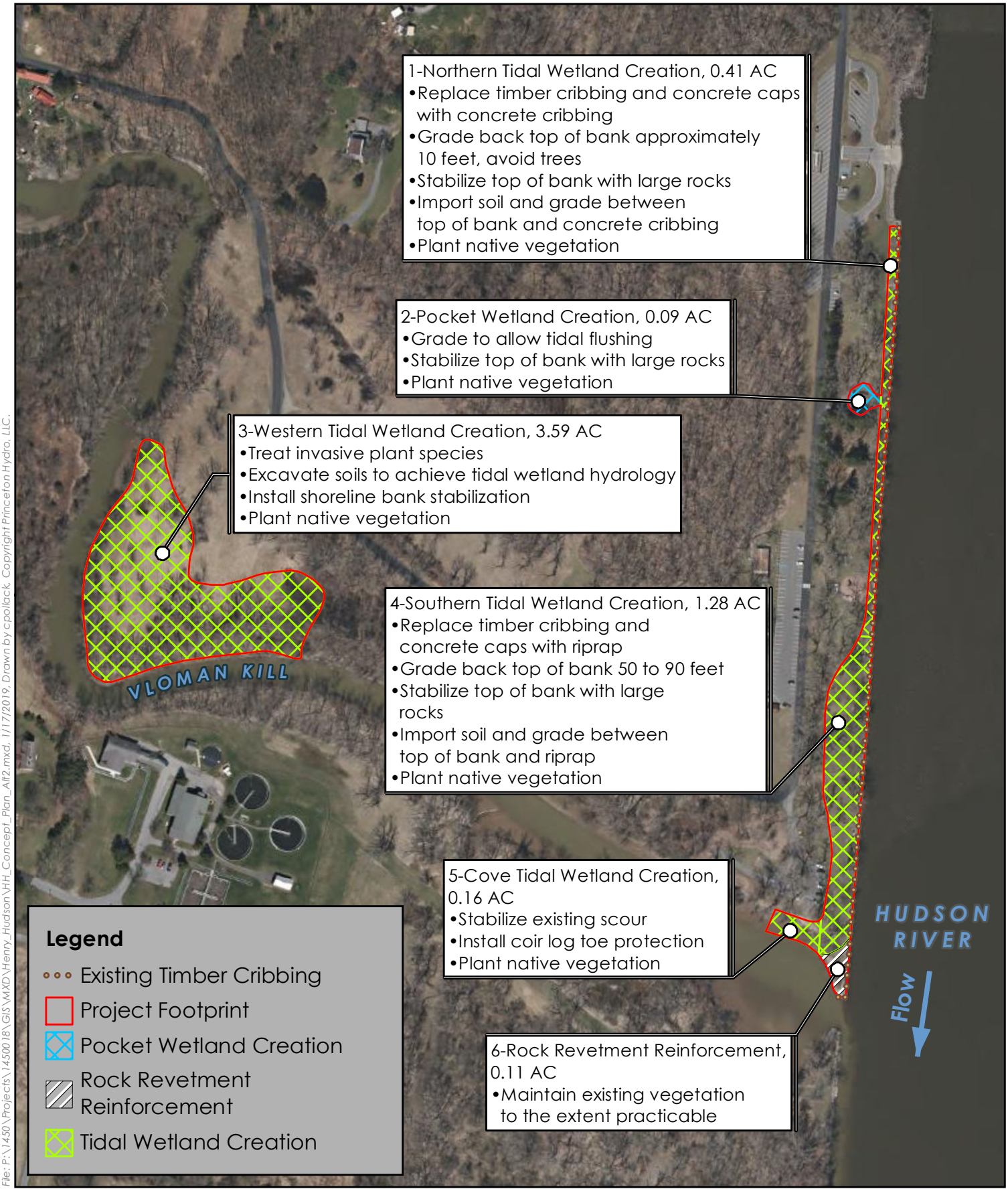
0 150 300 Feet

Map Projection: NAD 1983 StatePlane New York East FIPS 3101 Feet

CONCEPT PLAN
ALTERNATIVE 1

HUDSON RIVER HABITAT RESTORATION
HENRY HUDSON PARK
TOWN OF BETHLEHEM
ALBANY COUNTY, NEW YORK

US Army Corps of Engineers®
New York District



File: P:\1450\Projects\1450018\GIS\MXD\Henry_Hudson\HH_Concept_Plan_Alt2.mxd, 1/17/2019, Drawn by cpollack, Copyright Princeton Hydro, LLC.

NOTES:
1. 2017 orthoimagery obtained from the New York State GIS Clearinghouse: gis.ny.gov

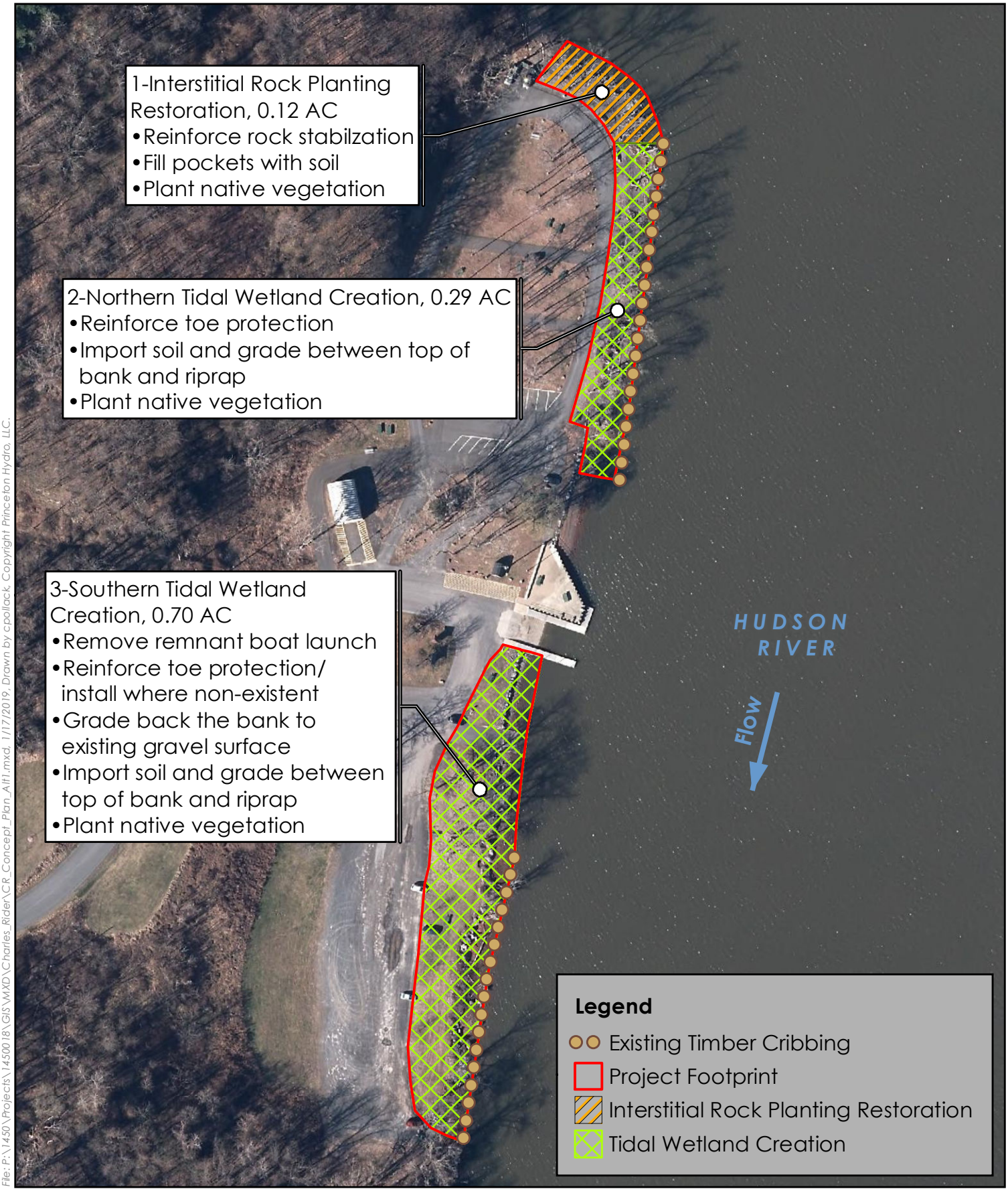
0 150 300 Feet

Map Projection: NAD 1983 StatePlane New York East FIPS 3101 Feet

CONCEPT PLAN
ALTERNATIVE 2

HUDSON RIVER HABITAT RESTORATION
HENRY HUDSON PARK
TOWN OF BETHLEHEM
ALBANY COUNTY, NEW YORK

US Army Corps of Engineers®
New York District



File: P:\1450\Projects\1450018\GIS\MXD\Charles_Rider\CR_Concept_Plan_Alt1.mxd, 1/17/2019, Drawn by cpollack, Copyright Princeton Hydro, LLC.

NOTES:
1. 2016 orthoimagery obtained from the New York State GIS Clearinghouse: gis.ny.gov

0 60 120 Feet

Map Projection: NAD 1983 StatePlane New York East FIPS 3101 Feet

CONCEPT PLAN
ALTERNATIVE 1

HUDSON RIVER HABITAT RESTORATION
CHARLES RIDER PARK
TOWN OF ULSTER
ULSTER COUNTY, NEW YORK

US Army Corps of Engineers
New York District

File: P:\1450\Projects\1450018\GIS\MXD\Moodna_Creek\Concept_Plans\MC_Concept_Plan_UtilityCrossing_Alt1.mxd, 1/21/2019, Drawn by cpollack, Copyright Princeton Hydro, LLC.

NOTES:
1. 2016 orthoimagery obtained from the New York State GIS Clearinghouse: gis.ny.gov

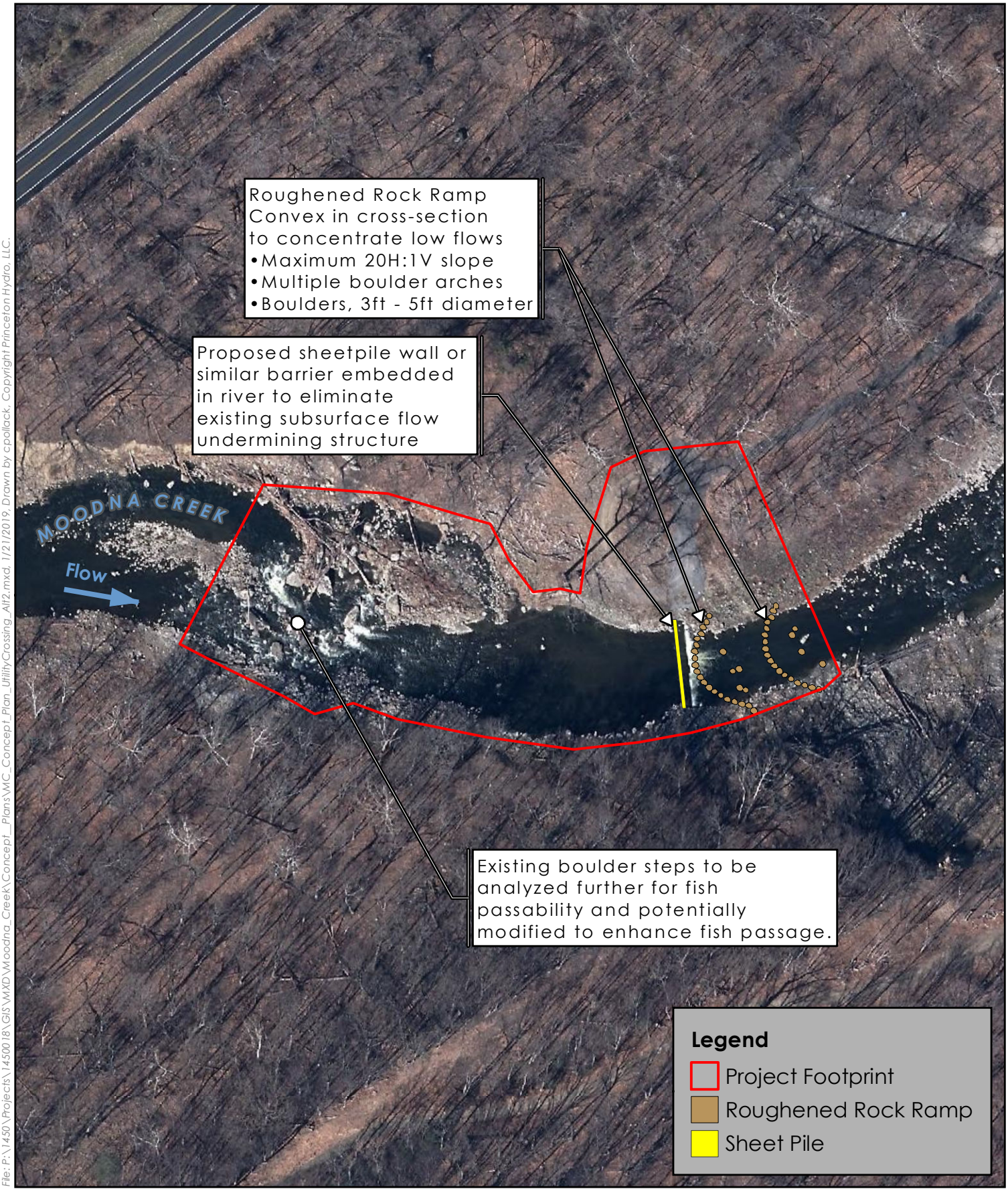
0 50 100 Feet

Map Projection: NAD 1983 StatePlane New York East FIPS 3101 Feet

CONCEPT PLAN
ALTERNATIVE 1

HUDSON RIVER HABITAT RESTORATION
MOODNA CREEK - AOP 1: UTILITY CROSSING
TOWN OF NEW WINDSOR
ORANGE COUNTY, NEW YORK

US Army Corps of Engineers®
New York District



File: P:\1450\Projects\1450018\GIS\MXD\Moodna_Creek\Concept_Plans\MC_Concept_Plan_UtilityCrossing_Alt2.mxd, 1/21/2019, Drawn by cpollack. Copyright Princeton Hydro, LLC.

NOTES:
1. 2016 orthoimagery obtained from the New York State GIS Clearinghouse: gis.ny.gov

0 50 100 Feet

Map Projection: NAD 1983 StatePlane New York East FIPS 3101 Feet

CONCEPT PLAN
ALTERNATIVE 2

HUDSON RIVER HABITAT RESTORATION
MOODNA CREEK - AOP 1: UTILITY CROSSING
TOWN OF NEW WINDSOR
ORANGE COUNTY, NEW YORK

US Army Corps of Engineers®
New York District

File: P:\1450\Projects\1450018\GIS\MXD\Moodna_Creek\Concept_Plans\MC_Concept_Plan_FirthCliff_Alt1.mxd, 1/21/2019, Drawn by cpollack, Copyright Princeton Hydro, LLC.

NOTES:
1. 2016 orthoimagery obtained from the New York State GIS Clearinghouse: gis.ny.gov

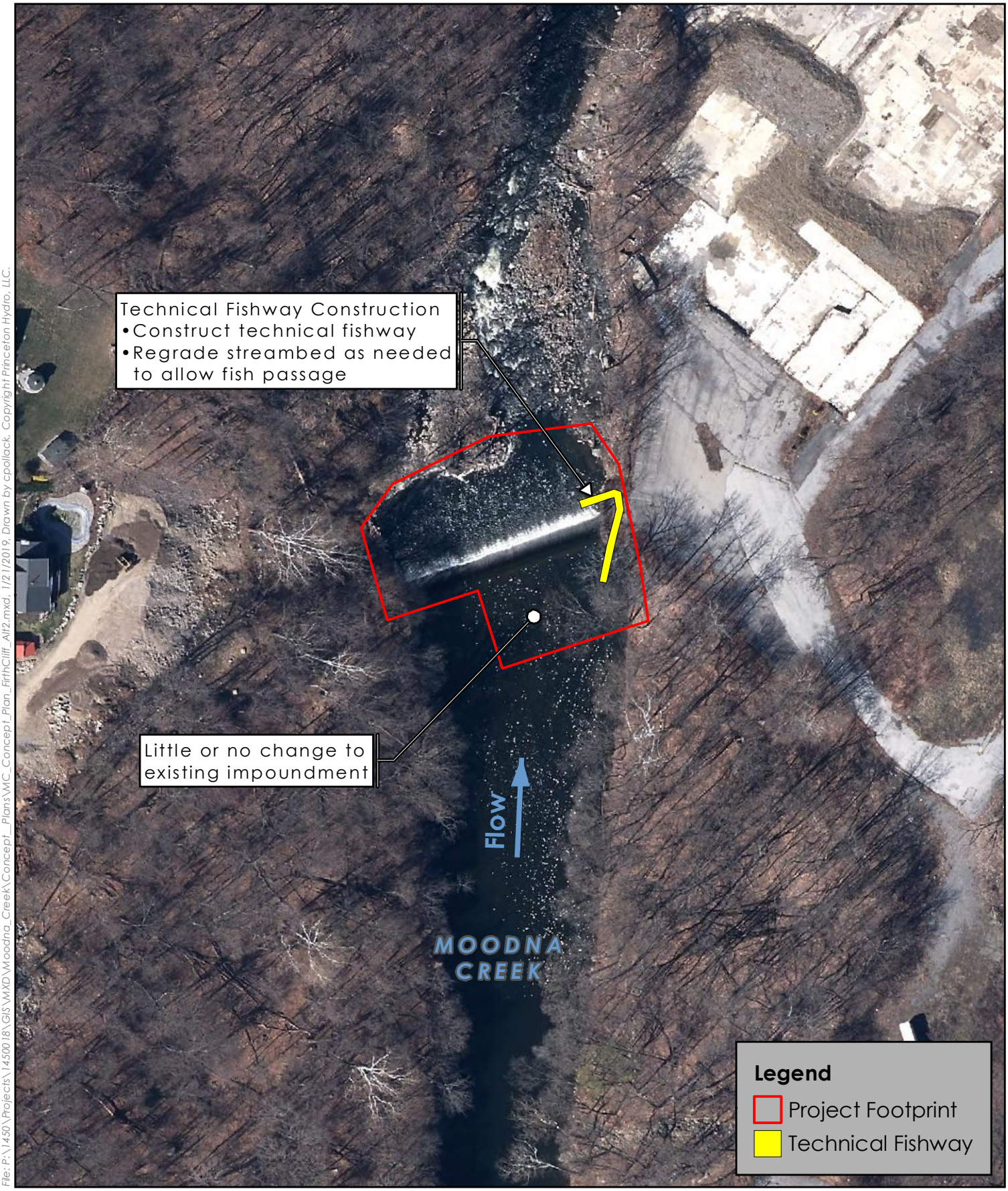
0 50 100 Feet

Map Projection: NAD 1983 StatePlane New York East FIPS 3101 Feet

CONCEPT PLAN
ALTERNATIVE 1

HUDSON RIVER HABITAT RESTORATION
MOODNA CREEK - AOP 2: FIRTH CLIFF DAM
TOWN OF CORNWALL
ORANGE COUNTY, NEW YORK

US Army Corps of Engineers®
New York District



File: P:\1450\Projects\1450018\GIS\MXD\Moodna_Creek\Concept_Plans\MC_Concept_Plan_FirthCliff_Alt2.mxd, 1/21/2019, Drawn by cpollack, Copyright Princeton Hydro, LLC.

NOTES:
1. 2016 orthoimagery obtained from the New York State GIS Clearinghouse: gis.ny.gov

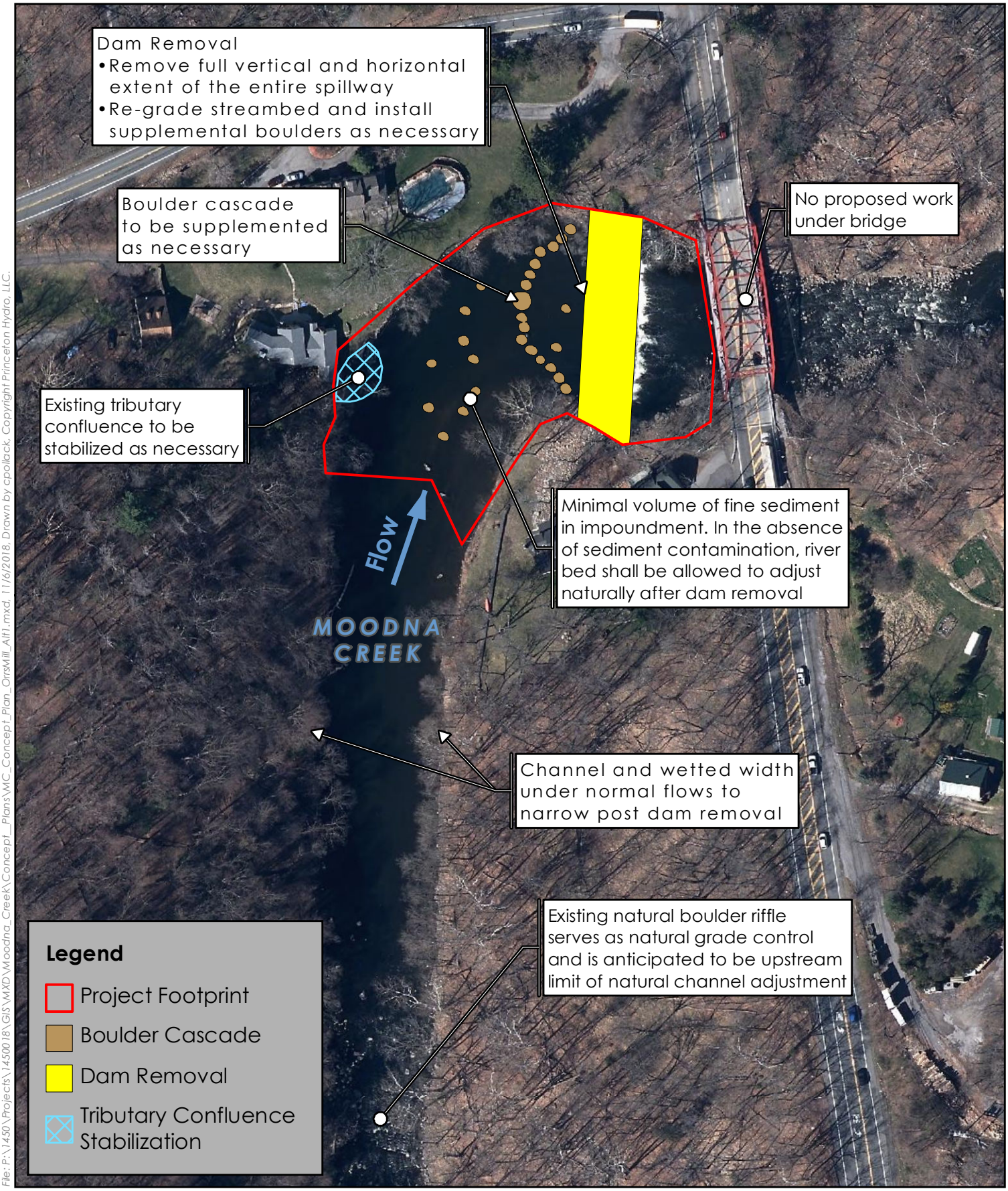
0 50 100 Feet

Map Projection: NAD 1983 StatePlane New York East FIPS 3101 Feet

CONCEPT PLAN
ALTERNATIVE 2

HUDSON RIVER HABITAT RESTORATION
MOODNA CREEK - AOP 2: FIRTH CLIFF DAM
TOWN OF CORNWALL
ORANGE COUNTY, NEW YORK

US Army Corps of Engineers®
New York District



File: P:\1450\Projects\1450018\GIS\MXD\Moodna_Creek\Concept_Plans\MC_Concept_Plan_OrrsMill_Alt1.mxd, 11/6/2018, Drawn by cpollack, Copyright Princeton Hydro, LLC.

NOTES:
1. 2016 orthoimagery obtained from the New York State GIS Clearinghouse: gis.ny.gov

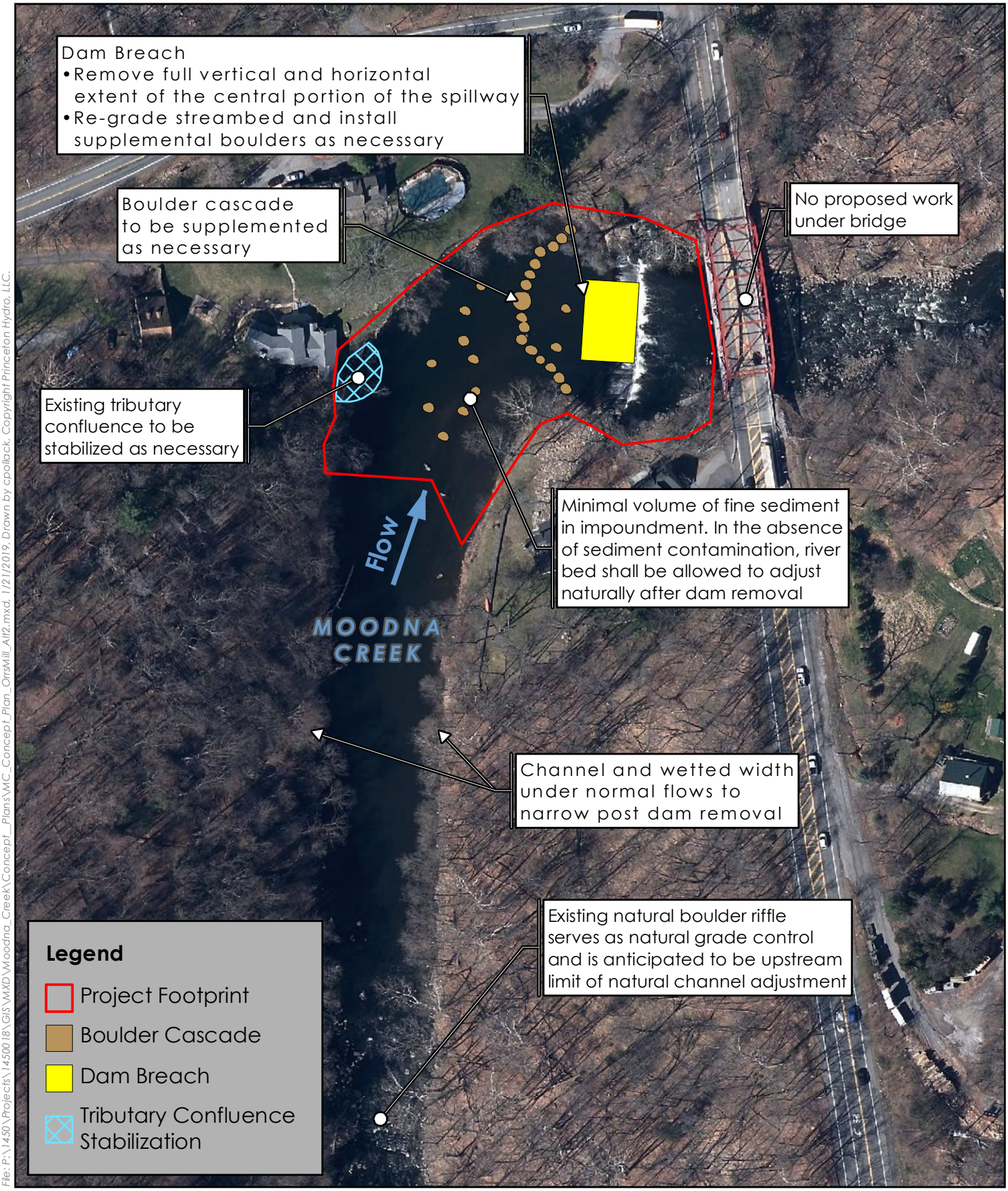
0 60 120 Feet

Map Projection: NAD 1983 StatePlane New York East FIPS 3101 Feet

CONCEPT PLAN
ALTERNATIVE 1

HUDSON RIVER HABITAT RESTORATION
MOODNA CREEK - AOP 3: ORR'S MILL DAM
TOWN OF CORNWALL
ORANGE COUNTY, NEW YORK

US Army Corps of Engineers®
New York District



File: P:\1450\Projects\1450018\GIS\MXD\Moodna_Creek\Concept_Plans\MC_Concept_Plan_OrrsMill_Alt2.mxd, 1/21/2019, Drawn by cpollack, Copyright Princeton Hydro, LLC.

NOTES:
1. 2016 orthoimagery obtained from the New York State GIS Clearinghouse: gis.ny.gov

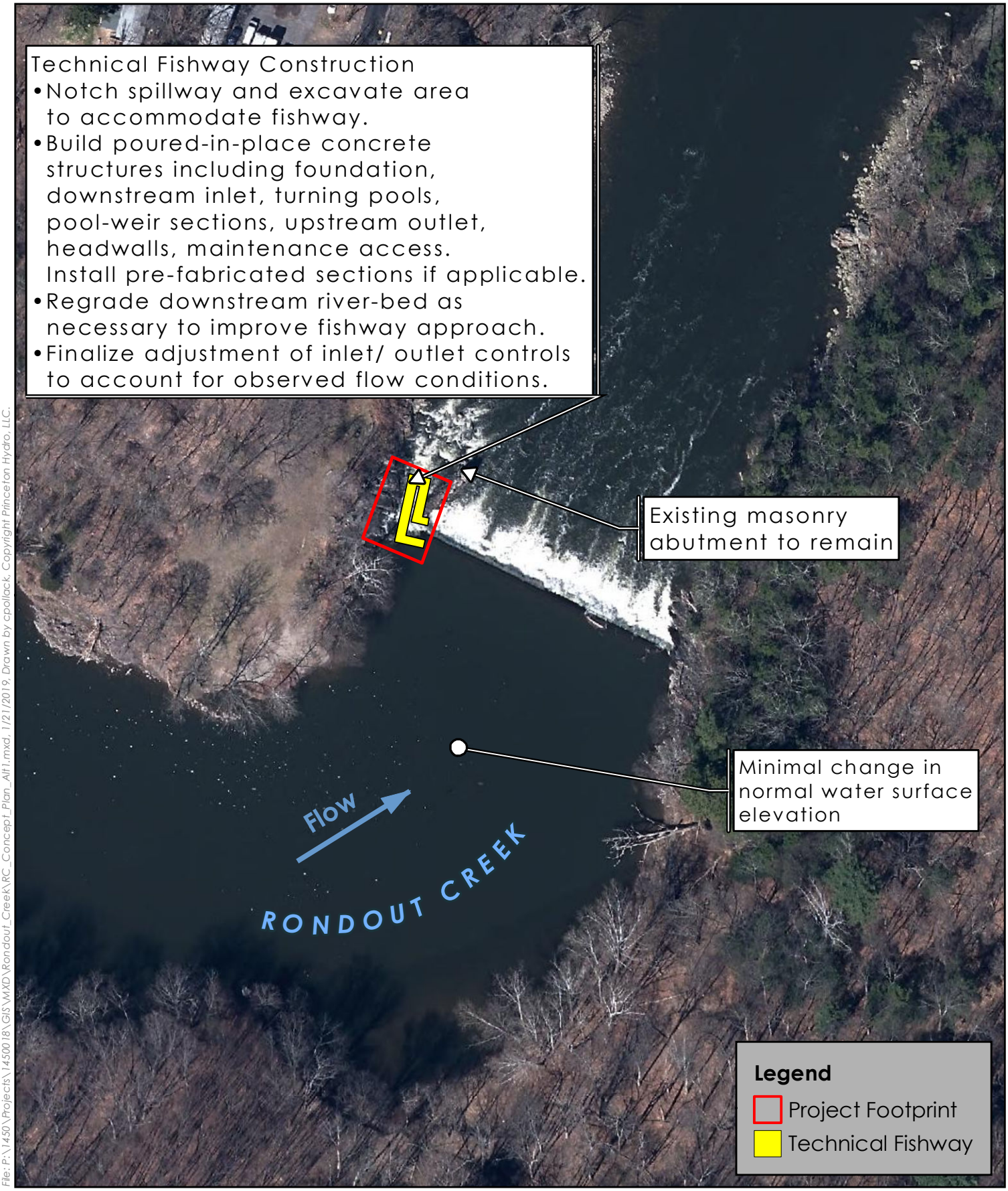
0 60 120 Feet

Map Projection: NAD 1983 StatePlane New York East FIPS 3101 Feet

CONCEPT PLAN
ALTERNATIVE 2

HUDSON RIVER HABITAT RESTORATION
MOODNA CREEK - AOP 3: ORR'S MILL DAM
TOWN OF CORNWALL
ORANGE COUNTY, NEW YORK

US Army Corps of Engineers®
New York District



File: P:\1450\Projects\1450018\GIS\MXD\Rondout_Creek\RC_Concept_Plan_Alt1.mxd, 1/21/2019, Drawn by cpollack, Copyright Princeton Hydro, LLC.

NOTES:
1. 2016 orthoimagery obtained from the New York State GIS Clearinghouse: gis.ny.gov

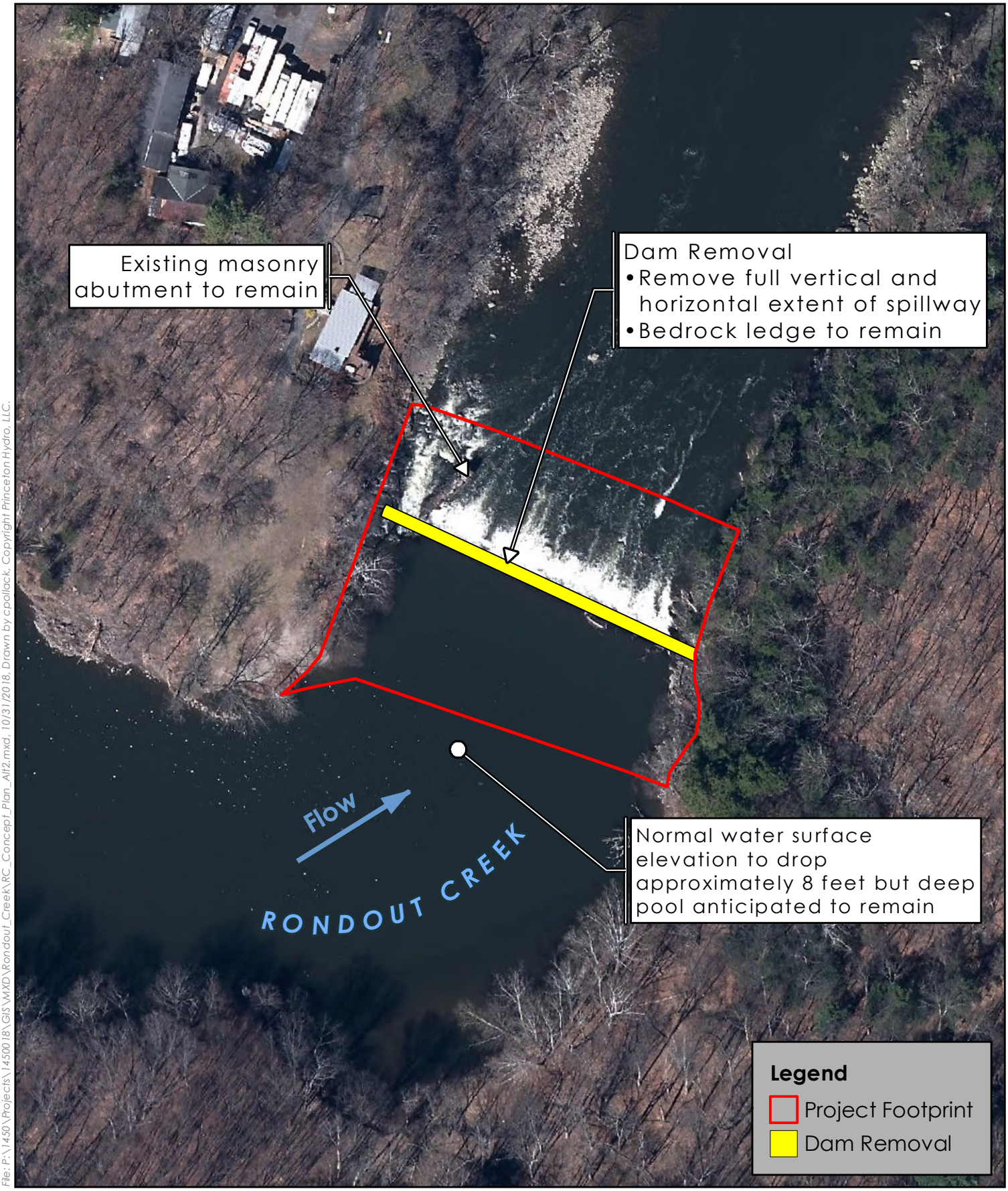
0 50 100 Feet

Map Projection: NAD 1983 StatePlane New York East FIPS 3101 Feet

CONCEPT PLAN
ALTERNATIVE 1

HUDSON RIVER HABITAT RESTORATION
RONDOUT CREEK
TOWNS OF ULSTER AND ESOPUS
ULSTER COUNTY, NEW YORK

US Army Corps of Engineers®
New York District



File: P:\1450\Projects\1450018\GIS\MXD\Rondout_Creek\RC_Concept_Plan_Alt2.mxd, 10/31/2018, Drawn by cpollack, Copyright Princeton Hydro, LLC.

NOTES:
1. 2016 orthoimagery obtained from the New York State GIS Clearinghouse: gis.ny.gov

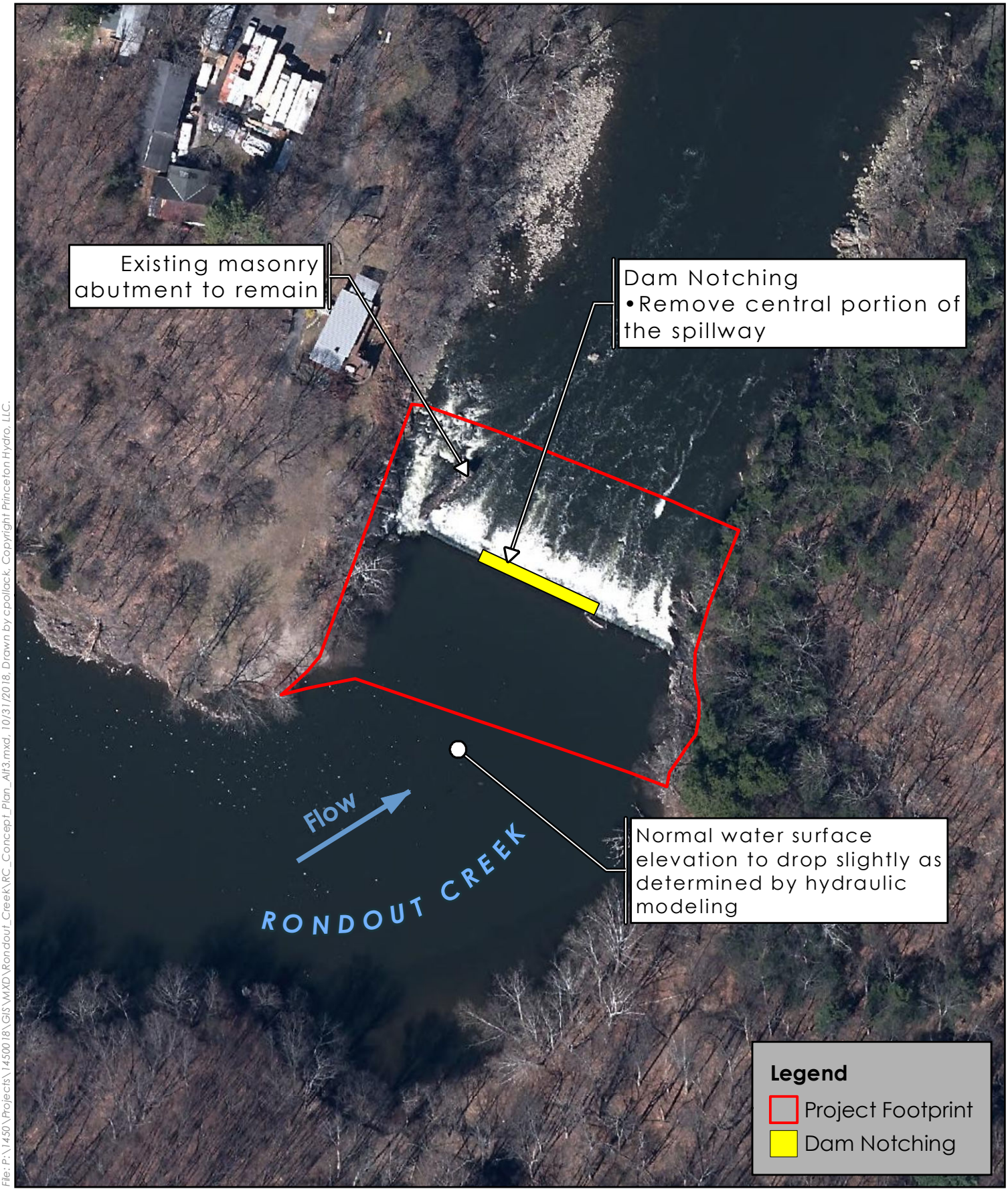
0 50 100 Feet

Map Projection: NAD 1983 StatePlane New York East FIPS 3101 Feet

CONCEPT PLAN
ALTERNATIVE 2

HUDSON RIVER HABITAT RESTORATION
RONDOUT CREEK
TOWNS OF ULSTER AND ESOPUS
ULSTER COUNTY, NEW YORK

US Army Corps of Engineers®
New York District



File: P:\1450\Projects\1450018\GIS\MXD\Rondout_Creek\RC_Concept_Plan_Alt3.mxd, 10/31/2018, Drawn by cpollack, Copyright Princeton Hydro, LLC.

NOTES:
1. 2016 orthoimagery obtained from the New York State GIS Clearinghouse: gis.ny.gov

0 50 100 Feet

Map Projection: NAD 1983 StatePlane New York East FIPS 3101 Feet

CONCEPT PLAN
ALTERNATIVE 3

HUDSON RIVER HABITAT RESTORATION
RONDOUT CREEK
TOWNS OF ULSTER AND ESOPUS
ULSTER COUNTY, NEW YORK

US Army Corps of Engineers®
New York District

Appendix B – New York State CRIS Data

BINNEN KILL

Table: Cultural Resource Surveys Conducted in the Vicinity of the Binnen Kill Study Area

OPRHP Survey #	Title	Authors
02SR52415	Phase IB Archaeological Field Reconnaissance, Bethlehem Water Supply Line, Town of Bethlehem, Albany County, NY	Hartgen Archaeological Associates, Inc.
03SR53196	Phase IA Archaeological Field Reconnaissance, Additional Test Wells, Bethlehem Water Supply, Town of Bethlehem, Albany County, New York	Hartgen Archaeological Associates, Inc
16SR00144	Selkirk Industrial Park, Phase I Archaeological Investigation	Hartgen Archaeological Associates, Inc.
13SR62644	Supplemental Trenching Protocol, Bethlehem Waste Water Treatment Plant Improvement, Dinmore Road, Town of Bethlehem, Albany County, New York	CITY/SCAPE Cultural Resources Consultants
13SR00295	Castleton-On-Hudson, A Historical Overview	Allen, Ellen S.
17SR00238	The Archaeology of Slavery in the Hudson River Valley - Nicoll-Sill House	Horsley, T.J.
97SR62148	Historical and Archaeological Resources of Castleton Island State Park, Town of Stuyvesant, Columbia County, New Baltimore, Greene County, and Schodack, Rennselaer County, New York: A Preliminary Phase I Cultural Resources Assessment	Paul R. Huey
98SR62150	Phase I Archaeological Field Investigation, Castleton Island State Park, Town of Schodack, Rensselaer County, New York	Hartgen Archaeological Associates, Inc.

Table: Archaeological Sites within 1 Mile of the Binnen Kill Study Area

OPRHP #	Site Name	Distance to APE	Period(s)	NR Status
00102.000043	Unocal Test Area 3/Locus 1	0.32	Prehistoric of unknown date	Not Eligible
00102.000198	Prehistoric	Within	Prehistoric of unknown date	Undetermined

00101.000551	Prehistoric Site 1	0.136	Prehistoric, Possible late woodland	Undetermined
00102.000552	Historic Site 1	0.175	Late 19th/Early 20th Century Domestic	Undetermined
00102.000555	Buckeye Site (NYSM 10914)	0.66	Prehistoric workshop of unknown date	Undetermined
00102.000556	Exit 22 Site (NYSM 10915)	0.568	Prehistoric workshop of unknown date	Undetermined
00102.000892	Bethlehem Ancestral Repatriation Site	0.113	Repatriation site	Undetermined
00102.000943	MDS 1 Shaver Site	0.357	Historic, unknown	Undetermined
00102.000944	MDS 2 foundation remains	0.357	Historic, unknown	Not Eligible
00102.000959	Gallup Precontact Site	0.132	Prehistoric	Undetermined
00102.000963	Nicoll-Sill House Grounds	0.151	Historic	Undetermined
00103.000315	Stylebarrack Road Prehistoric Site	0.765	Prehistoric	Undetermined
08313.000237	Ziegler's Ice House	8.22	Historic Ice House, ca. 1890-1920	Undetermined
08313.000238	Mahican Indian Village	0.646	Contact Period Village	Undetermined
08313.000249	Frank Bean's Ice House	0.236	Historic, ca. 1890-1920	Undetermined
08313.000250	Nine Mile Tree	0.294	Historic, ca. 1845	Undetermined
08313.000251	Unidentified Historic Site	0.317	Historic 19th-c., unknown	Undetermined
08313.000252	Montauk Ice House	0.280	Historic Ice House, ca. 1890	Undetermined
08313.000253	Dodd & Maloney Ice House	0.227	Historic Ice House, ca. 1890-1920	Undetermined
08313.000255	Ten Eyck House Site Vicinity	0.475	Historic House Site, ca. 1890-1920	Undetermined
08313.000256	Clifford's Ice House	0.413	Historic Calf Pasture, ca. 1663-1780	Undetermined
08313.000272	Brick Wall Feature	0.255	Historic, post-1900	Not Eligible

08313.000293	Barking Dogs Loci 1-2	0.850	Prehistoric, Middle to Late Woodland	Eligible
08313.000319	Schodack Landing Precontact Archaeological District	0.671	Prehistoric	Eligible
08313.0000320	Schodack Landing Historic Archaeological District	0.752	Historic	Eligible
08313.000321	Popanicuck Quarry	0.509	Prehistoric, Chert Quarry	Not Eligible
08343.000005	Castleton Screw Factory Site	0.584	Historic, ca. 1871 factory site	Undetermined
08343.000005	Foundation/ Brick Wall	0.295	Historic Site, unknown	Undetermined
08343.000058	Castleton Landings Historic Site/NYSM 11599	0.239	Historic Landing, ca. 1796-20th-c.	Eligible
08343.000059	Bridenbeck Briar Patch	0.876	Prehistoric Camp, Middle Woodland	Eligible

Table: National Register Listed or Eligible Sites within 1 Mile of the Binnen Kill Study Area

OPRHP #	Address	Name	Distance to APE	NR Status
---	---	Schodack Landing Historic District 90NR00967	0.86 Miles	Listed
00103.000304	65 Fox St	Mull House and Cemetery 90NR01476	0.11 Miles	Listed
00102.000725	85-89 Barent Winne Rd	George Best House	0.45 Miles	Eligible
08343.000029	42 North Main St	Hogeboom/Price Residence	0.47 Miles	Eligible
08343.000054	56 South Main St	Prins Insurance/old I.O.O.F.	0.26 Miles	Eligible
00102.000005	NY 144	Jacob Baker Homestead	0.2 Miles	Eligible

08343.000034	58 North Main St	Harder/Culver Residence	0.56 Miles	Eligible
00102.000685	1012 River Rd	Dr. MacDonald House	0.79 Miles	Eligible
08343.000002	99 South Main St	Hans Van Buren House	0.28 Miles	Eligible
08343.000056	35 Scott Ave	---	0.47 Miles	Eligible
00102.000047	163 Beaver Dam Rd	Baily House/Samaritan Shelters	0.95 Miles	Eligible
08343.000026	85 South Main St	Village Hall and Library	0.29 Miles	Eligible
08343.000028	40 North Main St.	Isaac V. Schermerhorn House (Cooper Residence)	0.31 Miles	Eligible
00102.000172	1370 NY 144	Building Y1; Queen Anne/Colonial Revival Frame Residence	0.3 Miles	Eligible
00102.000230	16 PAUSLEY CT	---	0.54 Miles	Eligible
08313.000338	---	Castleton-on-Hudson Bridge, ca. 1958	Within	Eligible
08343.000017	47 SOUTH MAIN ST	Marra Residence	0.25 Miles	Eligible
08343.000053	11 South Main St	A. Harder House/National Bank	0.23 Miles	Eligible
00102.000726	81 Barent Winne Rd	George Best House Carriage Barn	0.55 Miles	Eligible
08313.000358	---	Alfred H. Smith Memorial Bridge BIN 7006580	0.17 Miles	Eligible
08343.000055	134 South Main St	---	0.22 Miles	Eligible

08343.000057	47 Scott Ave	---	0.54 Miles	Eligible
08313.000126	914 River Rd	Potter House	0.27 Miles	Listed
00102.000001	1003 NY 144	Cedar Hill Schoolhouse (Bethlehem Academy)	0.82 Miles	Listed
00102.000004	NY 144	Nicoll-Sill or Bethlehem House 90NR01627	0.21 Miles	Listed

Schodack Island

Table: Cultural Surveys Conducted within the Vicinity of the Schodack Island Study Area

OPRHP Survey #	Title	Authors
00SR50710	Cultural Resources Investigation, Hudson River Habitat Restoration Study, Mill Creek Marsh, Town of Stuyvesant, Columbia County, New York; Schodack–Houghtaling Island, Town of New Baltimore, Greene County, New York	Harris and Pickman, USACE
00SR50896	Phase II Archeological Field Investigation, Access Road, Schodack Island State Park, Town of Schodack, Rensselaer County, New York	Hartgen Archaeological Associates, Inc.
01SR51979	Phase IB Monitoring, Wetland Mitigation Area and Boat Launch Installation, Schodack Island State Park, City of Castleton-on-Hudson, Rensselaer County, New York	Hartgen Archaeological Associates, Inc.
02SR52333	Cultural Resources Investigation and Remote Sensing Survey of the Hudson River at Athens Navigation Project, Athens, Greene County, New York	Panamerican Consultants, Inc.
02SR52481	ADDENDUM REPORT, ARCHEOLOGICAL MONITORING INVESTIGATION, SCHODACK ISLAND STATE PARK COMFORT STATION BUILDING, WATER TREATMENT BUILDING AND WATER LINE EXCAVATIONS, TOWN OF SCHODACK, RENSSELAER COUNTY, NEW YORK	Hartgen Archaeological Associates, Inc.
98SR62150	Phase I Archeological Field Investigation, Castleton Island State Park, Town of Schodack, Rensselaer County, New York	Hartgen Archaeological Associates, Inc.
99SR62149	Addendum Report, Phase I Archeological Field Investigation, Wetland Mitigation Areas 1 & 2, Schodack Island State Park, Town of Schodack, Rensselaer County, New York	Hartgen Archaeological Associates, Inc.

Table: Archaeological Sites within 1 Mile of the Schodack Island Study Area

OPRHP Site #	Site Name	Distance to APE	Period(s)	NR Status
00103.000027	Barren Island Cox-4	0.2 miles	Archaic to Woodland	Undetermined
00103.000303	Adam-Wolf Site NYSM 10507 Historic	0.43 miles	Historic, Late 19th Century	Undetermined

00103.000315	Stylebarrck Road Prehistoric Site	0.98 miles	Prehistoric	Undetermined
00103.000323	Coeymans House Site	0.32 miles	Historic	Undetermined
00103.000333	Crabapple Precontact Site	0.64 miles	Prehistoric	Eligible
00103.000334	The Coeymans-Bronck House Multicomponent Site	0.46 miles	Historic	Undetermined
00103.000407	VanDalfsen Cemetery & Niles Vault	0.47 miles	Historic	Undetermined
00103.000411	Coeymans Creek Mill Ruins Historic Site	0.34 miles	Historic	Undetermined
02117.000074	Brousseau Brickyard Site	0.37 miles	Historic	Undetermined
02117.000076	Vanderpoel Cemetery	0.9 miles	Historic	Undetermined
02117.000083	Shaw-Springsteen House Site	0.48 miles	Historic	Undetermined
02117.000084	William Van Ness House	0.59 miles	Historic	Undetermined
02117.000085	Conyn House Site	0.51 miles	Historic	Undetermined
02117.000086	Vanderpoel House and Farmstead	0.68 miles	Historic	Undetermined
02117.000087	Burns Dock and Dwellings and Stores	0.34 miles	Historic	Undetermined
02117.000088	J. Whannel House Site	0.37 miles	Historic	Undetermined
02117.000091	Blair Smith Site, NYSM 377	0.86 miles	Historic	Undetermined
02117.000092	Blair Smith Site (Monter Site), NYSM 377	0.41 miles	Prehistoric	Undetermined
02117.000101	Gardenier Ice House or National Ice Company Ice House	0.12 miles	Historic	Undetermined
02117.000101	Schermerhorn and Gardenier Ice House	0.05 miles	Historic	Undetermined
02117.000104	Hudson River Heights Prehistoric Site 1	0.5 miles	Prehistoric	Undetermined

02117.000105	Hudson River Heights Prehistoric Site 2	0.66 miles	Prehistoric, Late Archaic to Mid Woodland	Undetermined
03912.000003	Boat Slip	0.18 miles	Historic, 19th Cent.	Undetermined
03912.000004	Saw Mill	0.22 miles	Historic, 19th Cent.	Undetermined
03912.000005	Holding Tank	0.2 miles	Historic	Undetermined
03912.000006	Stone-Lined Boat Slip	0.25 Miles	Historic	Undetermined
03912.000007	Store House Complex	0.23 Miles	Historic	Undetermined
03912.000008	Store or Hotel Foundation	0.21 Miles	Historic	Undetermined
03912.000108	McCabe or Vanderpoel, Vanorden & Sherman Ice House	0.16 Miles	Historic	Undetermined
03912.000109	Horton & Company Ice House	Within	Historic	Undetermined
03912.000111	Scott brothers Ice House (Ice House A)	0.52 miles	Historic	Undetermined
03912.000112	P. McCabe & Co. Ice House (Ice House B)	0.36 miles	Historic	Undetermined
03912.000113	Vanderpoel, Van Orden & Sherman Ice House (Ice House C)	0.21 miles	Historic	Undetermined
08313.000209	Reyer Schermerhorn HSE Foundation	0.23 Miles	Historic	Undetermined
08313.00021	Farmers Turnpike and Bridge Remnant	0.21 Miles	Historic	Undetermined
08313.000211	Site of Reformed Church of Schodack	0.21 Miles	Historic	Undetermined
08313.000213	Yellow Store and Old Dock Area	0.41 Miles	Historic	Undetermined
08313.000234	Witbeck/Schermerhorn Farm Site (?)	0.08 Miles	Historic	Undetermined
08313.000235	Douw/Gardenier Farm Site (?)	0.05 Miles	Historic	Undetermined
08313.000236	Ice House Structure (1926)	0.26 Miles	Historic	Undetermined
08313.000237	Ziegler's Ice House	0.02 Miles	Historic	Undetermined

08313.000238	Mahican Indian Village	Within	Historic with Human Remains	Undetermined
08313.000242	Miller & Witbeck Ice House	Within	Historic	Undetermined
08313.000243	J.N. Briggs Ice House Site	0.04 Miles	Historic	Undetermined
08313.000245	Barge Wrecks	0.48 Miles	Historic	Undetermined
08313.000246	Van Buren Farm	0.53 Mile	Historic	Undetermined
08313.000247	Johnson House Site	0.51 Miles	Historic	Undetermined
08313.000248	Knickerbocker Ice House	0.54 Miles	Historic	Undetermined
08313.000249	Frank Bean's Ice House Site	0.18 miles	Historic	Undetermined
08313.00025	Nine Mile Tree	0.24 miles	Historic	Undetermined
08313.000251	Unidentified Site Historic	0.22 miles	Historic	Undetermined
08313.000252	Montauk Ice House Site	0.86 Miles	Historic	Undetermined
08313.000253	Dodd & Maloney Ice House Site	0.62 Miles	Historic	Undetermined
08313.000254	The Calverway	0.31 Miles	Historic	Undetermined
08313.000255	Ten Eyck House Site Vicinity	0.27 Miles	Historic	Undetermined
08313.000256	Clifford's Ice House	0.35 Miles	Historic	Undetermined
08313.000272	Brick Wall Feature	0.18 Miles	Historic	Not Eligible
08313.000287	A. A. Gardineer Historic and Precontact Site	0.61 Miles	Prehistoric and Historic	Eligible
08313.000288	Adams-A. Ten Eyck Historic and Precontact Site	0.28 Miles	Prehistoric	Eligible
08313.000289	County Line 1 Historic and Precontact Site	0.57 Miles	Prehistoric and Historic	Eligible
08313.00029	Dr. Peasley's Historic and Precontact Site	0.59 Miles	Prehistoric and Historic	Eligible
08313.000291	Hoffman Huyck Historic and Precontact Site	0.46 Miles	Prehistoric and Historic	Eligible

08313.000292	Jacob Schermerhorn Historic and Precontact Site	0.18 Miles	Prehistoric	Eligible
08313.000293	Barking Dogs Loci 1-2 Precontact Site	0.35 Miles	Prehistoric	Eligible
08313.000294	Lowland Precontact Site	0.26 Miles	Prehistoric	Eligible
08313.000295	Murphy Historic and Precontact Site	0.31 Miles	Prehistoric and Historic	Eligible
08313.000296	New Post Office Historic and Precontact Site	0.38 Miles	Prehistoric and Historic	Eligible
08313.000297	Schodack Landing Cemetery Historic and Precontact	0.27 Miles	Prehistoric	Eligible
08313.000298	Springstein-Dings Historic and Precontact Site	0.28 Miles	Prehistoric	Eligible
08313.000299	Van Dyke Historic Site	0.29 Miles	Historic	Eligible
08313.0003	Van Buren House Historic Site	0.63 Miles	Historic	Eligible
08313.000301	Tavern Stand Historic Site	0.36 Miles	Historic	Eligible
08313.000302	Squire/Barheyt Historic and Precontact Site	0.63 Miles	Prehistoric and Historic	Eligible
08313.000303	Miller's Hotel Historic Site	0.65 Miles	Historic	Eligible
08313.000304	Johnson Historic and Precontact Site	0.44 Miles	Prehistoric and Historic	Eligible
08313.000305	Herrick Residence Historic Site	0.49 Miles	Historic	Eligible
08313.000306	Herrick Post Office-Store Historic Site	0.63 Miles	Historic	Eligible
08313.000307	Depot Store Historic Site	0.69 Miles	Historic	Not Eligible
08313.000308	Buckley Historic and Precontact Site	0.50 Miles	Prehistoric and Historic	Eligible
08313.000309	A. Mull Historic and Precontact Site	0.25 Miles	Historic	Eligible
08313.000312	Firehouse Lane Historic and Precontact Site	0.35 Miles	Prehistoric and Historic	Eligible
08313.000313	Schodack Landing Road Historic and Precontact Site	0.46 Miles	Prehistoric and Historic	Eligible

08313.000314	L.P. Mattice Historic and Precontact Site	0.60 Miles	Prehistoric and Historic	Eligible
08313.000315	County Line 2 Precontact Site	0.43 Miles	Prehistoric	Eligible
08313.000316	Van Buren-Mattice Historic Site	0.57 Miles	Historic	Eligible
08313.000317	Herrick Historic Site	0.62 Miles	Historic	Eligible
08313.000319	Schodack Landing Precontact Archeological District	0.66 Miles	Prehistoric	Eligible
08313.000320	Schodack Landing Historic Archaeological District	0.44 Miles	Historic	Eligible
08313.000321	Popanicuck Quarry	0.47 Miles	Prehistoric	Not Eligible
08343.000005	Castleton Screw Factory Site	0.57 Miles	Historic	Undetermined
08343.000007	Foundation/Brick Wall	0.26 Miles	Historic	Undetermined
08343.000058	Castleton Landings Historic Site (NYSM 11599)	0.23 Miles	Historic	Eligible

Table: National Register Listed or Eligible Sites within 1 mile of the Schodack Island Study Area

OPRHP #	Address	Site Name	Distance to APE	NR Status
8313.000338	Castleton-on-Hudson Bridge, ca. 1958	---	0.69 Miles	Eligible
8313.000358	---	Alfred H. Smith Memorial Bridge BIN 7006580	0.61 Miles	Eligible
103.000043	32 Church Street 12045	---	0.55 Miles	Listed
103.000054	35 Church Street - 35 Church Street 12045	Former Reformed Protestant Church of Coeymans Parsonage	0.56 Miles	Listed
103.000061	6 Fourth St	---	0.38 Miles	Listed

103.000068	14 Dock Street	Noble H. Johnson/Newton J. Briggs House	0.32 Miles	Listed
103.000079	23 Second Street	---	0.38 Miles	Listed
103.000086	3 Westerlo St	Natle House/J. Cronk House	0.35 Miles	Listed
103.000093	82 Main Street	Wolf Building/Bruno Store -	0.39 Miles	Listed
103.000104	95 Main St	---	0.42 Miles	Listed
103.000111	28 Westerlo Street	Gladney Hosue	0.46 Miles	Listed
103.000118	4 Fifth St	---	0.48 Miles	Listed
103.000129	54 Westerlo Street	---	0.57 Miles	Listed
103.000136	Westerlo St	---	0.68 Miles	Listed
103.000144	67 Westerlo Street	---	0.63 Miles	Listed
103.000155	43 Westerlo St	---	0.54 Miles	Listed
103.000162	5 Colvin Ave	---	0.48 Miles	Listed
103.000311	29 Second Street 12045	Brigadier General David McCarty Stone Cottage	0.38 Miles	Listed
2117.000048	Ridge Rd.	Requa House	0.49 Miles	Listed
8313.000012	878 River Rd.	Jacob Schermerhorn House	0.32 Miles	Listed
103.000345	36 Westerlo Street	---	0.49 Miles	Listed
103.000353	Uthe Blvd	Parish Family Cemtery	0.52 Miles	Listed
103.000359	6 Uthe Blvd.	---	0.49 Miles	Listed
103.000369	59 Main St	59 Main St, Coeymans	0.43 Miles	Listed
103.000376	64 Main Street	Lillian Margaria/Pasquale and Jane Pagano House	0.39 Miles	Listed

103.000387	Main Street	VanDalfsen Burial Ground	0.51 Miles	Listed
103.000393	11 Einie Drive	---	0.59 Miles	Listed
103.000402	17 Frangella Drive	---	0.64 Miles	Listed
103.000405	18 Frangella Drive	---	0.64 Miles	Listed
103.000045	36 Church Street	Former Methodist-Episcopal Church	0.56 Miles	Listed
103.000052	23 Church Street	Nathanial Niles House	0.51 Miles	Listed
103.000059	104 Main St.	Map Code 2	0.41 Miles	Listed
103.00007	7 First Street	W.B. Holmes House	0.34 Miles	Listed
103.000077	24 Second Street	---	0.37 Miles	Listed
103.000084	12 Westerlo St.	Frangella House	0.37 Miles	Listed
103.000095	88 Main Street	Jonathan McElroy House	0.40 Miles	Listed
103.000102	98 Main Street 12045	98 Main Street	0.40 Miles	Listed
103.000109	26 Westerlo Street	---	0.45 Miles	Listed
103.00012	13 Church Street	Acton Civill Home/Mount Pleasant	0.46 Miles	Listed
103.000127	42 Westerlo St	---	0.54 Miles	Listed
103.000134	Westerlo St	---	0.65 Miles	Listed
103.000146	61 Westerlo St	---	0.60 Miles	Listed
103.000153	49 Westerlo Street	Abraham Teal House	0.55 Miles	Listed
103.00016	6 Colvin Ave	---	0.49 Miles	Listed
147.000036	110 Main St	---	0.42 Miles	Listed
8313.000126	914 River Rd	Potter House	0.32 Miles	Listed

8313.000133	846 River Rd	Rowe Huestis	0.30 Miles	Listed
8313.000158	780 River Rd	Matson-Miller House	0.21 Miles	Listed
8313.000194	494 River Rd	Stanley Todd House	0.69 Miles	Listed
103.000344	27 Westerlo Street	---	0.42 Miles	Listed
103.000352	131 Main Street	---	0.49 Miles	Listed
103.000357	126 Main Street	---	0.46 Miles	Listed
103.000362	79 Main Street	---	0.40 Miles	Listed
103.000371	55 Main Street	Boyd House/M. K. Pape House	0.44 Miles	Listed
103.000381	52 Main Street	---	0.42 Miles	Listed
103.000396	- 5 Blaisdell Avenue	---	0.55 Miles	Listed
103.000401	11 Frangella Drive	---	0.62 Miles	Listed
103.000007	28-31 Stone House Hill Road	Ariaantje Coeymans Verplanck and Samuel Coeymans Stone House	0.38 Miles	Listed
103.000042	30 Church Street	Pape/Travis Hosue	0.53 Miles	Listed
103.000044	34 Church Street	Modern Apartment House (R. Rennie House demolished)	0.55 Miles	Listed
103.000046	38 Church St 12045	38 Church St, Coeymans	0.58 Miles	Listed
103.000067	10 Dock Street	Dory Shop/Dolan House	0.3 Miles	Listed
103.000069	8 Dock St	Winnie House	0.29 Miles	Listed
103.000071	9 First Street	Henry Slingerland House/Almindo Hosue	0.35 Miles	Listed
103.000076	30 Second Street	L. Zeigler House	0.37 Miles	Listed

103.000078	8 Fourth Street	McNaughton House/McCarty Storehouse	0.39 Miles	Listed
103.000101	86 Main Street	Miss Cronk's House	0.39 Miles	Listed
103.000103	100 Main Street	Wiltsey Building	0.40 Miles	Listed
103.000112	53 Church Street	---	0.66 Miles	Listed
103.000135	Westerlo ST	---	0.67 Miles	Listed
103.000138	22 Civill Avenue	Former Academy Dormitory	0.68 Miles	Listed
103.000145	63 Westerlo St	Peter Seabridge House	0.61 Miles	Listed
103.000147	55 Westerlo Street	Theodore Slingerland House/Orlando Ferraro House	0.58 Miles	Listed
8313.000127	804 River Rd	Van Dyke House	0.24 Miles	Listed
8313.000136	818 River Rd	Spaulding Tenant HSE	0.26 Miles	Listed
8313.000159	711 River Rd	Schermerhonr Matson	0.19 Miles	Listed
8313.000195	496 River Rd	Andrew Van Buren HSE	0.70 Miles	Listed
103.000347	2185 River Road (NYS 144)	Annunziato Adamo Building	0.47 Miles	Listed
103.000351	135 Main Street	---	0.5 Miles	Listed
103.000363	71 Main Street	---	0.4 Miles	Listed
103.000365	67 Main Street	Persico House	0.42 Miles	Listed
103.00037	57 Main Street	Keppler House	0.43 Miles	Listed
103.000372	74 Main Street	---	0.37 Miles	Listed
103.000375	66 Main Street	Connors House	0.41 Miles	Listed
103.000394	13 Einie Drive	Clouse House	0.59 Miles	Listed
103.000395	4 Einie Drive	---	0.59 Miles	Listed

103.000404	10 Frangella Drive	---	0.60 Miles	Listed
103.000406	30 Frangella Drive	---	0.70 Miles	Listed
103.000051	21 Church Street	William Hull/Zelda Uthe House	0.50 Miles	Listed
103.000053	31 Church Street	Theophilus Civill House	0.54 Miles	Listed
103.00006	8 Fourth Street	Ziegler Broom Factory/Edwin Ziegler Duplex	0.39 Miles	Listed
103.000062	24 First St	H. Smith House/Motley Home	0.34 Miles	Listed
103.000085	First St	Tobin House	0.33 Miles	Listed
103.000087	5 Westerlo St	---	0.35 Miles	Listed
103.000092	80 Main St	---	0.38 Miles	Listed
103.000094	84 Main Street	Schafer House and Store	0.39 Miles	Listed
103.000096	90 Main Street	Wm. Hull House/Store/Post Office Palmer Barber Shop	0.40 Miles	Listed
103.000119	6 Fifth St	---	0.48 Miles	Listed
103.000121	2 Uthe Blvd	---	0.48 Miles	Listed
103.000126	42 Westerlo Street	---	0.52 Miles	Listed
103.000128	50 Westerlo St	---	0.56 Miles	Listed
103.000152	13 Blaisdell Avenue	---	0.53 Miles	Listed
103.000154	47 Westerlo Street	M.L. Cloonley/Charlotte Houghtaling House	0.55 Miles	Listed
103.000161	10 Colvin Ave	---	0.49 Miles	Listed
103.000163	19 Westerlo St	---	0.47 Miles	Listed
103.00032	9 Stonehouse Hill Rd	---	0.45 Miles	Listed

103.000338	59 Church	Rienti House	0.69 Miles	Listed
103.000343	25 Westerlo Street	Irving Lodge 254/Knights of Pythias Hall	0.46 Miles	Listed
103.000358	134 Main Street	Sorell's Garage	0.45 Miles	Listed
103.00036	10 Uthe Blvd.	---	0.49 Miles	Listed
103.000388	Main Street	Niles Burial Vault	0.50 Miles	Listed
103.000389	4 Frangella Drive	---	0.59 Miles	Listed
103.0004	7 Frangella Drive	---	0.59 Miles	Listed
103.000041	24 Church Street	Former Dutch Reformed Church	0.51 Miles	Listed
103.000055	39 Church Street	J. Hazelton House	0.58 Miles	Listed
103.000056	109 Westerlo St	Blaisdell Farm	0.77 Miles	Listed
103.000073	17 First Street	Colvin House	0.35 Miles	Listed
103.000088	7 Westerlo St	Pape's Store (Brick Row)	0.37 Miles	Listed
103.000091	78 Main Street	Coeymans Herald Building/Former Fire House	0.38 Miles	Listed
103.000105	93 Main Street	---	0.42 Miles	Listed
103.000106	91 Main Street	---	0.42 Miles	Listed
103.000123	38 Westerlo Street	---	0.50 Miles	Listed
103.000139	7 Civill Ave	---	0.66 Miles	Listed
103.000142	71 Westerlo St	Irwin House	0.65 Miles	Listed
103.000143	69 Westerlo Street	---	0.64 Miles	Listed
103.000156	37 Westerlo Street	Lewis Clark House	0.52 Miles	Listed

103.000157	37 Westerlo Street	C.F. Suderly-Henry Slingerland-Louis Frangella Home	0.50 Miles	Listed
103.000295	11 River View Dr	Church	0.52 Miles	Listed
8313.000129	Haberltern – 874 River Rd	Isaac Moll	0.29 Miles	Listed
8313.00013	864 River Road	A Mull Reed	0.28 Miles	Listed
8313.000197	424 River Rd	Don Van Buren House Williams	0.64 Miles	Listed
103.000337	102 Main Street	---	0.40 Miles	Listed
103.000342	45 Westerlo Street	Former Carriage House	0.54 Miles	Listed
103.000349	5 Riverview Drive	---	0.51 Miles	Listed
103.00035	137 Main Street	---	0.50 Miles	Listed
103.000361	12 Uthe Blvd.	---	0.49 Miles	Listed
103.000368	61 Main Street	Louis and Jannie Bohem House/Edward and Mildred Geddings House	0.44 Miles	Listed
103.000373	72 Main Street	Peter Ryan/ Thomas Pagano House	0.39 Miles	Listed
103.000374	70 Main Street	Former Coeymans Firehouse	0.39 Miles	Listed
103.000382	Blaisdell Avenue	St. Patrick's Church Site (1850-1917)	0.55 Miles	Listed
103.000383	47 Blaisdell Avenue	---	0.56 Miles	Listed
103.000391	16 Blaisdell Avenue	Boehkle Home	0.56 Miles	Listed
103.000392	14 Blaisdell Avenue	---	0.56 Miles	Listed
103.000399	1 Frangella Drive	---	0.56 Miles	Listed

103.000008	8 Civill Ave. 12045	Action Civill Polytechnic Institute (Coeymans School)	0.70 Miles	Listed
103.00001	109 Westerlo Street	Levi Blaisdell House	0.77 Miles	Listed
103.000047	40 Church Street	Alexander Willis House	0.59 Miles	Listed
103.000049	46 Church Street	Second Empire Hosue	0.62 Miles	Listed
103.000064	First St	Briggs Barn	0.33 Miles	Listed
103.000066	1518 First St	---	0.33 Miles	Listed
103.000081	13 Second St	---	0.37 Miles	Listed
103.000083	10 Westerlo Street	---	0.37 Miles	Listed
103.000098	94 Main Street	---	0.40 Miles	Listed
103.0001	96 Main Street	J.D. Bailey House/Coeymans Landing Post Office	0.40 Miles	Listed
103.000113	Church St	---	0.65 Miles	Listed
103.000115	47 Church Street	Former M.E. Church Parsonage	0.44 Miles	Listed
103.000117	2 Fifth St	---	0.48 Miles	Listed
103.00013	2 New Street	Minnock House	0.60 Miles	Listed
103.000132	64 Westerlo Street	---	0.63 Miles	Listed
103.000148	53 Westerlo Street	S. King House	0.57 Miles	Listed
103.00015	17 Blaisdell Avenue	---	0.53 Miles	Listed
103.000302	Main St	BIN 1-03808-0	0.48 Miles	Listed
8313.000137	814 River Rd	Spalding Tenant HSE	0.25 Miles	Listed
103.00034	17 Civill Avenue	Persico Home	0.65 Miles	Listed

103.000346	2181 River Road (NYS 144)	Adamo's Tavern/Vincenzo Adamo Building	0.47 Miles	Listed
103.000354	11 Stonehouse Hill Road	---	0.44 Miles	Listed
103.000356	132 Main Street	---	0.47 Miles	Listed
103.000377	62 Main Street	---	0.40 Miles	Listed
103.000379	60 Main Street	---	0.41 Miles	Listed
103.000385	Blaisdell Avenue	Grove Cemtery	0.62 Miles	Listed
103.000386	Blaisdell Avenue	St. Patrick's Cemtery	0.55 Miles	Listed
103.000057	Main St (NY 144)	Dr. Wesley Blaisdell House 'Maplehurst	0.41 Miles	Listed
103.000058	108 Main St	Map Code 1; Van Der Zee Residence	0.42 Miles	Listed
103.000072	13 First Street	Albert Briggs/Fori House	0.35 Miles	Listed
103.000075	23 First Street	Baptist Parsonage/Mrs. Ten Eyck House	0.36 Miles	Listed
103.000089	9 Westerlo St	---	0.37 Miles	Listed
103.00009	76 Main Street	Peter Seabridge House	0.38 Miles	Listed
103.000107	83 Main St.	Levi Blaisdell House	0.41 Miles	Listed
103.000108	81 Main Street	Aaron Hotaling Hotel/Dan O'Connell (O'Connell Brothers) Bar	0.40 Miles	Listed
103.000122	22 Church Street	---	0.51 Miles	Listed
103.000125	40 Westerlo Street	---	0.51 Miles	Listed
103.00014	9 Civill Ave	---	0.65 Miles	Listed

103.000141	75 Westerlo Street	McHugh House	0.67 Miles	Listed
103.000158	11 Blaisdell Ave	Justin Bishop House	0.54 Miles	Listed
103.000159	4 Colvin Ave	---		Listed
8313.000131	860 RIVER RD	Huyck House	0.28 Miles	Listed
8313.000196	492 RIVER RD	E J Smith House	0.71 Miles	Listed
103.000329	50 Main Street 12045	Col. Sanford Hathaway House -	0.42 Miles	Listed
103.000339	55 Church Street	Furstin Home	0.67 Miles	Listed
103.000348	7 Riverview Drive	---	0.51 Miles	Listed
103.000366	65 Main Street	---	0.43 Miles	Listed
103.000367	63 Main Street	---	0.43 Miles	Listed
103.000384	63 Blaisdell Avenue	Dr. Ira and Helen LeFever House	0.55 Miles	Listed
103.00039	12 Blaisdell Avenue	Modern Apartment Building	0.56 Miles	Listed
103.000397	7 Blaisdell Avenue	---	0.55 Miles	Listed
103.000398	26 Blaisdell Avenue	Samuel and Nancy Frangella House	0.57 Miles	Listed
103.000009	NY 144	Coeymans-Bronck House	0.46 Miles	Listed
103.000048	44 Church Street	Mrs. Pequa House	0.61 Miles	Listed
103.00005	54 Church Street	Abraham Houghtaling House Windy Hill	0.67 Miles	Listed
103.000063	22 First St	G. Clow House	0.33 Miles	Listed
103.000065	12 First Street	Randio/Alberts Home	0.33 Miles	Listed
103.00008	25 Second St	Map Code 23	0.38 Miles	Listed
103.000082	11 Second St	---	0.37 Miles	Listed

103.000097	92 Main St	---	0.40 Miles	Listed
103.000114	49 Church St	---	0.64 Miles	Listed
103.000116	47 Church Street	Former M.E. Parsonage	0.63 Miles	Listed
103.000133	66 Westerlo Street	---	0.66 Miles	Listed
103.000149	51 Westerlo Street	Coeymans Academy	0.57 Miles	Listed
103.000151	15 Blaisdell Ave	---	0.53 Miles	Listed
103.000231	PAPE ST	Frame Dwelling, Late 19th Century	0.39 Miles	Listed
103.000304	65 FOX ST	Mull House and Cemetery	0.49 Miles	Listed
103.000309	62 Westerlo St		0.63 Miles	Listed
103.000324	22 Westerlo St	William and Bea Burton House	0.43 Miles	Listed
8313.000138	810 River Rd	Hoes Jones	0.21 Miles	Listed
103.000335	14 Einie Drive 12045	Peter & Maragret Mayone House	0.61 Miles	Listed
103.000341	2 John Street	Blaisdell Tenant Farmhouse	0.74 Miles	Listed
103.000355	3 Stonehouse Hill Road	Peter Whitbeck House/Brewer Home	0.46 Miles	Listed
103.000378	58 Main Street	---	0.41 Miles	Listed
103.00038	56 Main Street	---	0.42 Miles	Listed
103.000403	27 Frangella Drive	---	0.69 Miles	Listed

Henry Hudson Park

Table: Cultural Resources Surveys Conducted in the Vicinity of the Henry Hudson Park Study Area

OPRHP Survey #	Title	Authors
99SR61485	Phase I Archaeological Survey of the Proposed Fiber Optic Cable, Berkshire Connector, Albany and Rensselaer Counties, New York	TRC
02SR52415	Phase IB Archaeological Field Reconnaissance, Bethlehem Water Supply Line, Town of Bethlehem, Albany County, New York	Hartgen Archaeological Associates, Inc.
02SR52647	A Cultural Resources Survey report for an Archaeological Reconnaissance Survey/Architectural Survey of PIN 1097.04.101, NY 9J and NY 150, Village of Castleton, Rensselaer County, New York	New York State Museum
03SR53196	Phase 1B Archaeological Field Reconnaissance, Additional Test Wells, Bethlehem Water Supply, Town of Bethlehem, Albany County, New York	Hartgen Archaeological Associates, Inc.
13SR62644	Supplemental Trenching Protocol, Bethlehem Waste Water Treatment Plant Improvement, Dinmore Road, Town of Bethlehem, Albany County, New York	CITY/SCAPE Cultural Resources Consultants 2013
13SR00295	Castleton-On-Hudson, A Historical Overview	Allen, Ellen S.
17SR00238	The Archaeology of Slavery in the Hudson River Valley - Nicoll-Sill House	Horsley, T.J. 2015

Table: Archaeological Sites within 1 mile of the Henry Hudson Park Study Area

OPRHP Site #	Site Name	Distance to APE	Period(s)	NR Status
0102.000198	Prehistoric	0.28	Prehistoric	Undetermined
0102.000551	Prehistoric Site 1	0.85	Prehistoric	Undetermined
0102.000552	Historic Site 1	0.85	Historic	Undetermined

0102.000892	Bethlehem Ancestral Repatriation Site	0.17	Prehistoric/Historic	Undetermined
8343.000005	Castleton Screw Factory Site	0.98 miles	Historic	Undetermined
8343.000058	Castleton Landing Historic Site (NYSM 11599)	0.71 miles	Historic	Eligible
NYSM Site 470	Cedar Hill	0.49	Unknown	Unknown
NYSM Site 6013	Cedar Hill	Within APE	Unknown	Unknown
NYSM Site 372	No Info	0.5	Unknown	Unknown
NYSM Site 5781	Nicoll-Sill House	0.32 miles	Unknown	Unknown
NYSM Site 471	No Info	0.04 miles	Unknown	Unknown

Table: National Register Listed or Eligible Sites within 1 mile of the Henry Hudson Park Study Area

OPRHP #	Address	Site Name	Distance to APE	Status
00102.000724	144 Barent Winne Rd	Winne-Putney House	0.36	Eligible
8343.000017	47 SOUTH MAIN ST	Marra Res	0.88	Eligible
8343.000053	11 South Main St	A. Harder House/National Bank	0.80	Eligible
8343.000034	8 North Main St	Harder/(Culver Res	0.54	Eligible
00102.000726	81 Barent Winne Rd	George Best House Carriage Barn	0.20	Eligible
102.000685	Dr. MacDonald House - 1012 River Rd	---	0.38	Eligible
8343.000056	35 Scott Ave	---	0.79	Eligible
102.000725	85-89 Barent Winne Rd	George Best House	0.08	Eligible
8343.000029	42 North Main St	Hogeboom/Price Residence	0.59	Eligible

8343.000054	56 South Main St	Prins Insurance/old I.O.O.F.	0.85	Eligible
8343.000028	40 North Main St	Isaac V Schermerhorn House (Cooper Residence)	0.60	Eligible
8343.000057	47 Scott Ave	---	0.84	Eligible
102.000001	1003 NY 144	Cedar Hill Schoolhouse (Bethlehem Academy)	0.47	Listed
102.000004	NY 144	Nicoll-Sill or Bethlehem House	0.17	Listed

Charles Rider Park

Table: Cultural Resources Surveys Conducted in the Vicinity of the Charles Rider Park Study Area

OPRHP Survey #	Title	Authors
03SR53792	Phase IA/IB Cultural Resources Survey, Kingston–Rhinecliff Bridge Bulkhead, Ramp & Access Road Project, Town of Kingston, Ulster County, New YorK	Birchwood Archaeological Services

Table: Archaeological Sites within 1 mile of the Charles Rider Park Study Area

OPRHP Site #	Site Name	Distance to the APE	Period(s)	NR Status
11106.000018	Rose Brothers Brickworks Site	0.43	@1900-1920	Undetermined
11118.000066	Historic Limestone Quarry Tramway	0.96	Late 19th to mid-20th Century	Undetermined
11118.000067	Historic Limestone Quarry Foundation	0.96	Historic	Undetermined
11118.000068	Kalkberg Chert quarry	1.00	Unknown prehistoric	Undetermined
11118.000070	Miron Prehistoric Site 1	0.53	Prehistoric	Undetermined
11118.000071	Miron Prehistoric Site 2	0.41	Prehistoric	Undetermined
11118.000072	Millens PreContact Quarry/Workshop Locus 1	0.66	Prehistoric	Eligible
11118.000073	Millens PreContact Quarry/Workshop Locus 2	0.68	Prehistoric	Not Eligible
11118.000074	Millens PreContact Quarry/Workshop Locus 3	0.68	Prehistoric	Not Eligible
11118.000075	Millens PreContact Quarry/Workshop Locus 4	0.72	Prehistoric	Not Eligible

Table: National Register Listed or Eligible Sites within 1 mile of the Charles Rider Park Study Area

OPRHP #	Address	Site Name	Distance to APE	Status
2106.000269	---	Hudson River Historic District; 92NR00302	0.39	Listed
2715.000665	Route 199	Kingston-Rhinecliff Bridge	0.41	Listed
11118.000054	1019 Flatbush Road	Ten Broeck, Benjamin, House; 05NR05471	0.79	Listed
---	---	Sixteen Mile District; 90NR00219	0.39	Listed

MOODNA Creek

AOP 1

Table: Cultural Resources Surveys Conducted within 1 mile of the Moodna AOP 1 Study Area

OPRHP Survey #	Title	Authors
03SR54150	Stage IA Archaeological Assessment, Proposed Catskill Aqueduct Connection, Village of Kiryas Joel, Orange County, New York	Historical Perspectives, Inc. 2003
04SR55580	Phase IA Literature Review and Sensitivity Analysis and Phase 1B Archaeological Field Reconnaissance Survey, Willow Woods Subdivision, Willow Ave & route 9W, Town of Cornwall, Orange County, New York	CITY/SCAPE Cultural Resources Consultants; 2004
06SR56414	Phase I Archaeological Investigation of the Nextel Wireless New Windsor Est Site Communication Facility Project Area	Eugene Boesch; 2006
06SR56751	Phase I Cultural Resources Survey, Site Assessment and Site Identification Phases, Proposed Cornwall Commons Development, Town of Cornwall, Orange County, New York	Oberon, Stephen J. 2006
08SR57981	Phase IA Literature Review and Sensitivity Analysis and Phase IB Archaeological Field Reconnaissance Survey, New Windsor Seniors, Windsor Highway, Town of New Windsor, Orange County, New York	CITY/SCAPE Cultural Resources Consultants; 2010
08SR58298	Phase I Archaeological Investigation for the Proposed Knox Village Senior Housing, Vails Gate, Town of New Windsor, Orange County, New York	Tracker Archaeology Services, Inc. 2008
08SR58380	Archaeological Refinement Study, Proposed Catskill Aqueduct Connection, Village of Kiryas Joel, Orange County, New York	Historical Perspectives Inc. 2008
08SR58461	Phase I Cultural Resources Survey Site Assessment and Site Identification Phases, Proposed Rizzi Development Parcel, Town of New Windsor, Orange County, New York	Oberon, Stephen J. 2008
10SR59902	Amber Grove Site, Phase 1A Literature Review and Sensitivity Analysis & Phase 1B Archaeological Field Reconnaissance Survey, Blooming Grove Turnpike and Forge Hill Road, Town of New Windsor, Orange County, New York	CITY/SCAPE Cultural Resources Consultants,; 2010

15SR00596	Phase IA Literature Review and Sensitivity Assessment ad Phase IB Archaeological Fieldwork, Butterhill Well Alternative Water Supply, Town of New Windsor, Orange County, New York	STRATA Cultural Resource Management, LLC 2015
16SR00428	Phase IA Literature Review and Sensitivity Assessment ad Phase IB Archaeological Fieldwork, Butterhill Well Alternative Water Supply, Town of New Windsor, Orange County, New York	STRATA Cultural Resource Management, LLC 2016
17SR00661	Addendum to Stage 1A Archaeological Assessment Proposed Catskill Aqueduct Connection Village of Kiryas Joel, Orange County, New York	Historical Perspectives, Inc. 2004
17SR00664	Phase IB Archaeological Investigation, Catskill Aqueduct Connection, Phase II Transmission Line, Towns of Cornwall and New Windsor, Orange County, New York	Historical Perspectives, Inc. 2017
99SR50360	Historical Archaeology of the Ellison's Flour Mill at Knox's Headquarters State Historic Site, Orange County, NY	Fisher, Charles L. 1999

Table: Archaeological Sites within 1 mile of the Moodna AOP 1 Study Area

OPRHP Site #	Site Name	Distance to APE	Period(s)	NR Status
07103.000253	Woodward Historic site	0.63 miles	Historic, 19th Cent.	Not Eligible
07115.000018	The Nicoll Farm Site	0.95 miles	Prehistoric	Undetermined
07115.000019	The O'Rourke Burial Site; NYSM Site # 562	0.93 miles	Historic	Undetermined
07115.000024	Canterbury Lane West Site	0.78 miles	Unknown	Undetermined
07115.000025	Canterbury Lane East and Forge Hill Road Site	0.8 miles	Historic	Undetermined
07115.000026	Hazard's Mill Lott – Industrial Complex	0.61 miles	Historic, 18th Cent.	Undetermined
07115.000027	Old Ice House Remains	0.64 miles	Historic	Undetermined
07115.000028	Prehistoric Site	0.69 miles	Prehistoric	Undetermined
07115.000704	Cornwall Commons Stray #1	0.08 miles	Prehistoric	Not Eligible
07115.000705	Cornwall Commons Stray #2	0.08 miles	Prehistoric	Not Eligible

07115.000731	Ridge Rise Precontact Site # 2	1 mile	Prehistoric	Not Eligible
07115.000750	Elfwood Foundations Historic Site	0.37 miles	Historic 19th Cent.	Undetermined
07115.000733	RS.s. McGill House Site	0.95 miles	Historic 19th Cent.	Not Eligible
---	NYSM Site # 563 Moodna Creek	0.36 miles	Unknown	Unknown

Table: National Register Listed or Eligible Sites within 1 mile of the Moodna AOP 1 Study Area

OPRHP #	Address	Name	Distance to APE	NR Status
07115.000012	NY 94	Edmonston House; 90NR02310	0.95 miles	Listed
07115.000068	Forge Hill Road	Knox Headquarters (John Ellison House); 90NR02311	0.31 miles	Listed
07103.000056	196 Willow Ave	Firthcliffe Firehouse; 90NR03237	0.8 miles	Listed
07103.000089	28-30 Firth St.	Firth Employee Housing #4	0.84 miles	Eligible
07103.000228	128 Willow Ave	---	0.9 miles	Eligible
07103.000234	163 Willow Ave	---	0.83 miles	Eligible

AOP 2 – Firth Cliff Dam

Table: Cultural Resources Surveys Conducted within 1 Mile of the Moodna AOP 2 Study Area

OPRHP Survey #	Title	Authors
99SR50360	Historical Archaeology of the Ellison's Flour Mill at Knox's Headquarters State Historic Site, Orange County, NY	Fisher, Charles L. 1999
00SR51352	Stage 1A Archaeological/Historical Sensitivity Evaluation, Continental Road, Town of Cornwall, Orange County, New York	Greenhouse Consultants Inc. 2000
01SR52172	Stage IB Archaeological Survey, Cornwall High School, Town of Cornwall, Orange County, New York	Greenhouse Consultants Inc. 2001
01SR52173	West Point Pipeline Project, Highlands and Cornwall, New York, Completion Memorandum for Stage 1 Archaeological Testing	University of Massachusetts at Amherst; 2001
02SR52426	Phase I Cultural Resources survey for the West Point Pipeline in Highlands and Cornwall, Orange County, New York	University of Massachusetts at Amherst; 2002
03SR54150	Stage IA Archaeological Assessment, Proposed Catskill Aqueduct Connection, Village of Kiryas Joel, Orange County, New York	Historical Perspectives, Inc. 2003
04SR55580	Phase IA Literature Review and Sensitivity Analysis and Phase 1B Archaeological Field Reconnaissance Survey, Willow Woods Subdivision, Willow Ave & route 9W, Town of Cornwall, Orange County, New York	CITY/SCAPE Cultural Resources Consultants; 2004
06SR56751	Phase I Cultural Resources Survey, Site Assessment and Site Identification Phases, Proposed Cornwall Commons Development, Town of Cornwall, Orange County, New York	Oberon, Stephen J. 2006
06SR58156	Phase 1 Archaeological Assessment, Holloran Road and Clara Avenue, Town of Cornwall, Orange County, New York	Greenhouse Consultants Inc. 2006
08SR57981	Phase IA Literature Review and Sensitivity Analysis and Phase IB Archaeological Field Reconnaissance Survey, New Windsor Seniors, Windsor Highway, Town of New Windsor, Orange County, New York	CITY/SCAPE Cultural Resources Consultants; 2008

08SR58298	Phase I Archaeological Investigation for the Proposed Knox Village Senior Housing, Vails Gate, Town of New Windsor, Orange County, New York	Tracker Archaeology Services, Inc. 2008
08SR58380	Archaeological Refinement Study, Proposed Catskill Aqueduct Connection, Village of Kiryas Joel, Orange County, New York	Historical Perspectives Inc. 2008
10SR59902	Amber Grove Site, Phase 1A Literature Review and Sensitivity Analysis & Phase 1B Archaeological Field Reconnaissance Survey, Blooming Grove Turnpike and Forge Hill Road, Town of New Windsor, Orange County, New York	CITY/SCAPE Cultural Resources Consultants; 2010
17SR00661	Addendum to Stage 1A Archaeological Assessment Proposed Catskill Aqueduct Connection Village of Kiryas Joel, Orange County, New York	Historical Perspectives, Inc. 2004
17SR00664	Phase IB Archaeological Investigation, Catskill Aqueduct Connection, Phase II Transmission Line, Towns of Cornwall and New Windsor, Orange County, New York	Historical Perspectives, Inc. 2017
17SR00765	Phase I Reconnaissance Survey Proposed Vails Gate Bypass, Palomino and Holloran Roads, Towns of New Windsor and Cornwall, Orange County, New York	Historical Perspectives, Inc. 2017

Table: Archaeological Sites within 1 mile of the Moodna AOP 2 Study Area

OPRHP Site #	Site Name	Distance to APE	Period(s)	NR Status
7103.000253	Woodward Historic Site	0.47 miles	Historic, 19th Cent.	Not Eligible
7115.000705	Cornwall Commons Stray #2	0.89 miles	Prehistoric	Not Eligible

Table: National Register Listed or Eligible Sites within 1 mile of the Moodna AOP 2 Study Area

OPRHP #	Address	Name	Distance to APE	NR Status
7103.000232	142 Willow Ave	---	0.56 miles	Eligible
7103.000234	163 Willow Ave	---	0.54 miles	Eligible
7103.000054	66 Willow Ave	Oliver Brewster House; 90NR03054	0.72 miles	Listed

7103.000056	196 Willow Ave	Firthcliffe Firehouse; 90NR03237	0.34 miles	Listed
7103.000228	128 Willow Ave	---	0.59 miles	Eligible
7115.000068	Forge Hill Road	Knox Headquarters; John Elliston House; 90NR02311	0.31 miles	Listed
7103.000055	66 Willow Ave	Brewster Barn	0.77 miles	Listed
7103.000062	NY 32	Woodruff House; 90NR03061	0.13 miles	Listed
7103.000202	80 Quaker Ave	---	0.64 miles	Eligible
7103.000001	Quaker Ave	Friends Meeting House; 90NR02291	0.68 miles	Listed
7103.000089	28-30 Firth Street	Firth Employee Housing #4	0.27 miles	Eligible
7103.000218	68 Laurel Ave	Daniel Sutherland House; 90NR03057	0.44 miles	Listed
7115.000012	NY 94	Edmonston House; 90NR02310	0.83 miles	Listed

AOP 3 – Orr's Mills Dam

Table: Cultural Resources Surveys Conducted within 1 mile of the Moodna AOP 3 Study Area

OPRHP Survey #	Title	Authors
00SR51352	Stage 1A Archaeological/Historical Sensitivity Evaluation, Continental Road, Town of Cornwall, Orange County, New York	Greenhouse Consultants Inc. 2000
01SR52172	Stage IB Archaeological Survey, Cornwall High School, Town of Cornwall, Orange County, New York	Greenhouse Consultants Inc. 2001
01SR52173	West Point Pipeline Project, Highlands and Cornwall, New York, Completion Memorandum for Stage 1 Archaeological Testing	University of Massachusetts at Amherst; 2001
02SR52426	Phase I Cultural Resources survey for the West Point Pipeline in Highlands and Cornwall, Orange County, New York	University of Massachusetts at Amherst; 2002
03SR54150	Stage IA Archaeological Assessment, Proposed Catskill Aqueduct Connection, Village of Kiryas Joel, Orange County, New York	Historical Perspectives, Inc. 2003
04SR55580	Phase IA Literature Review and Sensitivity Analysis and Phase 1B Archaeological Field Reconnaissance Survey, Willow Woods Subdivision, Willow Ave & route 9W, Town of Cornwall, Orange County, New York	CITY/SCAPE Cultural Resources Consultants; 2004
06SR56751	Phase I Cultural Resources Survey, Site Assessment and Site Identification Phases, Proposed Cornwall Commons Development, Town of Cornwall, Orange County, New York	Oberon, Stephen J. 2006
06SR58156	Phase I Archaeological Assessment, Holloran Road and Clara Avenue, Town of Cornwall, Orange County, New York	Greenhouse Consultants Inc. 2006
08SR58380	Archaeological Refinement Study, Proposed Catskill Aqueduct Connection, Village of Kiryas Joel, Orange County, New York	Historical Perspectives Inc. 2008
17SR00661	Addendum to Stage 1A Archaeological Assessment Proposed Catskill Aqueduct Connection Village of Kiryas Joel, Orange County, New York	Historical Perspectives, Inc. 2004
17SR00664	Phase IB Archaeological Investigation, Catskill Aqueduct Connection, Phase II Transmission Line, Towns of Cornwall and New Windsor, Orange County, New York	Historical Perspectives, Inc. 2017

17SR00765	Phase I Reconnaissance Survey Proposed Vails Gate Bypass, Palomino and Holloran Roads, Towns of New Windsor and Cornwall, Orange County, New York	Historical Perspectives, Inc. 2017

*****There are no previously documented archaeological sites within 1 mile of AOP 3**

Table: National Register Listed or Eligible Sites within 1 mile of the Moodna AOP 3 Study Area

OPRHP #	Address	Name	Distance to APE	NR Status
7103.000008	70 Angola Rd	Wensyl Res; David Sutherland House 90NR03058	0.77 miles	Listed
7103.000013	Angola Rd	Cromwell Manor Retirement House; 90NR03229	0.7 miles	Listed
7103.000014	32 Angola Rd	Daniel Sutherland House – David Cromwell House	0.7 miles	Listed
7103.000019	101 Angola Rd	---	0.75 miles	Eligible
7103.000042	Old Pleasant Rd	Isaac Cocks House (Kellogg Residence) 90NR03064	0.59 miles	Listed
7103.000112	76 Angola Rd	The Edelweiss	0.74 miles	Listed
7103.000116	Old Pleasant Hill Rd	Hatch Mansion	0.55 miles	Listed
7103.000124	Orrs Mills Rd	Cocks House	0.59 miles	Listed
7103.000232	142 Willow Ave	---	0.91 miles	Eligible
7103.000234	163 Willow Ave	---	0.83 miles	Eligible
7103.000242	26 Old Pleasant Hill Road	---	0.53 miles	Eligible
7103.000243	473 Orrs Mill Rd	---	1.03 Miles	Eligible
7103.000054	66 Willow Ave	Oliver Brewster House; 90NR03054	1 mile	Listed
7103.000056	196 Willow Ave	Firthcliffe Firehouse; 90NR03237	0.87 miles	Listed
7103.000228	128 Willow Ave	---	0.85 miles	Eligible

7103.000055	66 Willow Ave	Brewster Barn	1 mile	Listed
7103.000062	NY 32	Woodruff House; 90NR03061	0.65 miles	Listed
7103.000202	80 Quaker Ave	---	0.41 miles	Eligible
7103.000001	Quaker Ave	Friends Meeting House; 90NR02291	0.51 miles	Listed
7103.000089	28-30 Firth Street	Firth Employee Housing #4	0.68 miles	Eligible
7103.000079	105 Angola Rd	Patrick Pigott House (Angola House) 98NR01379	0.75 miles	Listed
07103.000042	Old Pleasant Rd	Kellogg House 00NR01693	0.7 miles	Listed
07103.000060	Orr's Mills Road and Rt. 32	Moodna Mansion	0.05 miles	Eligible
07103.000059	Orr's Mills Road and Rt. 32	Orr's Summerhouse (possibly demolished)	0.05 miles	Eligible
07103.000063	NYS Rt. 32	Orr's Mill	0.05 miles	Eligible
07103.000246	NYS Rt. 32 and Orrs Mills Road	William Orr House	0.05 miles	Eligible

Rondout Creek

Table: Cultural Resources Surveys Conducted within 1 mile of the Rondout Creek Study Area

OPRHP Project #	Title	Authors
17SR00800	Reconnaissance Level Survey of Archaeological Resources in the City of Kingston	Diamond 1990
01SR51984	Phase IA Report for Archaeological Potential Sensitivity Assessment and Phase IB Field Investigation, Eddyville Mine, Town of Ulster, Ulster County, New York.	Hartgen Archaeological Associates, Inc.
02SR53160	Phase IA Literature Review and Sensitivity Assessment of PIN 8757.10, Abeel Street Reconstruction Project, City of Kingston, Ulster County, New York.	Hartgen Archaeological Associates, Inc.
02SR53159	Phase IB Archaeological Field Reconnaissance of PIN 8757.10, Abeel Street Reconstruction Project, City of Kingston, Ulster County, New York.	Hartgen Archaeological Associates, Inc.
18SR56595	Phase IA Archaeological Assessment of the Landau Solar, LLC Project, Town of Eddyville, Ulster County, NY	Karen Mack and Jennifer Larlee, TRC
19SR00002	Phase I Archaeological Assessment of the Landau Solar, LLC Project, East of State Route 32 & West of State Route 213, Town of Ulster, Ulster County, New York.	Karen Mack and Jennifer Larlee, TRC

Table: Archaeological Sites within 1 mile of the Rondout Study Area

OPRHP Site #	Site Name	Distance to APE	Period(s)	NR Status
11118.000009	Native American Skull Finds	0.74 miles southwest	Unknown Prehistoric	Undetermined
11118.000044	Eddyville Precontact Quarry Site	0.63 miles north	Prehistoric	Undetermined
11140.00109	11-H-122	0.9 miles east	Historic	Undetermined
---	NYSM LP Site No. 784	0.16 miles south	Unknown	Undetermined
---	NYSM LP Site No. 5060	0.13 miles north	Unknown	Undetermined

Table: National Register Listed or Eligible Sites within 1 mile of the Rondout Study Area

OPRHP #	Address	Name	Distance to APE	NR Status
11118.000080	---	Route 213 Bridge over Rondout Creek	0.18 miles	Eligible