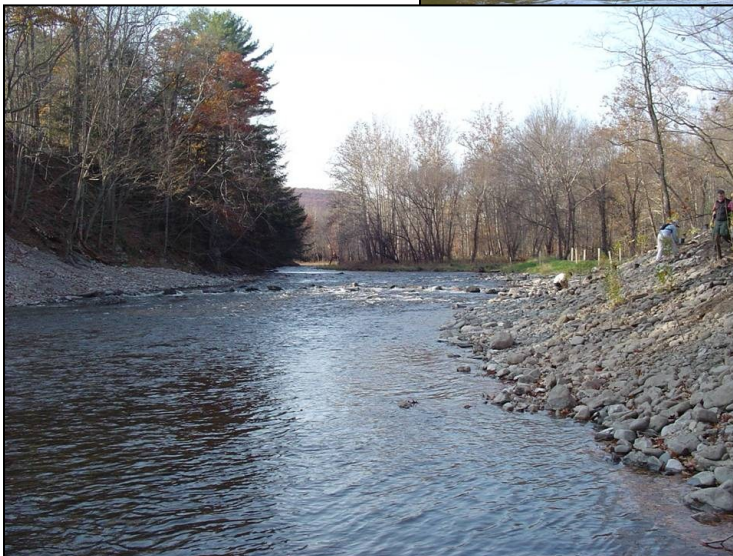


Dam Removal and Barrier Mitigation In New York State

Final Draft Guidance for Dam Owners and
Project Applicants



New York Barrier Mitigation Forum of the
New York State Nonpoint Source Hydrologic and Habitat Modification Workgroup
New York State Department of Environmental Conservation
Final Draft – [See Disclaimer](#)

Photo Credits and Disclaimer

Cover photo credits: Our thanks to Mari-Beth DeLucia with The Nature Conservancy and the United States Army Corps of Engineers for the pictures on the front cover of this document. These portray removal of the Southwest Cuddebackville Dam on the Neversink River, the headwaters to the Delaware River in Orange County, NY. Many lessons were learned from this historic event of removing a dam in New York State for the purpose of environmental restoration.

Top picture: A view of the barrier before removal.

Right picture: The breach of dam commences, September 2004.

Bottom picture: A view of river immediately after removal and restoration.

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Stephanie Lindloff, American Rivers

DISCLAIMER: This document is a “Work in Progress.” It is a final draft document that is intended to be updated and improved online as the DEC gains more experience in removing dams and mitigating stream/river barriers in New York State. We welcome constructive comments and suggestions from any stakeholders (federal, state and local agencies, non-for-profit conservation and watershed groups, dam owners, academic institutions, etc.) for improving its contents. Email your input, with your name and contact information, to the DEC Division of Water email box:

dowinfo@gw.dec.state.ny.us and cite “Dam Removal/Barrier Mitigation Guide Comments for NPS Section” in the subject line of your email.

¹ USFWS photos were taken from its 2008 report [A Strategy for Removing or Mitigating Dams in New York State and Lessons Learned in the Upper Susquehanna Watershed](#), which was prepared for DEC with Section 319 Environmental Protection Agency funding.

General Steps for Dam Removal & Barrier Mitigation Projects in NY

This list summarizes the steps and tasks discussed in this Guide. Links help the reader navigate to essential details for preparing a dam removal or barrier mitigation project.

[Step One: Consider Your Options and Who Can Help You](#)

1. Learn your regulatory responsibilities/liabilities for owning the dam (or barrier) and possible project options for removal or mitigation
2. Consider project types and who could be affected
3. Apply [Site Assessment Tools](#)
4. Find help from technical (and funding) assistance/service providers ([TAPs](#))
5. Establish a project manager or team to help you with your project

[Step Two: Research, Plan and Design Project](#)

1. Understand key project elements – [Questions](#) to understand possible impacts of the project and big issues to consider ([sediment management](#), [historic resources](#) and [infrastructure](#)), which can greatly impact the time frame and cost
2. Assess funding options for your project location
3. Understand the regulatory time frames for obtaining permits including the very important [Pre-Application Conference](#) with the local DEC Permit Administrator
4. Visit the site to plan next steps with key stakeholders and take site photos
5. Garner stakeholder and community support
6. Plan for land ownership requirements prior to dam removal
7. Develop conceptual design and feasibility study

[Step Three: Prepare Permit Application Package](#)

1. Determine preferred alternative and get funds to implement and construct project
2. Prepare final engineering design and complete project specifications
3. Provide any engineer’s cost estimate for construction
4. Prepare applications for required permits and regulatory approvals

[Step Four: File All Required Permit Applications and Comply with Permit Review and Issuance Procedures](#)

1. File all required regulatory permits applications
2. Hold public information meetings (optional)
3. Attend any required public hearings
4. Address public and regulatory agency comments and permitting conditions

[Step Five: Implement Project and Consider Any Post-Removal/Mitigation Measures](#)

1. Remove or relocate any public infrastructure (utilities, roads, etc.)
2. Use planned staging, phasing and erosion and sediment control measures to prevent release of sediments into waterway
3. Restore riparian corridor

Acknowledgements

NYS Barrier Mitigation Forum

In 2006, the NYS Nonpoint Source Hydrologic and Habitat Modifications Workgroup called together a forum to discuss issues and needs pertaining to dam removal and barrier mitigation in NYS. The Forum met three times and then challenged a smaller group of collaborators to develop a dynamic “working” applicant’s guide, which would be improved as the State gained experience in actually removing dams. Forum members represented federal and state agencies and non-governmental/academic organizations as follows:

Federal agencies: United States (U.S.) Environmental Protection Agency (Region 2) - Frederick Luckey; U.S. Fish and Wildlife Service (Cortland) - Anne Secord and Gian Dodici; U.S. Geological Survey - Mike McHale.

New York State agencies: Department of State - Ken Smith; Thruway Authority/Canal Corp (Environmental Services Bureau) - David Curtis and Howard Goebel; and Department of Environmental Conservation (DEC) *Division of Environmental Permits* - Robert Ewing; *Division of Fish and Wildlife and Marine Resources* - Patricia Riexinger and Doug Sheppard (Habitat Section); *Hudson River Estuary Program* - Erony Whyte; and *Division of Water* - Alon Dominitz, Randall J. Passmann, and Scott Braymer (Dam Safety Section); Bill Nechamen and Jaime Ethier (Floodplain Management Section), and Gerry Chartier and Louise King (Nonpoint Source Section; Louise King led the 2006 NYS Barrier Mitigation Forum).

Non-governmental/academic organizations: American Rivers - Stephanie Lindloff; Bard College – Daniel Miller; Environmental Defense - Jake Kritzer; New York Rivers United - Bruce Carpenter and Chris Stephens; Trout Unlimited (NYS Council) - Roy Lamberton; The Nature Conservancy - Mari-Beth DeLucia.

SPECIAL THANKS from Louise King

I would not have been able to complete this guide without the substantive suggestions and feedback from the many reviewers. Comments and suggestions were shared by potential dam owner applicants as well as representatives of State and Federal agencies, non-governmental organizations and county soil and water conservation districts. Significant time and input was invested by key members of the NYS Barrier Mitigation Forum: Mari-Beth DeLucia, Alon Dominitz, Jaime Ethier, Stephanie Lindloff, Randall J. Passmann, Anne Secord, Doug Sheppard and Chris Stephen, as well as Debra Dunbrook and Andrea Sheeran from DEC Division of Permits. Also, Bethany Bearmore from the National Oceanic and Atmospheric Administration (NOAA) recently provided the [example](#) of tasks for a feasibility study. I thank you all for the team work and effort. I expect that this Guide will be improved as the State permits more dam removal and barrier mitigation projects. In the meantime, it is a good start toward informing the owners of dam and barriers and their technical assistance providers (TAPs) on how best to navigate these projects through permitting and approval processes in New York State.

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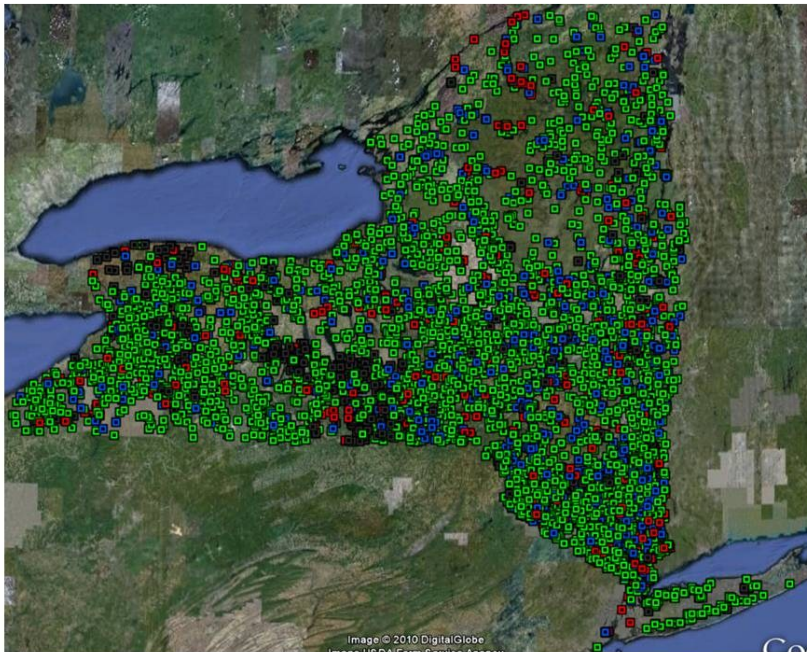
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Introduction

This guide provides information for applicants with an interest in removing a dam or implementing an aquatic barrier mitigation project in New York State. It has been developed by the **New York State Department of Environmental Conservation (DEC)** in collaboration with dam owners, conservationists and regulatory agencies. DEC recognizes that with increasingly significant maintenance and repair costs, barrier mitigation and dam removal, in particular, could become cost effective management options for public and private dam owners.

The information in this guide is designed to help dam owners find assistance from public and/or private partners (project sponsors/technical service providers) who could assist them in mitigating a barrier or removing a dam. The guide provides basics on how these projects are permitted and implemented in New York State as well as the typical project design process, meeting regulatory requirements and mitigating impacts to the environment. The process is fluid; suggested steps may be ordered differently for a particular barrier mitigation project due to land owner preferences and the unique scope, scale and complexities of the project. The guide's lists of technical assistance providers, potential funding sources, assessment tools and references may aid in developing project options.

Acronyms in **Bold Type** are defined on inside of the back cover to this guide.



DEC Google Maps & Earth webpage: NYS Dams Inventory (See [online](#)). Photo credit: DEC

There are over 5,500 dams in New York State. Dams have been built to serve specific purposes, such as for recreation, fire suppression, farms, flood control, irrigation, water supply, hydroelectric power generation, fish and wildlife propagation, and navigation. However, as the years pass, dams may no longer serve the purposes for which they were originally built. They can fall into disrepair, raising concerns that they could pose risks to human life, property and

environmental integrity should the structure fail. Removing dams returns streams and rivers to their natural “free flowing” state, and is becoming a favorable stream restoration strategy among water resource and conservation professionals.

This “Working Document” is an interim step toward the development of a formal **DEC** guide on regulatory requirements for conducting barrier mitigation projects in NYS. The DEC welcomes constructive comments and suggestions from any stakeholders (federal, state and local agencies, non-for-profit conservation and watershed groups, dam owners, academic institutions, etc.) for improving the contents of this guide. Comments should be emailed to: DEC Division of Water (dowinfo@gw.dec.state.ny.us). Cite “Dam Removal/Barrier Mitigation Guide Comments for NPS Section” in the subject line of your email. As the State gains experience with the removal of barriers from its waterways, information in this document, particularly that regarding the various approaches to barrier mitigation that involve dams, is expected to be updated on the DEC website. Regulatory requirements for projects with a non-dam structure, i.e., a barrier, are expected to be developed similar to dam removal projects, except 6 NYCRR Part 673 Dam Safety Regulations would not apply.

Implementing Dam Removal, Fish Passage and Barrier Mitigation Projects in New York

A dam removal or barrier mitigation project can take several years from initial considerations to actual project implementation. The length of time depends on the scale, scope and features of the dam removal or barrier mitigation project. The site-specific complexities of a project will be identified as a dam owner works with project partners, stakeholders and regulatory agencies to develop the project plan. All necessary permits and approvals must be obtained before actual construction (and post-construction) activities are started. Depending on the scope of the project an engineer is most likely needed to complete the design feasibility study, project cost analysis, standards and specifications for preferred design plan and to oversee implementation. However, project costs can be reduced by planning ahead and partnering with technical assistance/service providers (**TAPs**), to gather necessary data.

This guide provides some ideas for project development and implementation, but it is not intended as a comprehensive guide. Each barrier mitigation project involves unique site-specific features, regulatory requirements and details for implementation and post-construction channel/riparian restoration. It is very important to note that in most cases applicable regulatory permits *will* be required prior to removing an existing dam.

Step One: Consider Your Options and Who Can Help You

Why not removal or mitigation? What are your responsibilities/liabilities?

The New York State Environmental Conservation Law (**ECL**) and Dam Safety Regulations (**6NYCRR** Part 673 – “Part 673”) require that the owners of all dams located in New York State operate and maintain their dams in a safe condition at all times. The revised Part 673 regulations

went into effect August 19, 2009. Now that they are in effect, dam owners face **DEC** fines and penalties if found in non-compliance with these requirements.

Dam owners of Class C-High Hazard and Class B-Intermediate Hazard dams must develop, maintain and follow an **Emergency Action Plan (EAP)**, which is to be implemented in the event of a developing dam failure or other uncontrolled release of stored water. The *Guidance for Developing an Emergency Action Plan* (Technical Operating Guidance Series 3.1.3) has been developed to help dam owners prepare the EAP for their dam and is used by DEC Dam Safety staff in the review of an EAP.

A dam owner should become familiar with guidance, which can be downloaded from the [DEC Dam Safety web page](#). This page features the regulations and guidance, such as, the *Owners Guidance Manual for the Inspection and Maintenance of Dams in New York State* and the *Guidelines for the Design of Dams*.

Some dam owners may decide that it is no longer cost effective to operate and maintain their dam in compliance with the ECL and Part 673. Implementing traditional options (repair, replacement or redesign) may not be as feasible as breaching or removing a dam. An added benefit of dam removal may be the revival of a stream or river and its ecosystems. That is, this approach can return a dam site to a faster, free-flowing stream and, along its riparian corridor, restore healthy wetlands and habitats that support diverse aquatic and terrestrial life in and along the river.



Often, the public at-large as well as sporting and recreational enthusiasts support dam removal, preferring to restore a natural river channel and riparian corridor.



A dam will fail if not maintained. Pictured are 3 views of the first manmade barrier upstream from the Hudson River on the Quassaick Creek (Orange County, NY). The dam before 2006 (far top right) was known to have contaminated sediment in the impoundment. Above are 2 views of the dam after it breached during the 2007 floods. Photo credit: DEC Hudson River Estuary Program

Barrier mitigation projects can have very positive impacts on local economies and communities, returning a “sense of place” along waterways where residents from the community and visiting tourists want to hike, bike, fish and enjoy an area. Projects can also have positive effects on the community’s ability to manage its floodplain and prevent water pollution and potential storm damages (in cases where a dam is presenting a hazard or is in disrepair and could otherwise fail).

Dams and poorly designed/sized culverts and bridges (barriers) in our waterways and streams create negative impacts to riverine ecosystems. As these fragment the landscape, streams experience declines in the biodiversity of fish, macroinvertebrae (which are lower in the aquatic food chain, but extremely important to fish survival) and wildlife. Dams prevent fish stream movement, which limits access to spawning grounds, as well as limiting gene pool diversity. This is a real and significant problem for species, such as Brook Trout (our state fish), which is continuing to lose habitat because of barrier problems, especially culverts. Removing barriers to upstream movement of cold water species will become even more important as streams warm from climate change. Cold water species sensitive to slight warming will likely need to find higher elevation cold water refuge habitats, which can often be blocked by barriers. Dams also interrupt the migration of diadromous fish and resident aquatic species to upstream habitats for spawning and survival.

Dams cause rivers to slow down and drop sediments (which can be contaminated) in the upstream impoundments. Water quality is impacted as summer temperatures warm these impoundments and slower moving waters. Conditions in these waters reduce natural levels of dissolved oxygen and cause eutrophication. As a result of these changes, aquatic species that once thrived in rivers, can become extinct.



City-owned, Chase Hibbard Dam is a barrier to riverine fish and stocked American Shad on the Chemung River in Elmira (Chemung County, NY). An American Shad restoration and recreational waterfront project is planned to benefit the community. Photo credit: USFWS



NYSEG-owned Center Village Dam is a non-functioning dam & partial barrier to navigation (boating obstruction) on main stem Susquehanna River (Broome County, NY). American Shad restoration is possible. Photo credit: USFWS

Dam removal proponents must also consider downstream impacts that may result from the loss of peak-flow attenuation by the dam impoundment. This may result in more frequent nuisance flooding, or more severe flooding, along downstream reaches of the stream. Dams also trap and retain coarse bed load and large floating debris. Removal of such a trap may significantly increase the potential for blockage of bridge or culvert openings and water intakes.

Dams and poorly designed/sized culverts and bridges (barriers) in our waterways and streams create negative impacts to riverine ecosystems. As these fragment the landscape, streams experience declines in the biodiversity of fish, macroinvertebrae (which are lower in the aquatic food chain, but extremely important to fish survival) and wildlife. Barriers prevent in stream movement of both diadromous and resident fish. This can limit access to spawning grounds, seasonal access to thermal refuge, as well as limiting gene pool diversity. This is a real and significant problem for species, such as Brook Trout (our state fish), which is facing continuing habitat reductions because of barrier problems, especially culverts. Many species of wildlife are also impacted by barriers. Many herpetofauna, like turtles and stream salamanders, move up and down stream corridors. Barriers to herpetofauna movement often result in the animals moving out of the stream and across roadways. Many of those individuals are killed by passing vehicles.

Upstream effects, aside from raising water surface elevations within the area of the impoundment, may propagate to the next hydraulic control point or throughout the upstream watershed. The crest or spillway of a dam establishes the local base level for erosion of the channel. Many dams that are now candidates for removal have been in place long enough to have made this control significant. Removal of the dam lowers this base level control to the downstream bed elevation. This can result in head-cutting and upstream bed degradation in the stream that can progress upstream well beyond the apparent limit of any pond behind the dam. The resulting degradation can endanger bridge foundations, undermine retaining walls, expose buried utility crossings, and over-steepen and destabilize banks. The impacts at a specific site, like a bridge, may not be seen until years after the dam removal.

Does your dam fit a common type of dam removal or barrier mitigation project?

The four most commonly proposed barrier mitigation projects are: Complete Removal, Partial Removal, Performance Alteration, or Temporary/Seasonal Passage. The latter type is for providing fish passage only and does not change the dam structure. These are briefly described below with pictured examples:

1. **COMPLETE REMOVAL** – Under this alternative, the proposed project would remove the dam and any associated structures. No remnant of the dam would remain whatsoever, and the natural stream channel would be restored once the project is completed.

New York State has limited experience with complete dam removal for the purpose of restoring the dam site and the river corridor to a free-flowing stream with healthy habitats. Completed projects have been complicated, learning experiences for both the project applicant/team and involved regulatory agencies. There has been a steep learning curve in how these projects can best be implemented and how State and Federal agencies

regulate such projects in New York. Actually, this Guide originated from the need to inform dam owners on what to expect when proposing such projects. As more projects are permitted and constructed, any streamlining of the permit process and acceptance of controls and measures should be reflected in this Guide. Practices which protect water quality and provide ecological benefits to the community while minimizing project impacts and costs to the dam owner should be promoted



Fort Covington Dam on the Salmon River in Fort Covington (Franklin County, NY). The dam was removed June and July 2009. The deteriorated 10-foot dam was a barrier to fish and navigation. Its removal eliminated a public safety hazard, reduced local flooding and opened up more than 35 miles of river for migratory and resident fishes. Photo credit: Town of Fort Covington

[The Fort Covington Dam Removal project](#) began in 2001 and was completed in 2009. The dam represented a public safety hazard to the town and was the first barrier on the Salmon River about five miles upstream of the Salmon River’s confluence with the St. Lawrence River. Its removal has removed the safety hazard, enhanced recreational boating opportunities, and reestablished fish access to more than 35 miles of the Salmon River and tributaries.

It took a long time to develop and implement the project due to unexpected findings, permitting delays and funding challenges. It was more costly than one would expect. Expenses for key project elements were about \$100,000 for design and permitting, \$290,000 for construction of dam removal and \$200,000 for new hydrant extensions and removal and relocation of the water main.

The July 1, 2009 press release from American Rivers lists the many partners and funders for the planning/design and construction phases of the project. The amount of awarded funds ranged from \$200,000 to \$5,000. Large contributors included the USFWS’s Fish Enhancement Mitigation and Research Fund, NYS Department of State/NOAA, State Senator Elizabeth Little, American Rivers/NOAA and the FishAmerica Foundation. [The entire list of partners and funders](#) included conservation organizations, government agencies, private foundations, industry and academia.

Below are pictures of the LaSalle Dam site. Bond Act moneys were available for project.



LaSalle Dam on the Great Chazy River in Town of Altona, (Clinton County, NY). The left picture was taken of the dam before its removal on August 23, 2010. The right picture shows stream corridor on September 1, 2010. The failing dam was a barrier to fish and navigation. Its removal eliminated a public safety hazard and reduced local flooding. Photo credit: DEC Region 5

2. **PARTIAL REMOVAL** – This option for a proposed barrier mitigation project involves removing a portion of an existing structure so that some structural features would remain (e.g., a historic dam **abutment**, **rip rap** in abutment areas, anything constricting or changing stream **hydraulics**).



Partial dam removal at the Pursel Mill Dam on Lopatcong Creek in Phillipsburg, NJ. Portions of the spillway and abutments were retained for historic purposes. Photo credit: American Rivers

3. **PERFORMANCE ALTERATION** – This option, involves modifying an existing spillway to promote or add a new permanent **fish passage** or in some way change the performance of an existing barrier structure.

An example of a performance alteration in New York State is one completed in 2010 along the Peconic River in the Town of Riverhead (in Suffolk County on the east end of Long Island). After nearly 10 years and \$1million invested in planning and construction, alewife and American eels have permanent access to over 24 acres of prime spawning, feeding, and rearing habitat in the Peconic River, the main tributary of the Peconic Estuary, an “Estuary of National Significance.” The [temporary fish passage at the North Spillway](#) in Grangebél Park was replaced by a permanent rock ramp at the Park’s South

Spillway. The project permanently re-opened 1.5 miles and 24 acres of diadromous fish habitat. The Peconic Estuary Program website displays a [slide show of project construction](#) of the *North Spillway Repair and the Rock Ramp Fish Passage Project at the South Spillway*. Pictures in the slide show were taken by Byron Young, a former DEC fisheries biologist. Design and construction of the permanent fish rock ramp structure met NYS Dam Safety requirements.

A second example of a performance alteration is the fish ladder pictured below. This project was completed by the Long Island South Shore Estuary Reserve Office.



Long Island's first permanent fish ladder, installed March 2008. Hards Lake Dam spillway on Carmans River in Suffolk County's Southern Park, Brookhaven NY This ladder opens up several miles of spawning habitat for anadromous fish, such as alewives and trout. Photo credit: Long Island South Shore Estuary Reserve Office

4. *Temporary/Seasonal Fish Passage* – This option involves the addition of a removable **fish ladder or ramp**, using nonpermanent construction that does not impede flow, to create passage



Views of the seasonal Alaskan Steep Pass Ladder along the left approach up the North Spillway in Grangebel Park. This is along the Peconic River in the Town of Riverhead NY in Suffolk County. The ladder, installed every spring since 2000, re-opens 1.5 miles and 24 acres of diadromous fish habitat. [A permanent rock ramp](#) was installed in the other spillway in 2010. Photo credit: DEC Peconic Estuary Program

Have you considered what parties may be affected by the dam removal or mitigation?

The identification of stakeholders –neighbors, community members, non-profit organizations, government agencies and anyone else who will be impacted by the mitigation or removal of a dam – is important in the context of all four options described above. At a minimum, stakeholders would include all property owners adjacent to and upstream and downstream of the dam site, potentially to the next barrier or hydraulic control point. These would include those who actually use the dam impoundment for a water supply, or as a body of water that adds value to their house, or to water livestock, etc. State or locally-owned bridges spanning the stream, roadways adjacent to the stream, utility crossings, industrial and municipal water intakes and discharge points may all be subject to potential impact and their safe and continuing operation during and after any dam removal will have to be assured. These parties, as well as the ways they may be impacted by a proposed mitigation or removal project, need to be identified. It is important to reach out to these parties and engage them in the project; doing so sooner than later can help minimize (but not always prevent) conflict. As difficult as it may seem, reaching out to stakeholders who are opposed to a project is especially critical and skilled facilitators and conflict resolutions specialists can be available to help if necessary (e.g. The Community Dispute Resolution Centers of the NYS Unified Court System - <http://www.courts.state.ny.us/ip/adr/cdrc.shtml>)

Have you applied tools to determine if the dam is candidate for removal or mitigation?

THE UNITED STATES FISH AND WILDLIFE SERVICE (USFWS) SITE ASSESSMENT TOOL:

The USFWS (Cortland, New York office) developed a screening tool for dam removal candidates. The project was supported with Section 319 United States Environmental Protection Agency funding managed by the DEC. The 2008 project report, [*A Strategy for Removing or Mitigating Dams in New York State and Lessons Learned in the Upper Susquehanna Watershed*](#), contains a list of state, federal and local regulatory agencies with jurisdiction over dam removal and related activities and a guide to funding sources which may support dam removal in New York State. The report includes resources and tools that stream professionals and watershed groups can use to remove a dam and documents progress made in NYS by collaborating stakeholders in facilitating dam removals for the restoration of stream corridors for ecological purposes.

A USFWS Site Assessment Tool (in Appendix A of the [USFWS report](#)) was developed for stream professionals to use to screen non-federal dam sites within a watershed for dam removal.² The USFWS study field-tested the tool in nine counties in the Upper Susquehanna watersheds. The results of the study are written up in the report as a case study. Ninety four (94) non-federal dams (with drainage areas greater than 1 square mile) were selected for further study. From these, nine rose to the top as potential candidates for removal for ecological reasons.

² Although the report and assessment tool were developed to support agency professionals with an interest in stream restoration, it emphasizes the need to determine and work with the owner of a dam or barrier that is identified as a candidate for removal, as well as those that benefit from the dam, or have properties adjoining a dam property. It is important to note that a dam or barrier mitigation project will not be implemented without the consent or support of an owner, unless, of course, it is determined by NYS Dam Safety to be an immediate safety hazard.

Although the USFWS Site Assessment Tool was developed for stream restoration professionals, it is a helpful starting point for dam owners gathering data for a potential barrier mitigation project. The data gathered using the screening tool helps identify whether potential regulatory requirements (identified later in this guide) apply to the proposed barrier mitigation project. The tool is useful in collecting basic information on the dam infrastructure and ecological (wetlands, stream class, invasive species), cultural and economic criteria. The footnotes to data categories of the screening tool in Appendix 1 of the USFWS Report include links to web pages for gathering the necessary data. The Tool can be downloaded from the [USFWS web page](#).

Also, noteworthy is the field sheet in Appendix B of the USFWS report. Volunteer watershed groups could use the dam removal field sheets in collecting stream data during stream walks. It can be a beneficial tool for early data gathering, but a stream professional would need to field test the data before using it in design of an actual barrier mitigation project.

As the DEC gains experience with actual dam removal and barrier mitigation projects in New York State, other site assessment tools will be tested and evaluated. [Future updates](#) to this guide should identify these.

U.S. GEOLOGICAL SURVEY STREAMSTATS TOOL: The New York StreamStats is a Web-based Geographic Information System (GIS) application that was created by the U.S. Geological Survey (USGS), in cooperation with Environmental Systems Research Institute, Inc. (ESRI), New York State Department of Transportation (NYSDOT), and the DEC, to provide users with access to an assortment of analytical tools that are useful for water-resources planning and management. The StreamStats application can be used in conjunction with the Site Assessment Tool to characterize the watershed and provide estimations of streamflows.

[StreamStats](#) can be used online to obtain streamflow statistics, basin characteristics, and descriptive information for USGS data-collection stations and user-selected ungaged sites. Streamstats makes the process of computing basin characteristics and streamflow statistics fast, accurate, and consistent. Examples of these characteristics available for New York include drainage area, stream slope, mean annual precipitation, as well as the 100-year flood and mean annual flow. This tool can be accessed through a map-based user interface that appears in the user's [Web browser](#).

Version 2 of StreamStats will be released in 2010 for New York. The new version provides the ability to perform [National Hydrography Dataset \(NHD\) navigation](#), which identifies all NHD flowline, dam, or gages features found upstream or downstream of the user-selected point. StreamStats version 2 also includes the ability to generate terrain profiles along the flow network, raindrop traces, and the ability to estimate flows based on nearby USGS stream gaging station.

Efforts are currently (2010) underway to add [regional curves](#)³ to StreamStats. These regression equations, which estimate bankfull discharge, width, depth, and cross-sectional area as a function of drainage area, were developed for streams in eight hydrologic regions in New York (Mulvihill et al., 2009). When this enhancement is fully operational, StreamStats will automatically calculate bankfull discharge and channel dimensions for **the point on the stream you select, based on the drainage area delineated.** This easy to use tool will expedite the assessment of potential barrier mitigation projects by allowing users to determine if bankfull streamflow and associated channel dimensions upstream and downstream of a dam or barrier are typical of those found in similarly sized naturally flowing streams in the same area. Also, the cross-sectional area model can be used to estimate the elevation of bankfull stage. Once the distance from bankfull stage to the top of the bank is known it will be much easier to assess potential flood hazards.

Would you consider using a project manager or team to help stay the course?

It has been observed that successful barrier mitigation projects often have someone local who is willing to champion the project. This person may be a town official or a home town representative of a [NGO](#) or an employee with the county [Soil and Water Conservation District](#). It is important that this advocate be a good project manager; someone that can work on a dam owner's behalf while proactively and continually engaging and maintaining communications among and between local stakeholders and regulatory agencies. Assigning a project manager to coordinate with people involved with the project is critical to keeping all project components on track.

It is noteworthy to add that a project manager need not be an engineer, although a qualified engineer would definitely have a role to play in many barrier mitigation project elements. Each project can be expected to differ in size and scale and have its own unique issues. These factors must be taken into consideration when choosing a project manager as well as other partners over the course of a project.

A dam owner seeking to implement a good barrier mitigation project with less costs and good public outreach can benefit from having one or more **technical assistance/service providers, TAPS**, to see the project through from start to finish. A team of TAPS with a range of multi-disciplines (planning, fund-raising, hydrology, civil engineering, fluvial-geomorphology, archeology, etc) may prove to be cost-effective in the long run, depending on project size.

Who are possible technical (and funding) assistance/service providers (TAPs)?

The complexity and costs associated with planning, designing and constructing a barrier mitigation project are variable and highly dependent upon site specifics. Generally, cost savings are greater when the dam owner takes the time to conduct a preliminary evaluation of a project's

³ Mulvihill, C.I., B.P. Baldigo, S.J. Miller, D. DeKoskie, and J. DuBois, 2009, Bankfull discharge and channel-characteristics of streams in New York State, U.S. Geological Survey Scientific Investigations Report 2009-5144, 59 p., online only

viability before investing significant sums of money in the design and engineering for the project. Local and regional agencies, non-governmental organizations (NGOs) and others (e.g., watershed groups, colleges) can partner with landowners to provide in-kind services and obtain funding for project components. These funds may be specific to preliminary site-evaluation, design and permitting and/or construction of dam removal or other project elements (e.g., infrastructure relocation). As data requirements are collected and project objectives become clearer, TAPs may also be willing to assist a dam owner in communicating with regulatory agencies and local stakeholders.

This section identifies typical **TAPs** that may serve as a sponsor or partner in exploring options for dam/barrier removal or mitigation. The lists are divided into four categories of technical and/or funding assistance or providers as follows:

1. Local agencies,
2. State agencies/partnerships,
3. Federal agencies and
4. Non-governmental organizations (NGOs).

Local Agencies

COUNTY SOIL AND WATER CONSERVATION DISTRICTS (SWCD) staff can be helpful in working with landowners and municipalities in collecting natural resource data for project sites. County SWCD staff can partner with local watershed groups, planning bodies, and municipalities on specific projects and in identifying watershed priorities for the county through their local county Water Quality Coordinating Committees for a variety of water quality issues. SWCDs may be helpful in considering less costly ways to rehabilitate dams, which may benefit streams and wetlands or provide flood control measures in some site-specific cases. It may provide engineered solutions from the United States Department of Agriculture Natural Resources Conservation Service (see Federal Agencies). To contact your local county SWCD office, go to the [New York State Soil and Water Conservation Committee website](#) for name/address/phone and other contact information for the county where your project will be located.

State Agencies/Partnerships

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION (DEC) staff are located in multiple divisions of the **DEC** central office and its 9 regional offices. These have different levels of expertise, focus and responsibilities in terms of dam removal and barrier mitigation projects. The **Central Office** roles include planning, administration, outreach and training support, reporting on compliance and enforcement activities, and promulgating regulations to implement State environmental law. Central Office staff set policy and establish standards and guidance for pollution prevention (e.g. to reduce water pollution) and to reduce adverse impacts and safeguard public safety from activities in/near natural resources (e.g., to reduce risks of flooding, loss of human life and disturbances to streams, wetlands, and endangered species). In general, staff in each **Regional Office** is engaged in actual permitting, compliance and enforcement activities in counties covered by the DEC Regional Office ([See](#)

[Appendix 1 for contact information](#)). Regional staff may coordinate with Central Office staff on individual site- or type-specific projects, like those involving dam safety requirements.

DEC Divisions involved with barrier mitigation include the Divisions of: Permits; Water (dam safety, floodplain management and nonpoint source/general permits sections); Fish, Wildlife and Marine Resources (landscape conservation/habitat sections); and Operations (for DEC-owned lands). DEC offices⁴ that could provide direction to a barrier mitigation project applicant (or delegated technical assistance or service provider) are:

1. **DEC Division of Water, Dam Safety Section of the Nonpoint Source (NPS/GP) Section:** Staff provided leadership and support for the Nonpoint Source Hydrologic and Habitat Modifications Workgroup. Workgroup members collaborated among federal/state/local agencies, and academic and non-governmental organizations, which have interests in improving and protecting water quality and habitats within stream corridors using sound science and guidance. Staff can direct project applicants to available guidance, technical assistance/service providers and known funding opportunities. For information, email your questions to: DEC Division of Water email box: dowinfo@gw.dec.state.ny.us and cite “Dam Removal/Barrier Mitigation Guide Comments for NPS Section” in the subject line of your email. Be sure to include your contact information (name/phone#) and the names of the county and stream/river of the dam or barrier.
2. **DEC Hudson River Estuary Program, for south Hudson River Basin south of Troy, NY:** Staff provides technical and financial assistance to local watershed partners implementing watershed protection and restoration strategies (e.g., barrier mitigation) in tributaries of the Hudson River. Local landowners and partners in the Hudson Valley interested in dam removal can contact the Estuary Program for assistance. Contact Scott Cuppett. Phone: 845/256-3029. Address: 21 South Putt Corners, New Paltz, NY 12561 - [DEC-HREP Web page](#).
3. **DEC Bureau of Marine Resources Peconic Estuary Program (PEP) on east tip of Long Island, NY:** Staff provides technical and financial guidance and assistance to partners implementing ecosystem-based watershed protection and restoration initiatives within the Peconic Estuary watershed. Dam and culvert owners and landowners who are looking to restore or enhance diadromous fish passage and habitat are urged to contact the PEP. Contact: Laura Stephenson. Phone: 631/444-0871. Address: 205 N Belle Meade Road, East Setauket, NY 11733 - [DEC-PEP Web page](#).
4. **DEC Regional Offices:** Division of Water and Division of Fish and Wildlife staffs offer assistance in understanding regulatory requirements for the project site location, but your first contact is likely to be [the Regional Permit Administrator’s office](#) (Also [See Appendix 1 for contact information](#)).

⁴ DEC staff were key contributors to the USFWS report [Strategy for Removing or Mitigating Dams in New York State and Lessons Learned in the Upper Susquehanna Watershed](#). The strategy cites recommendations that stream practitioners can use during selection of candidate dams for removal, funding sources and regulatory guidance.

The **NEW YORK STATE DEPARTMENT OF STATE (DOS)** can provide technical and financial assistance for barrier mitigation projects through the preparation and/or implementation of Inter-municipal Watershed Management Plans or Local Waterfront Revitalization Plans. Also, the **DOS** Long Island South Shore Estuary Reserve Program actively develops and manages fish passage and barrier mitigation projects within its boundaries. Program website include: [DOS Coastal Online Resources](#) and [LISSER Council Website](#) and [DEC Estuary Management Programs Website](#). Its Office is located at: 300 Woodcleft Avenue, Suite E, Freeport, NY 11520.

Phone: 516-378-2679 – Email: sser@dos.state.ny.us<<mailto:sser@dos.state.ny.us>>

The **NEW YORK NATURAL HERITAGE PROGRAM** is a partnership between the **DEC** and The Nature Conservancy (**TNC**) whose mission is to facilitate conservation of rare animals, rare plants, and natural ecosystems. The Program maintains a comprehensive database on the status and location of rare species and ecosystems for **DEC** and provides information to other state agencies, non-government organizations, private companies and private landowners upon request. Phone: 518-402-8935 - [NY Natural Heritage Program Website](#).

Federal Agencies/Partnerships

The **UNITED STATES DEPARTMENT OF AGRICULTURE (USDA)** at the local level often works very closely with [county Soil and Water Conservation Districts \(SWCD\)](#) across NYS. They are often housed in the same building.

1. The **USDA Natural Resources Conservation Service (NRCS)** can provide engineering services for projects conducted through the county SWCD. The county USDA NRCS District Conservationist in consultation with the NRCS Watershed Engineer can provide project specific engineering services and technical assistance on behalf of the county SWCD. This assistance may be limited as different priorities are set and as funding for the technical assistance allows.
2. **NRCS Wildlife Habitat` Incentives Program (WHIP)** may be used to provide fish passage (perhaps by dam removal) on privately owned dams. These projects would have to compete for the limited funding and for the various wildlife habitat practices throughout the state.
3. There may be other opportunities for agricultural landowners to apply for various Farm Bill programs to provide ancillary practices near the dam removal site. Generally they would be limited to agricultural lands. To learn more about these programs visit [NRCS online](#).

The **NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA)** Coastal Restoration Centers: (1) fund and implement quality restoration projects to ensure healthy and sustainable fishery resources; (2) employ technical staff to help improve project design, ensure environmental compliance, and advance restoration techniques; (3) engage the local community and encourage stewardship of our nation's coastal and riverine habitats; (4) collaborate with public, private, and agency partners to prioritize projects and leverage successes; and (5) use

scientific monitoring to evaluate restoration project success and ensure the efficient use of tax dollars. NOAA Conservation Websites include: [NOAA Habitat Conservation Funding Website](#) and [NOAA Restoration Center Website](#).

1. For NYS projects outside Northern Long Island, Long Island Sound and Bronx River, contact Bethany M. Bearmore, P.E. (Coastal Restoration Specialist, NOAA Restoration Center, James J. Howard Marine Fisheries Laboratory, 74 Magruder Road, Highlands, New Jersey 07732). Phone: 732-872-3069 - Cell: 240-429-4722 - Email: Bethany.Bearmore@NOAA.GOV
2. For Northern Long Island/Long Island Sound/Bronx River, contact: Jim Turek (Assistant Northeast Team Leader, NOAA Restoration Center, 28 Tarzwell Drive, Narragansett, Rhode Island 02882). Phone: 401-782-3338 - Cell: 301-346-8424 - Email: James.G.Turek@noaa.gov

The **UNITED STATES FISH AND WILDLIFE SERVICE (USFWS)** National Fish Passage Program provides funding and technical assistance to remove barriers, or to develop fish passage structures at barriers. The USFWS New York Field Office (3817 Luker Road, Cortland, NY 13045) has knowledge of fish and wildlife resources in New York and a particular interest in pursuing opportunities for improving fish passage and restoring the State's streams and rivers. The New York Field Office can provide information on USFWS funding available to facilitate fish passage and can also enlist the support of Regional USFWS engineers that have experience in the design of fish passage structures. Contacts: Anne Secord or Stephen Patch or Carl Schwartz. Phone: 607-753-9334 – Online resources: [USFWS NY Field Office web page](#) and [USFWS Fisheries and Habitat Conservation](#) and [USFWS Hudson River Natural Resources Damage Report](#)

The **UNITED STATES GEOLOGIC SURVEY (USGS)** (425 Jordan Road, Troy, NY 12180) can provide surface water, groundwater, water quality, and biological data as well as geologic and mapping information. USGS can also provide technical assistance including help with [its online tools and references](#) stream professionals and TAPs including [StreamStats](#) and [Regional Curves](#). Research assistance including water or sediment quality analysis, streamflow modeling, and more, may also be available through the USGS. Contact the Director, New York Water Science Center, Phone: (518) 285-5658 - Email: dc_ny@usgs.gov; Also, see the [USGS-NYS Website](#).

Non-Governmental Organizations

A wide variety of non-governmental organizations (NGOs) and watershed groups can provide technical assistance to an applicant of a proposed barrier mitigation project. In New York State and surrounding states, a variety of NGOs have acquired significant experience in the technical, regulatory and financial aspects of barrier mitigation as well as coordination of stakeholder meetings and public outreach.

NGOs are interested in working on river restoration projects with private dam owners to address their interests as well as the public interests associated with the river resource. Some may

provide assistance at little or no cost to the dam owner. Typically, an NGO could help coordinate with regulatory agencies to discuss alternatives, to work with dam owners in review of alternatives and in determining dam owner interests and options, and to reach out to other interested parties to encourage community support.

Project activities of an **NGO** could include assistance with:

- Determining type of studies needed to address the public’s long-term objectives and goals at the barrier mitigation site
- Determining dam owner responsibilities associated with desired alternatives
- Evaluating studies within the watershed
- Outreach to seek public support and project funding, if needed
- Navigating the permitting processes
- Coordinating with interested parties to enable their roles in mitigating barriers, or
- Operating competitive grant programs to help dam owners offset the cost of planning, design and implementation of barrier mitigation projects.

Below is a list of NGOs that are known to provide assistance in dam removal and barrier mitigation within NYS:

- **AMERICAN RIVERS (AR)** is a leading national organization fighting for healthy rivers so that communities can thrive. Its River Restoration Program can provide technical and financial assistance to dam owners and communities with an interest in removing stream barriers and restoring rivers and streams. Staff at American Rivers has been involved in the removal of more than 200 dams nationwide, and has considerable expertise in project development and management, feasibility study, engineering design, environmental assessment, project financing, regulatory processes, and public education. Though unable to provide in-depth assistance to all projects, American Rivers is a valuable resource for information relating to dam removals. Contact: Stephanie Lindloff (AR-NY Field Office) Phone: 518-482-2631 – Email: slindloff@amrivers.org - For additional resources view the web pages for [AR Restoring Rivers](#) and [AR/NOAA Community-Based Grants](#).
- The **NEW YORK STATE CHAPTER OF THE CORPORATE WETLANDS RESTORATION PARTNERSHIP (NYCWRP)** has been instrumental in bringing professional, volunteer, and financial resources together to implement high priority, water resource restoration projects. For example, it partnered with others to complete the [Fort Covington dam removal project](#), which is featured on the [NYCWRP home web page](#). Contact the CWRP State Chairman, Terri Doss with BioHabitats ~ tdoss@biohabitats.com
- On Long Island, the **SEATUCK ENVIRONMENTAL ASSOCIATION, IN PARTNERSHIP WITH THE ENVIRONMENTAL DEFENSE FUND (EDF)**, can provide technical support to public and private landowners in development of fish passage projects and monitoring programs to determine project effects on aquatic resources. Assistance can include ecological studies, project prioritization, partnership facilitation, and public outreach. It may identify potential funding sources and develop proposals. Contact: Brian Kelder, Phone: (631) 626-1269 - Email: bkelder@seatuck.org and see [Seatuck Environmental Association website](#) and [EDF online](#).

- [THE NATURE CONSERVANCY website](#) provides contacts for additional information or call: 845-858-2883.
- [TROUT UNLIMITED website](#) is source of contact information for the Northeast.

Other Legal/Technical Service Groups

Other groups to contact locally for assistance would include watershed associations and coalitions, sporting groups, local environmental management councils, conservation advisory councils, county [Water Quality Coordinating Committees](#), and law, water and environmental engineering departments at local colleges. The regional planning boards across the State can refer you to groups to contact as well (see the [New York State Association of Regional Councils web page](#) for contact information).

Dam owners can benefit by thinking broadly when exploring options with local colleges. Many professors want to give students real life experiences to apply newly gained knowledge. Professors and students welcome opportunities to conduct research with landowners. Questions and concerns can be addressed, often at little or no cost to the landowner. Partnerships can be formed by the dam owner with regulatory agencies and technical assistance provider(s) that would guide student(s) to do much of the leg work. These can be win-win approaches since costs are reduced for the landowner and students get college credits and good experience for their resume.

One dam owner noted success in working with classes in departments of horticulture and a law school. The cross-disciplines at the university were able to help dam owners understand site-specific issues of removing their dam.



Moodna Creek Dam in New Windsor. Partial first barrier is upstream of Hudson River due to partial breach (right side of picture) from lack of maintenance. The dam has been under consideration for removal (Orange County, NY). Photo credit: DEC Region 3 Hudson River Estuary Program.

Step Two: Research, Plan and Design Project

Understand Key Project Elements

The time frames for completing steps in the guide can vary greatly depending on the scale and scope of a project and any funding and technical assistance that is available. Some estimates are: [Step One](#) may only take a few weeks; [Step Three](#) and [Step Five](#), a month or two, each; and [Step Four](#), 3 to 6 months - **BUT [Step Two](#) could take months to years.** In fact, how well Step Two is completed will impact the time frame for completing Steps Three, Four and Five. The better prepared you are, the sooner the permit application will likely be considered “complete” under the [Uniform Procedures Act](#) process by the DEC Regional Permits Office. This can help minimize the time frame for obtaining permits and other approvals for the project.

As discussed above, the [Step One](#) phase typically involves a site visit by one or more members of the project team and the completion of a [site assessment](#) to identify site-specific issues for further study. Through the planning and decision-making process in Step Two, a team would formulate clear answers to the following questions and consider any impacts these may have on project design:

1. Are there wetlands?
2. What is the stream classification of the affected stream or river?
3. Does the dam have historic or cultural significance?
4. Are there any endangered or threatened species?
5. Are there invasive species (e.g. water chestnuts, etc.)?
6. Could there be any contaminants present in the sediments behind the dam?
7. Is there public infrastructure (e.g., water or sewer pipes, storm sewer outfalls, telecommunications lines) associated with the dam or barrier or its impoundment?
8. Is there an existing problem with downstream flooding?
9. Are there nearby dams, including beaver dams?
10. Is the dam, impoundment, and/or immediate downstream area mapped by the [Federal Emergency Management Agency \(FEMA\)](#) as a Special Flood Hazard Area?"
11. What construction factors need to be considered (e.g., access for equipment, temporary fills, staging areas for phased construction)?
12. Would the project cause any public controversy? What are the pros and cons of project options?

Any potential adverse impacts associated with these findings would be addressed in project design alternatives.

Reaching out to the DEC regional permit administrator is extremely important in project planning to get advice and determine DEC jurisdiction on various aspects of the project. Depending on the specifics and complexities of the barrier mitigation project, the project sponsor may request a “pre-application meeting” with DEC as part of Step 1 or 2. In some cases it might be best to have DEC at the initial visit, as part of the project team, while in others it might be best to coordinate with DEC after the team has become more familiar with the site. In either case, DEC should be consulted early in the process to obtain their insight and recommendations that will assist in scoping out the project.

Step Two activities do not need to be done in the order you find them in this guide, but certain key elements ([Sediment Management](#), [Historic Resources](#) and [Effects of Infrastructure](#)) are discussed below to encourage consideration early-on in planning process. These elements can affect project design and the time it takes to complete the permitting process (Step Three: Prepare Permit Application Package and Step Four: File All Required Permit Applications and Comply with Permit Review and Issuance Procedures). They can require additional studies and assessments and cause delays in obtaining approvals from non-DEC agencies, e.g., United States Army Corps of Engineers (USACE) and New York State Office of Parks, Recreation & Historic Preservation (OPRHP). Therefore, it is fiscally prudent to address these early since they can cause major delays in the project and its overall cost.

Sediment Management

A river naturally transports sediment, nutrients and woody debris, but dams and associated upstream impoundments block these from moving downstream. The accumulated sediment can be a major concern so both its quantity and quality must be evaluated. Any release of sediment during construction (to remove or breach barrier) from the impoundment behind a dam (or barrier) would increase turbidity in the water and potentially expose aquatic life downstream to any contaminants and toxic substances that have been lying within the sediments.

There are three primary methods for managing sediment during a barrier mitigation project:

- Sediment removal and disposal (placement of 100 cubic yards of fill or less OR 5,000 square feet of excavation or less are considered minor projects requiring DEC Protection of Waters Permit),
- In-stream management (allows the river to naturally redistribute the impounded sediment downstream while forming its own channel through the former impoundment or while flowing through a newly constructed channel) This method would require an Article 15 permit; however, this alternative may or may not be approved depending on the stream's classification and the quantity of sediment to be redistributed downstream. When federal permits are required, a DEC 401 Water Quality Certification are needed prior to construction.
- Capping or in situ remediation may be implemented. Generally, the preferred remedial alternative for any highly contaminated sediment is removal and proper disposal in a regulated and approved hazardous waste disposal facility. EPA approval may be required.

Plans for your project must be developed in consultation with stakeholders and with local, state and federal agencies.

As noted above, allowing the river to “naturally redistribute” impounded sediment should be approached with extreme caution, depending on the volume and type of sediment impounded. If the dam has accumulated significant quantities of trapped sediment, its removal could result in a slug of sediment that will generally redeposit downstream, resulting in filling-in of the stream channel. This can block bridge and culvert openings, resulting in flooding. An oversupply of sediment can also destabilize the channel downstream, causing the stream to relocate itself on the

floodplain, or create multiple channels in the floodplain. Sediment overload can seriously degrade aquatic habitat as well.

The actual removal of a dam (or barrier) could result in the release or discharge of sediment from the impoundment behind the dam into the stream or river. The [DEC Division of Water guidance *In-Water and Riparian Management of Sediment and Dredged Material \(TOGS 5.1.9\)*](#), dated November 2004, would be used by DEC to determine the quality of sediment and appropriate method for disposal of such sediment prior to dam removal or mitigation. This determination would affect project design and implementation. Early in the planning process, the Regional DEC Permit Administrator representative would be contacted ([see Appendix 1](#)) to find out how extensive the study and review of sediment would need to be for the dam site. There will be a need to sample sediment deposits.

Historic Resources

It is wise to evaluate any need for an archeological or historical study as early as possible in the planning process. If the dam or other structures present on your project site are over 50 years in age, or there is likelihood that archeological resources may be present, a cultural resource survey, including a field study of archaeological or historic features, may be required by the [State Historic Preservation Office \(SHPO\)](#) at the [NYS Office of Parks, Recreation and Historic Preservation \(OPRHP\)](#) **before any actual barrier removal activities can be conducted.**

The SEQR lead agency (normally DEC) for obtaining project permits must determine any impacts to historic, cultural and archaeological resources. The DEC would make its determination during the SEQR review of the project [Joint Application](#) package with SHPO. If the DEC is not the SEQR lead agency coordinating a project review, the applicant must work with the SEQR lead agency for the project to submit the *Project Review Cover Form* directly to [SHPO](#). When the DEC has no permit jurisdiction, it does not coordinate the SHPO review. The form and information for this process is on the [OPRHP web page](#). Submitting the SHPO Form would trigger potentially a 2-phased process to determine if any properties that could be affected by the dam removal project are eligible for listing to the National Register of Historic Places.

Consultation regarding significant historic and archeological resources that may be impacted by a proposed project will require an exploration of alternatives that will avoid, reduce, minimize or mitigate the possible damages. The need for the project often comes into play when conducting an evaluation such as this.

Whenever a project involves a Federal agency (for permits or funding), Section 106 of the National Historic Preservation Act (NHPA) requires the permit applicant to coordinate with SHPO. Most dam removal or barrier mitigation projects will be subject to Section 106 because they require a federal permit from the United States Army Corps of Engineers (USACE).

Identifying whether a project area contains historic or archeological properties that could be affected by the dam removal project, and whether these resources are eligible for listing to the [National Register of Historic Places](#), usually involves the work of professional consultants in the field of history and archeology. After information is submitted to the [State Historic Preservation](#)

[Office](#), **OPRHP** staff would advise the project applicant whether additional study may be needed and whether a professional historical consultant or archaeologist may be required to complete the study.

Landowners, however, can do some preliminary work on their own to get a sense of what additional studies may be needed. The applicant may first stop to see the local historical society or town historian, if there is one. These can be a great resource for gathering historical information about the dam, adjacent properties and resources nearby the site. This information would supplement that which you compiled while completing the historic resource criteria using the [USFWS Site Assessment Tool](#) during [Step One](#). Also, the [National Register](#) and related SHPO web pages may be consulted for determining if any National or State register properties are in the project area and if the project area is located on an archeological sensitivity map and considered sensitive for the presence of archeological sites.

When projects are found eligible for listing to the National Register of Historic Places, or have potential to impact sites that are already on the National list, an applicant is required to consult with members of the public to determine project alternatives that could avoid, minimize or mitigate these impacts. After holding public meetings and consulting with the public, a Memorandum of Agreement is developed among federal and state agency stakeholders on the roles each would play to avoid, minimize or mitigate the project impacts to historic resources.

As the state gains more experience with dam removal and barrier mitigation projects, a more streamlined process may be developed to help facilitate projects affecting historic resources. For now, applicants can expect this aspect of the dam removal plan to take 6 months to 1 year.

Effects on Infrastructure

A dam or barrier (e.g., culvert, bridge) in a stream is likely to be a crossing for public infrastructures. These can include: bridge piers, retaining walls, water and sewer mains, dry hydrants, storm sewer outfalls, roads, and telecommunication cables. These may be providing a public service or they may no longer be in use. Similarly, storm sewer or other drainage pipe outfalls that discharge to the impoundment may need to be moved after the dam or barrier is removed. Removal of the dam or barrier could damage infrastructure, leave them high and dry upstream of the barrier, or subject them to the consequences of a free-flowing stream (e.g., sediment transport or streambed-scour). Project design would look at a range of options to address these impacts. Public infrastructure may need to be relocated or removed, or it may be decided that the best approach is to repair the dam and install fish passage instead.

In addition to local public works departments, utility companies (gas, electric, telephone etc.) should be contacted to determine what infrastructure may cross or be adjacent to the stream not only at the dam site but in impacted reaches upstream and downstream. State, local and private bridge and culvert owners with structures that will potentially be impacted should be contacted.

Therefore, it is important to determine what infrastructure exists at the site and who owns it and possible options as early as you can. Contact the local public works department for information

about the infrastructure that may not be visually apparent. You will want to describe in detail the proposed plan for addressing infrastructure in the permit application package.

Determine how your project will be funded

A project applicant will need to seek funding to implement a dam removal or barrier mitigation project. While total project costs cannot be determined until a preferred alternative is known and the final design of the project is planned, the applicant will need to research available funding sources and begin to solidify funding options in advance. The project manager would work with the dam owner and any TAPs to obtain funding. Applications for grants, loans and other funding would be submitted to cover the full scope of the project. Letters of support would be gathered and included with these application packages. Grant awards and funding for the project would need to be in place as progress on the project continues.

While there is no longer specific New York State funding for removing dams, certain federal programs and foundations may supplement the cost of segments of the project. Appendix D of the United States Fish and Wildlife Service (USFWS) report [*A Strategy for Removing or Mitigating Dams in New York State and Lessons Learned in the Upper Susquehanna Watershed*](#) (May 2008) contains an extensive list and matrix of possible funding sources. TAPs may offer possible sources of funding and assist in assessing site conditions as well. Other possible sources of funds may be available through:

1. Corporate Wetland Restoration Partnership (CWRP), a not for profit group combining public and private sector services and resources in efforts to restore wetlands. Projects are chosen by the corporate members. For information, view [CWRP web page](#) and see dam breach by Marines in North Carolina: [CWRP video](#).
2. [*Paying for Dam Removal, A Guide to Selected Funding Sources*](#) by American Rivers was produced in 2000 but still helpful (and see projects on AR [grants map](#) in NYS).
3. [*Private Landowner Network*](#) may also be a source of information on conservation programs and tools for landowners.

Understand the regulatory time frames for obtaining permits

There are a number of federal, state and local regulatory controls in place which may apply to barrier mitigation, removal and construction projects. The dam/barrier owner must apply for and obtain such permits and approvals from the respective agencies with jurisdiction before the project can be implemented. The applicability of these controls to each project depends on the particular circumstances of each case, such as the size and scope of the project, the classification of the affected water body and the environmental conditions at each site. Completion of the [Site Assessment Tool](#) and Step 2 activities, mentioned above, would help identify many particulars early-on.

DEC Regional Permit Administrator Pre-Application Conference

Once the dam owner has a general idea of dam removal or barrier mitigation project objectives, it is time - as a potential permit applicant, to submit a [Pre-Application Conference form](#) and

initiate a meeting with the [DEC Regional Permit Administrator](#). This meeting is critical in determining, and then applying for, the necessary permits for the project site location. The environmental permitting activities of the DEC are administered locally through its Regional Offices, and the Regional Permit Administrator in each DEC Region essentially oversees and helps stakeholders navigate through the process. The dam owner (and any TAP partner the land owner is working with) would meet early-on with the DEC to discuss requirements and key issues.

During your Pre-Application Conference meeting, DEC staff can help you refine project objectives, clarify DEC requirements, get a preliminary reaction to the proposal, and discuss alternative approaches. This can help identify any need for engineering services. Also, DEC staff can advise you on completing forms and any other requirements to complete your application.

Uniform Permitting Procedures and SEQR

The procedures for administering key regulatory permits of the DEC are standardized in the [Uniform Procedures Act \(UPA\)](#) – 6 NYCRR Part 621. The UPA provides time frames and procedures for the DEC review of all applications for permits the DEC could issue. A complete application package includes: the *DEC Joint Application Form*; project location map; project plans; list of other State and Federal agencies with regulatory jurisdiction; and any supplemental information required by the DEC (e.g., an Environmental Assessment Form (EAF) must be completed pursuant to SEQR and submitted with the *DEC Joint Application Form* to address site-specific environmental factors). The list of other agencies with regulatory jurisdiction would include a statement of the permit status for these as well. **When the package is submitted to the DEC, the applicant must also copy and send the entire package to each applicable State and Federal agency that is listed in the *Joint Application Form*.** The applicant must submit all applicable forms simultaneously and follow-up with DEC, and other agencies separately, to obtain necessary permits prior to project construction. Forms (and instructions for completing them) are available from DEC Regional offices and online under [Forms for Permit Applications](#).

A complete [Joint Application](#) package for dam removal or barrier mitigation projects would include applications for *all applicable* DEC permits and permits for certain other agencies (**DOS**, **OGS**, and **USACE**). The applicant would likely need to submit the [Joint Application Part D-1 form](#) titled: APPLICATION FOR PERMIT FOR THE CONSTRUCTION, RECONSTRUCTION OR REPAIR OF A DAM OR OTHER IMPOUNDMENT STRUCTURE. Also, the applicant would want to review requirements of the United States Army Corps of Engineers (USACE) and address these as part of the *Joint Application* package. It is wise to review the requirements of the **New York State Office of Parks, Recreation & Historic Preservation (OPRHP)** as well since the DEC would be responsible for SEQR review and these projects can often involve historical, cultural and archaeological resources. [Appendix 1](#) provides brief descriptions of agencies that potentially would have jurisdiction for a dam removal or barrier mitigation project depending on site location or project factors.

[UPA](#) time frames are triggered once the *Joint Application* package for the project is submitted to the DEC Regional office. The DEC must inform the applicant of whether the application is

“complete” within 15 days. If the application is “incomplete” under the **UPA** process, the DEC will notify the permit applicant with an explanation of what else is needed. These requests can regard programmatic permitting and SEQR requirements. When the applicant replies to the incomplete notice, the same time frame for the DEC review would again apply. This process is repeated until the DEC informs the applicant that the application is “complete.”

The **UPA** divides projects into 2 categories, “minor” and “major,” and sets timeframes for DEC determinations. Generally, a dam removal or barrier mitigation project would be a “major” project. For major projects that require no public hearing – DEC must make a final decision within 90 days after the application is determined to be “complete.” For major projects that require a public hearing, DEC notifies the applicant of the public hearing within 60 days of the “completeness” determination. Once the hearing ends, DEC must issue a final decision on the permit application within 60 days after receiving the final hearing record.

[State Environmental Quality Review Act \(SEQRA\)](#) requirements pursuant to 6 NYCRR Part 617 must be completed on all projects requiring state permits. The SEQRA Lead Agency (i.e., usually DEC, but could be State/local agency with regulatory jurisdiction for the action) must make a determination on whether the action poses a significant impact on the environment. The complete *Joint Application* package (including the Environmental Assessment Form) is used by the DEC (or Lead Agency) to determine if the project is a Type 1 or Unlisted action under SEQR and to assess whether the proposed action may have a significant adverse impact on the environment and may require the preparation of an Environmental Impact Statement. Coastal, historical, cultural, visual, archaeological and other natural resource determinations may be made as part of a SEQR review. There are [online DEC SEQRA tools](#) that project applicants can use to help assess environmental impacts for a site-specific project. The [Site Tool](#) would have helped identify these as well.

Other Regulatory Jurisdictions

As mentioned above,

Appendix 1 – Contact Information for DEC and Other Agencies with Possible Regulatory Jurisdictions identifies other agencies with regulatory jurisdictions that may be applicable to a proposed dam removal or barrier mitigation project. The project applicant is encouraged to obtain any of these applicable approvals by the time any DEC permits are in hand so that project delays in construction and associated costs can be avoided. Two to particularly note are as follows:

SECTION 106 OF THE NATIONAL HISTORIC PRESERVATION ACT: For projects that involve a federal action (permit, funding), it will be necessary to [coordinate with SHPO](#). These projects require determine on whether the properties affected by the dam removal project are eligible for listing to the National Register of Historic Places and whether there is a need to assess possible impacts and alternative measures. This is a federal, not state requirement.

FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA): Under 44 Codes of Federal Regulation 60.3, and adopted into [local municipal flood protection laws](#), any applicant for a [floodplain development permit](#) must notify adjacent communities and the State Coordinating Office (DEC) prior to any alteration or relocation of a watercourse, and submit copies of such notifications to FEMA. The applicant must also assure that the flood carrying capacity within the altered or relocated portion of any watercourse is maintained. Where FEMA has provided a designation of a regulatory floodway in the Flood Insurance Rate Map (FIRM), there must be a determination made that the project will not increase the base flood elevation (elevation of the 1% annual chance flood) by any measurement amount. Should there be an increase in the Base Flood Elevation at any location, the applicant must work with the local community to apply to FEMA for a conditional FIRM revision, fulfill the requirements for such revision, and receive FEMA approval. The DEC Floodplain Management Section can provide guidance.

Typical Permit Requirements

A barrier mitigation project may require some or all of the following State, local, and federal permits, depending on the size and location of the project:

- Use and Protection of Waters Permit (Stream Disturbance, Excavation and Fill, Dam Safety)
- Dam Safety Permit
- Freshwater Wetlands Permit
- Local floodplain development permit
- Tidal Wetlands Permit
- Wild, Scenic and Recreational Rivers Program.
- Clean Water Act (CWA) Section 401 Water Quality Certification
- CWA Section 404 Permit and Rivers and Harbors Act Section 10 Permit, issued by the U.S. Army Corp of Engineers (USACE)

[Appendix 1](#) contains contact and additional information on possible regulatory requirements, e.g., the NYS Department of State Coastal Consistency Concurrence (when there is federal funding/approvals) and NYS Office of General Services to address State owned lands under water requirements. Also, pages 9-13 of the 2008 USFWS report [A Strategy for Removing or Mitigating Dams in New York State and Lessons Learned in the Upper Susquehanna Watershed](#)

lists these regulations with associated legislative and regulatory citations. A brief description of these are provided below:

USE AND PROTECTION OF WATERS – DEC: Requirements of 6 NYCRR Part 608 rules apply when there would be a physical disturbance to a stream or water body in New York State. Specifically, Part 608.2(a) is required whenever there is to be a change, modification or disturbance of any protected stream; the bed or bank of a protected stream in the State will be disturbed; or sand, gravel or other material is to be removed. Part 608.5 requires a permit for the excavation or placement of fill directly or indirectly in navigable waters. This includes marshes, estuaries, tidal marshes and wetlands that are adjacent to and contiguous at any point to any of the navigable water of the State, and that are inundated at mean high water level or tide. A permit for disturbance to bed or banks of a stream is needed when the classification and standard of stream is C(T) or Higher; these would include in-stream water bodies up to 10 acres and unclassified perennial streams, which take-on the classification of the stream to which it is tributary.

DAM SAFETY PERMITS – DEC: Dam Safety permits are issued under 6 NYCRR Part 608. Dam Safety permits are required to construct, reconstruct, repair, breach, or remove any dam or impoundment structure that is either between 6 and 15 feet high and impounds at least 3 million gallons, or is above 15 feet high and impounds at least 1 million gallons. These size thresholds are established under ECL 15-0503.

FRESHWATER WETLANDS PERMITS – DEC: Under the 6 NYCRR Part 663 rules, **DEC** regulates activities in freshwater wetlands that are 12.4 acres and larger, and in their regulated 100-foot wide adjacent areas. Many impounded water bodies are co-located with adjacent freshwater wetlands, and permits are required for temporary access or permanent installation of structures associated with a barrier mitigation, removal or construction project. NYSDEC regulates such activities to prevent, or minimize, impairment of wetland functions. Almost any activity which may alter or adversely impact the natural values of the wetlands or their adjacent areas are regulated. In addition, a freshwater Wetlands Permit pursuant to the Adirondack Park Agency (APA) Executive Law may be required from the APA for work on wetlands located within the Adirondack Park. The U.S. Army Corps of Engineers has jurisdiction over all size wetlands. A determination of whether a project site is located in or near a wetland would be made by the DEC Permit Administrator during the Pre-Application Conference. However, a preliminary assessment can be made by the landowner or technical assistance/service provider by using the [DEC online Environmental Mapper](#).

LOCAL FLOODPLAIN DEVELOPMENT PERMIT: Most New York State communities participate in FEMA's National Flood Insurance Program. In return for allowing federal flood insurance to be sold within the community, the community agrees to pass and enforce requirements within mapped Special Flood Hazard Areas to reduce future flood damages. Every development within a mapped Special Flood Hazard Area, which is an area that has a one percent or greater chance of flooding every year, requires a local floodplain development permit. Development is defined as any man-made change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, paving, excavation or drilling operations or storage of equipment or materials. Dam removal and associated work would fall within the

definition of "development." Upon reviewing the application, the local floodplain administrator must determine whether the proposed development may result in physical damage to any other property, including stream bank erosion and increased flood velocities. No permit may be issued if the development may result in physical damage to other properties. In addition, the requirements noted under the FEMA must be met.

TIDAL WETLANDS PERMITS – DEC: Under the 6 NYCRR Part 661 rules, DEC administers a permit program regulating activities in tidal wetlands and their adjacent areas. In general, tidal wetlands consist of all the salt marshes, non-vegetated as well as vegetated flats, and shorelines subject to tides including areas now or formerly connected to tidal waters. The adjacent areas extend up to 300 feet inland from the wetland boundary (up to 150 feet inland within New York City). NYSDEC requires a permit for almost any activity, which will alter wetlands or the adjacent areas. Tidal wetlands exist in counties of Suffolk, Nassau, Westchester, and Rockland, the City of New York, and Hudson River Estuary. A determination of whether a project site is located in or near a wetland would be made by the DEC Permit Administrator during the Pre-Application Conference.

WILD, SCENIC AND RECREATIONAL RIVERS: New York State designates a water body or river as part of its Wild, Scenic and Recreational River System by NYS law. The Act is administered by the Adirondack Park Agency (APA) in the Adirondack Park and the DEC for the rest of the state. A barrier mitigation project in these rivers would require a review of the impacts of any change to the land or uses in the channel and areas within ½ mile of the water body or river. The permit would address vegetation removal for access to the stream and any stream restoration structures. Footnote 4 of the USFWS Site Assessment Tool discussed in Step 1 of this guide can be used to determine which rivers fall under this designation.

CLEAN WATER ACT SECTION 401 WATER QUALITY CERTIFICATION – DEC: A Water Quality Certification (WQC) statement from the DEC certifies that the activity would comply with applicable provisions of the Clean Water Act and New York State water quality standards. A WQC is generally needed for any project involving federal approval, such as the 404 Nationwide Permits by the United States Army Corps of Engineers (USACE). Section 401 of the Federal Water Pollution Control Act requires that certain federal activities, including projects that require federal permits such as Section 404 Permits and **Federal Energy Regulatory Commission (FERC)** hydroelectric permits, must obtain a WQC.

CLEAN WATER ACT SECTION 404 PERMIT AND RIVERS AND HARBORS ACT SECTION 10 PERMIT – USACE: A barrier mitigation project would typically need these federal permits. The USACE regulates the placement of fill or dredged material and the construction of certain structures in waterways and wetlands, basically all waters of the United States. The Rivers and Harbors Section 10 Permit is required for any construction activity in and over any navigable water of the United States that may obstruct a navigable water and for the excavation or fill of navigable waters, and any other work affecting the course, condition, location or capacity of such waters. Additionally, a CWA Section 404 permit regulates the discharge of dredged or fill material into water of the United States, including navigable waters, streams, lakes and wetlands.

Visit site to plan next steps with key stakeholders and take site photos

After the Pre-Application Conference, the project applicant can expect more visits to the project site with local, state and federal agencies and local stakeholders who represent community and adjoining landowner interests. These visits would involve known regulatory stakeholders (e.g., DEC wetland biologist, the U.S. Army Corps of Engineers regulatory project manager and the NYSDOT Regional Hydraulic Engineer). Dialogue would focus on how the project would address specific environmental, safety and engineering structural issues of the dam or barrier, and how the project would affect infrastructure. These field visits would help refine plans and efforts to develop conceptual designs. Additional photographs of site would be taken.

Begin garnering community support

Open and clear communication is important to develop support for the project. Appropriate times to talk to potentially affected stakeholders and adjoining landowners and residents upstream and downstream would be planned. It is helpful to involve local land use officials, either directly or through the technical assistance/service provider or other partners. Inviting them to field visits can promote better understanding and buy-in of project scope. The project may be an opportunity to create some open space, fishing and recreational attributes in the community. There are benefits to considering a range of options and being open to ideas, especially in developing the feasibility study for final project design. If at all possible, find a local municipal official that is willing to champion your project as was discussed in [Step 1](#).

Plan for land ownership requirements prior to actual dam removal

A dam owner/project team must know current uses and legal rights associated with the dam and impoundment. It is important to be aware of land ownership around the dam structure and impoundment and any potential impacts to infrastructure (utilities, roads, bridges, sewer/water lines, etc.). There may be legal issues that the dam landowner would need to address as part of the project scope.

A typical legal issue concerns water rights in deeds of landowners along the impoundment behind the dam. You may need to determine who owns the land under the water, which is exposed after the dam is removed. If the dam removal would result in dewatering an upstream impoundment, shoreline property owners may be adversely affected, perhaps significantly.

Develop conceptual design and feasibility study

A feasibility study is developed to provide a concept-level plan with quantitative information on the environmental and engineering information to support a final decision for a preferred option. The scope of the study will depend on the size and nature of the project. [An example of tasks](#) for a feasibility study is provided below and on the next page. [NOAA](#) likes to see these tasks addressed in applications for its funding.

Generally, regulatory agencies would review the feasibility study to see that project alternatives have been considered to avoid, minimize or mitigate environmental impacts, including the no-action alternative. The study would normally address alternatives to removing the structure, protecting infrastructure, restoring in-stream and riparian habitat, and managing sediment. The site-specific information researched in Step One and Step Two of this guide would be incorporated into the study.

The dam owner's choice for the consulting team for conceptual and final engineering design of the project is critical. The members of the team would depend on the expertise needed given the scale, scope and complexities of the project. The dynamics of the riverine environment can warrant expertise from a multi-disciplines (e.g., engineering, environmental permitting, ecology and fluvial geomorphology). Any traditional engineering firms would be expected to consult with a firm with specific river restoration technical expertise or experience. Some technical assistance/service providers (TAPs), like county Soil and Water Conservation Districts and NGOs, may provide these services.

Ideally, the conceptual design would be available for review by all stakeholders, not merely the regulatory agencies. Local public works departments, transportation agencies and utilities should have the opportunity to review proposals for impacts to infrastructure early enough to prevent further development of obviously unsuitable proposals, and to assure that problems are addressed before they become last-minute bottlenecks or hasty revisions. In the long-run, the project applicant can save time and cost by making sure potential impacts would be addressed in the preferred alternative that is chosen for project design.

AN EXAMPLE OF TASKS FOR A FEASIBILITY STUDY

Task 1. Site Reconnaissance: Site visits, utility research, adjoining property deed search, meetings, obtain reference photos and other pertinent information.

Task 2. Access Route Survey, Project Site Survey, River Cross-Sections, Dam Survey, and Bathometric Survey: Coordinate terrestrial survey and perform bathometric survey for the dam, area surrounding each culvert/dam, access routes to each structure, affected structures, impoundments, evidence of utilities, wetlands, and edge of water. A deed plot of property lines to be utilized. All survey information will be assembled in cad format for use in the development of plans for dam deconstruction and protection of infrastructure.

Task 3. Base Plan Preparation: A base plan will be assembled showing existing information gathered in the survey scope item (Task 2) and reconnaissance scope item.

Task 4. Hydraulics and Hydrological Analysis: A model for the dam/culvert will be prepared that analyzes the downstream boundary condition, cross sections of impoundments, pre-dam conditions, post dam removal conditions, alternatives for partial removal, and site conditions under various flow scenarios. A hydraulic analysis with HEC-RAS or RMA-2 (this is probably more relevant here) will provide information on what is the minimum amount of dam that must be removed to create a stable environment that allows for targeted fish passage, identify stream

bank instability, and predict the impact dam removal will have on the frequency and severity of localized flooding.

Task 5. Sediment Accumulation Determination: The A/E shall conduct geophysical subbottom profiles using dual independent transducer based systems operating at 3-7 KHz and 28 KHz in selected areas of the backwater reservoir upstream of the Dam and downstream. Seismic profiles will be georeferenced using differential GPS. Seismic profiling will provide an independent measure of sediment accumulation and provide a spatial determination of sediment accumulation. The A/E shall also interpret subbottom profiles to provide a map of sediment accumulation within the current river shorelines in order to determine the volume of sediment storage within the current river shorelines.

Task 6. Soil Cores: The A/E shall identify nine (9) core locations (6 primary and 3 backup) using sediment accumulation map and subbottom profiles. The A/E shall collect six (6) cores using vibrocoring and push coring techniques. A maximum penetration of 4 meters will be achieved using these techniques. The A/E shall split, document, photograph and sub-sample collected cores. The A/E shall analyze the cores for physical properties (bulk, density, water content, grain size) based on strata changes within the cores with a minimum sampling of one sample per every two feet of collected core (estimated 30 samples). The A/E shall analyze the cores for priority pollutants using homogenized channel samples from top half and bottom half of collected cores (i.e. two samples from each core - total of 12 samples)

Semi-Volatile Organic Compounds (EPA 8270C/625)

Volatile Organic Compounds (EPA624/8260B)

Organochlorine Pesticides and PCBs (EPA 608/8081B)

Priority Pollutants Metals and Cyanide (EPA 200.8/6020A)

Step Three: Prepare Permit Application Package

Determine preferred alternative and obtain funding to implement and construct project

Based on the feasibility study and consultation with regulatory agencies and stakeholders, a preferred alternative is chosen for project implementation. The project's [final engineering and specifications](#) would be designed for this alternative.

The project manager would work with the dam owner (and TAPs) to obtain funding for project implementation. The information on [TAPs](#) and Appendix D of [A Strategy for Removing or Mitigating Dams in New York State and Lessons Learned in the Upper Susquehanna Watershed](#) may provide possible leads for funding elements of a dam removal and barrier mitigation project.

The cost estimate for the preferred alternative would include the costs of final design, permitting, construction and construction oversight. Before the engineering design is finalized, the cost estimate would be considered a “probable cost” based on the consulting team’s best judgment and past experience. In general, projected costs should not exceed reliable and available funding.

Applications to funding sources for grants, loans and other funding may cover part(s) of or the entire scope of the project. Letters of support could be gathered and included with these application packages. Grant awards and funding for the project would need to be in place before progress on construction of the project could continue.

Funding may have been awarded for aspects of project planning and development conducted in [Step 1](#) and [Step 2](#). These products (findings, studies, assessments) would be used to complete the feasibility study. Additional funding sources may be sought for the construction phase of the project. The dam owner may apply for available grants from Federal and State agencies and foundations. Federal grants for project construction would typically require final engineering design plans and permits in hand before grant moneys would be awarded. The final engineering design would include the engineer's cost estimate and break down of construction costs.

Prepare final engineering design and complete project specifications

The consulting/engineering team would prepare final engineering design for the preferred alternative. The design and construction of projects for dams that are above permit thresholds must be supervised by a professional engineer (P.E.) registered in NYS. Projects for dams that are below thresholds should still have a P.E. involved. Permit applications should include an engineering report, plans and specifications for the proposed work. The level of detail in the application should be directly proportional to the size of the dam and impoundment and the dam's hazard class. The proposed design must address the following concepts:

- Dam breaching and/or removal work must be performed in a safe manner. Ponds and impoundments must be drained and inflows must be properly diverted around the work area. "Wet breaching" is not considered to be good practice.
- Any portion of the dam to remain in place must be stable. The side slopes of a breach through an embankment dam should be adequately sloped (minimum 1.5H:1V), and the normal flow channel should be adequately armored. Upper portions of the cut slope should, at a minimum, be stabilized with appropriate seed and mulch. The sides of breaches through concrete and laid-up stone dams should have sufficient structural stability to resist anticipated flows.
- For a dam to be considered decommissioned (i.e. assigned a hazard class of Class D – Negligible or No Hazard), the dam must either be fully removed, or the partial breach must be sized to pass the 100-year event while resulting in no more than a one foot increase in water surface elevation upstream of the dam. Dams with partial breaches that result in a backwater greater than 1 foot during the 100-year event may still be considered to be a dam, although the hazard class may be lowered. . To obtain an estimate of the 100-year flood event, use the [USGS StreamStats tool](#).
- Upstream and downstream impacts of the breach/removal must be considered. Such projects typically result in a steeper channel slope, which increases flow velocities and erosive energy. Upstream and downstream features, such as culverts and bridge foundations, may be susceptible to scour and erosion resulting from the increased velocities.
- Dam breaching and removals will often involve elements of sediment removal and/or stabilization, and the restoration of the stream channel to a stable condition. Following

the initial breaching/removal work, the stream reach should be monitored for at least one complete cycle of seasons. It may be necessary to return to the stream reach to conduct repairs to facilitate the reestablishment of the equilibrium of the stream channel.

- In some cases it may be advantageous to leave a short sill across the breach area to help retain/control the release of accumulated sediments. In such cases it may be appropriate to place a rock ramp on the downstream side of the sill to facilitate fish passage.
- Care should be taken to retain/restore the connection between the stream channel and the flood plain. Incised channels become disconnected from the floodplain, and may exacerbate flooding issues.
- Use [Natural Channel Design methods](#) to the extent possible for stream channel restoration after dam removal or barrier mitigation. Your [local SWCD](#) may be able to provide assistance with natural channel design options and implementation. [USGS Regional Curves](#) are available to help in estimating channel geometry.

The engineer and/or project team would address any staging of sediment management, equipment access to the dam site, removal of debris and concrete, and timing of dam removal to minimize impacts to fish, wildlife and existing wetlands and habitats along the stream corridor in the specifications for project implementation.

Based on early initial contacts with bridge owners, a full hydraulic analysis may be required to either demonstrate that the removal will have no adverse effects on the bridge(s), or to design appropriate protective countermeasures. It should also be noted that installation of any protective measures at a bridge site or roadway embankment will require a Highway Work Permit from NYSDOT, or an equivalent permit from a County or local owner.

Prepare applications for required permits and regulatory approvals

Based on the aforementioned planning, research and design of the project, the project applicant would have a comprehensive set of findings for implementation of the preferred project alternative. The project team would know the [regulatory jurisdictions](#) for the project and obtain permits and approvals before construction could begin. Instructions with the [Joint Application Form](#) would be followed to determine what information to include in the permit application package. The applicant or project manager would work with project team members to complete application forms for these permits and approvals. Particular members of the team, e.g., a TAP or project engineer, may play specific roles in preparing these applications. When complete, the application package would be sent to DEC and each agency with regulatory jurisdiction over construction of the project and checked in the Joint Application Form. The package would likely include the feasibility study, final engineering design for the preferred alternative, and plan specifications for construction site activities in and along the river and its corridor.

Step Four: File All Required Permit Applications and Comply with Permit Review and Issuance Procedures

Step 4 is the formal filing of applications for permits and approvals. After the *Joint Permit Application* is filed with the DEC, time frames for [UPA](#) go into effect. If the DEC determines the application to be “incomplete,” the applicant will be notified with instruction on what

additional information must be submitted to address SEQRA and to “complete” the permit application. The project applicant is likely to be required to obtain permits or approvals from other agencies (e.g., USACE, OPRHP, possibly others) before project construction can begin.

Typically, a dam removal or barrier mitigation project would be defined as a “major” project under DEC UPA procedures. For major projects that require no public hearing, DEC must make a final decision within 90 days of the “completeness” of the permit application (called the “completeness determination”).

A dam owner may choose to hold a public information meeting to explain plans to residents that would be affected and to inform the public-at-large. These meetings can draw support for the project and identify measures that would mitigate any adverse impacts of the project. These would be held before any required public hearing.

For major projects that require a public hearing, DEC notifies the applicant of the public hearing within 60 days of the “completeness” determination. Once the hearing ends, DEC must issue a final decision on the application within 60 days after receiving the final hearing record.

Before the DEC issues a final decision on the application, the applicant may be asked for additional information to address public and regulatory agency comments. Permit conditions may be added to the scope and design of the project to address these concerns before permits are issued.

Step Five: Implement Project and Consider Any Post-Removal/Mitigation Measures

Once all necessary permits and approvals are obtained, the project can proceed. The site would be prepared according to the engineering design plan and specifications. The project would be staged to remove or relocate any public infrastructure (utilities, roads, etc.) and to control erosion and sedimentation. Care would be taken to reduce water levels in the impoundment behind the dam and prevent a release of sediment from the impoundment into the waterway. Measures would be put in place to protect water quality and restore habitat along the riparian corridor and allow the return of a natural flowing of river. The project construction contractor(s) would hold performance bonds to insure that the project would be completed according to the engineering design plan and specifications.

References

Dam Removal Information and Internet Sites⁵

1. *Dam Removal Toolkit* by American Rivers - go to web page address: http://www.americanrivers.org/site/PageServer?pagename=AMR_content_f6e3
2. General information on New York Rivers United home web page – go to web page address: <http://www.newyorkriversunited.org/>

⁵ Note: out-of- New York State references are only guidelines. Other NYS specific requirements may apply.

3. Clearinghouse for Dam Removal Information – go to web page address:
<http://www.lib.berkeley.edu/WRCA/damremoval/index.html>
4. Video by National Oceanic and Atmospheric Administration (NOAA) “Relics and Rivers – Dismantling Dams in New England” – to view and play DVD go to web page address:
<http://www.nmfs.noaa.gov/habitat/restoration/publications/dvd.htm>
5. Commonwealth of Massachusetts Riverways Program web page address:
<http://www.mass.gov/dfwele/der/index.htm>
6. Collins, M., K. Lucey, B. Lambert, J. Kachmar, J. Turek, E. Hutchins, T. Purinton, and D. Neils. 2007. Stream Barrier Removal Monitoring Guide, Gulf of Maine Council on the Marine Environment. www.gulfomaine.org/streambarrierremoval
7. *Dam Revmoval in Massachusetts, A Basic Guide for Project Proponents*, The Commonwealth of Massachusetts, Executive office of Energy and Environemtnatl Affairs, December 2007, for information contact , Riverways Program (617)626-1540.
www.mass.gov/dfwele/river/index.htm
8. *Dam Removal and the Wetland Regulations*, Massachusetts Department of Environmental Protection Fureau of Resource Protection, Boston MA 02108, December 2007, Riverways Program (617)626-1540. www.mass.gov/dfwele/river/index.htm
9. National Oceanic and Atmospheric Administration (NOAA) Restoration Portal:
<http://habitat.noaa.gov/restoration>
10. *Dam Removal: Creating a Monitoring Guide for Removing Barriers in the Gulf of Maine*, NOAA Coastal Services Center article, July/August 2008; webpage:
<http://www.csc.noaa.gov/magazine/2008/04/article2.html>
11. Film of interest “Rivers of a Lost Coast” at <http://www.riversofalostcoast>, which looks a decline of many well-known fisheries; the rise and fall of California salmon and steelhead rivers through the eyes of famous anglers who fished there.

Stream Management Guides and Internet Sites⁶

1. *Stream Processes – A Guide to Living in Harmony with Streams* by Chemung County Soil and Water Conservation and others, and authored by Janet Thigpen, Southern Tier Central Regional Planning and Development Board, August 2006 - to view or download, go to the bottom of the Chemung County SWCD home web page - <http://www.chemungcountyswcd.com/Tire%20Page.htm> - and click on “Stream Guide” or “Stream PowerPoint”; or call 607-739-2009 to obtain a hard copy of the Guide.
2. *Stream Corridor Inventory and Assessment Techniques, A guide to site, project and landscape approaches suitable for local conservation programs*. USDA Watershed Science Institute Technical Report, January 2001, revised ~
http://www.wsi.nrcs.usda.gov/products/W2Q/strm_rst/docs/Stream_Corridor_Inventory_Techniques.pdf
3. *A Handbook for Stream Enhancement & Stewardship* by The Iazzk Walton League of America, 2006 – go to www.iwla.org/sos or call 1-800-284-4952
4. *Stream Corridor Restoration – Principles, Processes, and Practices* by the Federal Interagency Stream Restoration Working Group, October, 1998, Revised August, 2001 (United State Department of Agriculture Natural Resource Conservation Service – USDA NRCS - NEH-653) – to view or download go to web page address:
http://www.nrcs.usda.gov/technical/stream_restoration/newtofc.htm

⁶ Note: out-of- New York State references are only guidelines. Other NYS specific requirements may apply.

5. *USDA NRCS Stream Restoration Design* (Title 210-VI Engineering/National Engineering Handbook (NEH), Part 654) is a 2007 technical follow-up to NEH-653 (Item 3 above). NEH-654 complements NEH 653 by providing assessment and design tools that are applicable to any stream restoration work, whether it primarily follows a natural stream restoration or is strictly a structural project. To view or download, go to web page address: <http://policy.nrcs.usda.gov/index.aspx>
6. *Guidelines for Natural Stream Channel Design for Pennsylvania Waterways* developed by the Keystone Stream Team, March 2003 – go to web page address: http://www.keystonestreamteam.org/kst_documents.htm

Appendix 1 – Contact Information for DEC and Other Agencies with Possible Regulatory Jurisdictions

DEC Regional Offices

(Contact the Regional Permit Administrator, Division of Environmental Permits)

Region 1 Nassau and Suffolk counties -
Phone: 631-444-0204

Region 2 Bronx, Kings, New York, Queens
and Richmond counties – Phone: 718-482-
4900

Region 3 Dutchess, Orange, Putnam,
Rockland, Sullivan, Ulster and Westchester
counties – Phone: 845-256-3000

Region 4 Albany, Columbia, Delaware,
Greene, Montgomery, Otsego, Rensselaer,
Schenectady and Schoharie counties – Phone: 518-357-2234

Region 5 Clinton, Essex, Franklin, Fulton, Hamilton, Saratoga, Warren and Washington counties
– Phone: 518-897-1200

Region 6 Herkimer, Jefferson, Lewis, Oneida and St. Lawrence counties – Phone: 315-785-2239

Region 7 Broome, Cayuga, Chenango, Cortland, Madison, Onondaga, Oswego, Tioga and
Tompkins counties – Phone: 315- 426-7400

Region 8 Chemung, Genesee, Livingston, Monroe, Ontario, Orleans, Schuyler, Seneca, Steuben,
Wayne and Yates counties – Phone: 585-226-2466

Region 9 Allegany, Cattaraugus, Chautauqua, Erie, Niagara and Wyoming counties – Phone:
716-851-7000



Other State, Federal or Local Agencies

Depending on the scope, scale, location and preferred alternative for your dam removal or barrier mitigation project in New York State, other regulatory thresholds may apply. These are normally discussed during the [Pre-Application Conference with your DEC Regional Permit Administrator](#). However, the dam/barrier mitigation project manager should be acquainted with the list below and identify any of the jurisdictions (that apply to the project) when meeting with the DEC Regional Permit staff. This would help assure the coordinated review of all involved agencies. Ultimately, the project applicant is responsible for submitting applications for any permits and approvals. The form in [Appendix 2](#) is used to request a Pre-Application Conference with the DEC Regional Permit Administrator.

United States Army Corps of Engineers (USACE)

The US Army Corps of Engineers (USACE) regulates dredging, the discharge of dredged or fill material, and the construction of certain structures in waterways and wetlands. Therefore, when you propose activities in or adjacent to any waterways or wetlands, the USACE has jurisdiction. An applicant would submit the “Joint Application Form” to engage all involved agencies, such as, USACE, DEC, DOS, and the OGS. Since the DEC and USACE have different application requirements, the USACE may contact you for additional information to fulfill their requirements. Be sure to initiate contact with USACE directly, if you have not heard back from them within 30 days after submitting your Permit Application Form.

Be Aware: Being told that DEC will not require a permit for your project does not necessarily mean USACE will not require one. You must contact USACE to find out. Likewise, obtaining a DEC permit does not relieve you from complying with Federal law and with the regulations implemented by the USACE. While the joint application should automatically alert USACE to your project and initiate the Federal permit application process, ultimately, **you** bear the responsibility to inform them and ensure compliance.

USACE DISTRICTS JURISDICTION BY DEC REGION

There are three [USACE Districts](#) in New York State: the Buffalo, New York and Philadelphia Districts. However, projects located in the small Philadelphia USACE District portion of NYS, affecting the Delaware River Basin, are administratively handled by the New York USACE District Office.

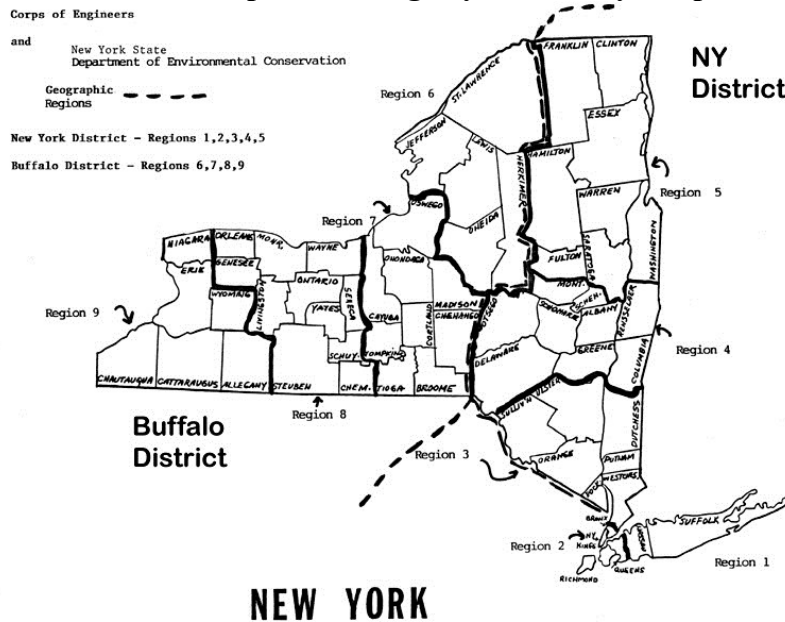
For projects proposed in *DEC Regions 1, 2 and 3*, obtain more information concerning USACE permits from the [New York District USACE](#), Attn. Regulatory Branch, 26 Federal Plaza, New York, NY 10278-0090; Email: www.nan.usace.army.mil:

- ❑ NYSDEC Regions 1, 2 and Westchester/Rockland County Phone: 917-790-8511
- ❑ NYSDEC Region 3, except Westchester/Rockland County Phone: 917-790-8411

For projects proposed in *DEC Regions 4 and 5*, contact the NY District Upstate Regulatory Field Office (URFO), Department of Army Attn: CENAN-OP-R, USArmy Engineer District-New York, URFO, 1 Buffington Street, Watervliet, NY 12189-4000; Phone – 518-266-6350, -6360; Fax – 518-266-6366; Email: cenan.rfo@usace.army.mil

For projects proposed in *DEC Regions 6 through 9*, obtain more information concerning USACE permits from the [Buffalo District USACE](#), Attn. Regulatory Branch, 1776 Niagara Street, Buffalo, NY 14207-3199; Phone – 716-879-4330; Email: www.lrb.usace.army.mil.

New York State Map of Coverage by U.S. Army Corps of Engineers Offices



New York State Department of State (DOS)

Project applicants should understand there are 2 forms of coastal consistency determinations: one is through a Federal process and the other through New York State. The requirements and geographic scope of the coastal area for these are different.

When there is any federal jurisdiction, the permit applicant provides a complete Coastal Consistency Certification with the permit application directly to the involved federal agency, e.g. USACE. A Federal activity (which includes approval and funding) can be large or small and either “major” or “minor” under [SEQRA](#); the activity is not necessarily a physical action – it is *anything* undertaken directly by a Federal agency, requiring any form of authorization from a Federal agency, or involving financial assistance from a Federal agency. Such activity would be subject to Federal Coastal Consistency Certification requirements if it is located within the coastal areas or is outside the area but would have any reasonable foreseeable direct or indirect effect (effects test) on any coastal resource or use.

If a Coastal Consistency Certification is needed, you will be informed of this by the Federal agency involved in your project, usually USACE. Federal regulation 15 CFR Part 930 requires Federal agencies to inform applicants of these and related requirements, whether the proposal is or is not consistent with State coastal policy and the Department of State either concurs with or objects to the applicant’s consistency application. If DOS objects, Federal consistency provisions expressly prohibit issuance of the authorization by the Federal agency, unless the result of the DOS objection is overridden through a specific Federal appeals process. Federal regulation 15 CFR Part 930 explains this process.

For the Federal Consistency Assessment Form, go to the following USACE web pages: for [NY District](#), click on *Forms and Documents* and *Instructions for NYS Permit Applications*; or for the [Buffalo District](#), click on *Application Forms for New York*.

In contrast to Federal Coastal Consistency Certification, the State Coastal Zone Consistency Concurrence provisions are procedural, and State agencies must comply with the substantive requirements. Applicants are NOT required to complete a Coastal Assessment Form (CAF) or certify to anything. State agencies complete the CAF and make consistency determinations and certifications in a process distinctly separate from Federal Coastal Consistency process.

If a Federal approval is not required, DEC will complete the Coastal Zone Consistency Concurrence as part of the DEC permit decision. Subject coastal areas in New York State include the Atlantic Ocean, Long Island Sound, Arthur Kill, Kill van Kull, Harlem River, East River, Hudson River south of the Federal dam in Troy, Niagara River, St. Lawrence River, Lake Ontario, Lake Erie, and all connecting water bodies including tributaries to Lake Ontario and Lake Erie, bays, harbors, shallows, and marshes.

State consistency assessments apply to some designated inland waterways in New York where local waterfront revitalization programs have been developed. Go to the [DOS website](#) and click on *consistency* review for a list of all approved LWRPs in New York State and a map identifying the coastal zone and their other special management areas. This information can help the applicant determine if coastal issues need to be addressed in the [Joint Permit Application](#).

New York State Office of General Services (OGS)

In most instances, the State of New York owns the land beneath coastal waters, and waters of large lakes and rivers. The New York State Office of General Services (OGS) manages most underwater holdings. The applicant must determine whether the project involves any New York State-owned underwater lands and obtain necessary approvals or easements from OGS. The applicant would formally notify OGS by sending it a copy of the [Joint Application Form](#) package for the project. DEC will not notify OGS if state-owned underwater lands appear to be involved. For questions on jurisdiction, contact: [OGS](#), Division of Land Utilization, Bureau of Land Management, Corning Tower, Empire State Plaza, Albany, NY 12242; Phone – 518-474-2195.

New York State Office of Parks, Recreation & Historic Preservation (OPRHP)

A dam removal or barrier mitigation project, causing ground disturbance or physical changes to structures (including impoundments), may have significant impacts on historical or archaeological sites. As discussed in [Step 2 of this guide](#), if structures present on your project site are over 50 years in age, or there is likelihood that archeological resources may be present, a cultural resource survey including a field study of archaeological or historic features may be needed before you can actually undertake any barrier removal activities. Therefore, the need for an archeological or historical study may need to be evaluated as early as possible in the planning process to avoid project delays.

Normally, these impacts would be evaluated through the [SEQR review process](#) and by Federal agencies subject to Section 106 of the National Historic Preservation Act (NHPA), working through [State Historic Preservation Office \(SHPO\)](#) at the NYS Office of Parks, Recreation and Historic Preservation (OPRHP). The Field Services Bureau of the OPRHP (alias the SHPO) protects New York’s historic cultural resources from the potential impacts of projects that are funded, licensed or approved by state or federal agencies. Under Section 106 of the NHPA and Section 14.09 of the New York State Historic Preservation Act, its role in the review process is to ensure that effects or impacts on eligible or listed properties are considered and avoided or mitigated during the project planning process. In addition, the SHPO advises local communities on local preservation environmental reviews, upon request, under the provisions of the SEQRA.

A SHPO project review can involve all or part of the following review process, as discussed on its [web site](#). The program review involves all SHPO program areas and is conducted in two stages. First, the National Register Unit assesses a property to determine whether or not it is listed in the New York State or National Registers of Historic Places. If it is not in a register, it is evaluated to determine whether or not it meets the criteria to be included in the registers. If listed or determined eligible for listing, then the second stage of the review is undertaken. Then, the Technical Services Unit staff would determine whether or not the proposed action/project would have an impact/effect on the qualities of the property, making it eligible for a register. For projects that involve new construction or the significant expansion of existing buildings, the project will also be reviewed by Archeology Unit staff to determine whether or not the project site falls within a known area of archeological sensitivity. If the site is in such area, staff would request phased surveys to determine the extent of the potential impact.

If a project involves a Federal agency (for permits or funding), Section 106 of the NHPA requires the Federal agency to coordinate with the SHPO. Many dam removal or barrier mitigation projects would be subject to Section 106 because they require a federal permit from at least the U.S. Army Corps of Engineers (**USACE**). A very good discussion of the federal review process for dam removal projects is found in the guide: [Dam Removal and Historic Preservation – Reconciling Dual Objectives](#).

When DEC is involved in approving a dam removal or barrier mitigation, it would consult with the SHPO at the OPRHP. A Federal Section 106 review would usually serve as the state review as well, as long as the same project areas are being considered by State and Federal agencies. In the rare case that the DEC has no permit jurisdiction and is not involved in the dam barrier mitigation project, the DEC would not coordinate with SHPO through SEQR on an applicant’s behalf. In such cases, the lead agency for the SEQR review would need to contact the SHPO for consultation and guidance. The project applicant may consult the [OPRHP web site](#) for forms and guidance. Any application packet to OPRHP would likely include a Project Review Submission Cover Form and Building/Structure Inventory Form.

Contact: New York State Historic Preservation Office, Peebles Island Resource Center, P.O. Box 189, Waterford, NY 12188-0189; Phone- 518-237-8643

Adirondack Park Agency

If the project you are planning is located within the boundaries of the Adirondack Park, a permit may be required from the Adirondack Park Agency (APA) for a Freshwater Wetlands Permit, or for approval of a new land use and development or subdivision, or for a variance from the shoreline standards of the Agency. APA is no longer listed on the [Joint Application Form](#). The applicant would apply for [APA](#) permit directly. Contact: APA, P.O. Box 99, Ray Brook, NY 12977; Phone – 518-891-4050.

Lake George Park Commission

If the project you are planning is located within the Lake George Park, a permit may also be required from the Lake George Park Commission (LGPC) for docks, wharves and moorings; excavation/fill below the mean high water level; or storm water management. The LGPC is no longer listed on the [Joint Application Form](#). This would require a separate permit application to the LGPC. Contact: [Lake George Park Commission](#), PO Box 749, Fort George Road, Lake George, NY 12845-0749; Phone – 518-668-9347.

New York Power Authority (NYPA)

The New York Power Authority regulates shore development along the St. Lawrence River and its tributaries in the St. Lawrence County towns of Massena, Lisbon, Louisville, and Waddington. Contact: [NYPA](#), PO Box 700, Massena, NY 13662; Phone – 315-764-0226.

Local Governments

Finally, county, city, town or village building permits, flood plain permits, or other approvals may be necessary. You should check with the appropriate offices, including local communities administering National Flood Insurance Program (NFIP) and [Federal Emergency Management Agency \(FEMA\)](#) floodplain mapping.

Any change to a stream that has been mapped by FEMA will require at the least a floodplain development permit from the local community. If the project involves state land or state funds, it will have to comply with Part 502 of DEC regulations. Finally, if the dam removal changes either the base flood elevations or the boundaries of the special flood hazard area, the applicant will have to apply to FEMA for a Letter of Map Revision.

The DEC Floodplain Management Section (Phone: 518-402-8151) assists local communities in carrying out NFIP/FEMA responsibilities. You must inform NYSDEC of any other local approvals needed for your project. This will enable a coordinated review among all involved agencies.

Federal Energy Regulatory Commission (FERC)

The removal or alteration of a federally regulated structure involves additional regulatory processes when it involves a hydropower dam licensed by the FERC. A description of these processes is beyond the scope of this document. For more information, contact Ann F. Miles, [FERC](#), Division Director for Hydropower; Phone: 202-502-6769; Email: ann.miles@ferc.gov and DEC Division of Environmental Permits (Phone: 518-402-9172).

NYS Canal Corporation

In the event land under or contiguous to a barrier (bridge, culvert, dam) is owned by NYS Canal Corporation or the barrier would affect a NYS Canal Corporation barrier up or down stream of the proposed barrier mitigation project, contact: Howard M. Goebel, P.E., P.H., Canal Hydrologist at the [New York State Canal Corporation](#), 200 Southern Blvd, Albany, NY 12201; Phone – 518-471-5888.

NYS Department of Transportation (DOT)

In the event that land under or contiguous to a barrier (bridge, culvert or dam) is owned by NYSDOT, or that proposed work on the barrier would affect a NYSDOT structure upstream or downstream of the proposed barrier mitigation project, the appropriate [NYSDOT Regional Office](#) should be contacted. The Regional Hydraulic Engineer should be the principal contact. If any work is to be performed within the NYSDOT right-of-way, the appropriate permits can also be obtained through the Regional Office. Technical assistance may also be available from the Regional Hydraulic Engineer or from the NYSDOT Main Office Hydraulic Design unit; Phone – 518-457-9215.

Appendix 2: NYS DEC Barrier Mitigation Pre-Application Conference Form

Name of Applicant (Print Full Name)		Telephone Number (Daytime)	
Mailing Address			
Post Office		State	Zip Code
Taxpayer ID (if applicant is not an individual)			
Applicant is a/an: (check as many as apply) <input type="checkbox"/> Owner <input type="checkbox"/> Operator <input type="checkbox"/> Lessee <input type="checkbox"/> Municipality / Governmental Agency			
If applicant is not the owner, identify owner here - otherwise, you may provide Agent/Contact Person Information.			
Owner or Agent/Contact Person <input type="checkbox"/> Owner <input type="checkbox"/> Agent/Contact Person		Telephone Number (Daytime)	
Mailing Address			
Post Office		State	Zip Code
PROJECT / FACILITY LOCATION (mark location on map*) Location: (including Street or Road) County: Town/City/Village:			
Name of Stream, Waterbody or Wetlands on the property			
Project Description and Purpose: (Category of Activity is barrier mitigation; Cite <u>Type</u> of Structure or Activity, e.g., performance alteration, partial removal, or complete removal, and add brief narrative of proposal including any known issues to mitigate (sediment in upstream impoundment, historic structures on federal/State register, etc.) Submit plan**			
*Site Location Map Mandatory: Provide a location map showing the precise location of the project. A portion of a USGS topographical map is preferred, however, a town or county highway map or other suitable map (such as from the Internet) will suffice providing that the specific site location can be determined. Tax maps are not acceptable.			
**Project Plan: If available, provide a preliminary project plan that shows the existing conditions as well as the proposed work. If known, plot any DEC or federal regulated wetlands (go to DEC Environmental Mapper, which is an online mapping resource at http://www.dec.ny.gov/animals/38801.html) and speak to DEC or USACE wetlands biologist to validate.			
Agenda: Provide draft meeting agenda of items to be discussed with the Department. Include the SEQR status if possible and local approvals needed. Explain objective of meeting and number of attendees.			

List of Acronyms

6NYCRR – New York Codes, Rules and Regulations for the DEC

DEC – New York State Department of Environmental Conservation

DOS – New York State Department of State

DOT – New York State Department of Transportation

EAP – [An Emergency Action Plan pursuant to 6NYCRR Part 673](#) is required for owners of Class C-High Hazard and Class B-Intermediate Hazard dams.

ECL – Environmental Conservation Law

EQIP – The NRCS Environmental Quality Incentives Program

FEMA - Federal Emergency Management Agency

NFIP - National Flood Insurance Program

NGO – Non-governmental organizations are not-for-profit entities with public interest in environmental matters. In this guide, these regard possible barrier mitigation projects.

NHPA - National Historic Preservation Act

NRCS – Natural Resources Conservation Services department of the USDA (see below)

NYTA/CC – New York Thruway Authority/Canal Corporation

NYPA - New York Power Authority

NYS – New York State

NYSDEC – see DEC

OPRHP – New York State Office of Parks, Recreation and Historic Preservation

OGS – New York State Office of General Services

SEQRA – [State Environmental Quality Review Act](#) requires site specific review and mitigation of environmental impacts associated with a project.

SHPA – The State Historic Preservation Office in NYS is located in OPRHP.

SWCD – [Soil and Water Conservation District](#) - There is a SWCD in each county of the State, and the 5 Burroughs in the greater New York City area. See Map for listing near you.

TAPs - [Technical assistance or service providers](#) (TAPs) See list in guide of local, state and federal agencies and NGOs, which provide technical assistance or services.

TNC – The Nature Conservancy

USACE – United States Army Corps of Engineers

USDA – United States Department of Agriculture

USEPA –United States Environmental Protection Agency

USFWS - United States Fish and Wildlife Service

USGS – United States Geological Survey

WHIP - The [NRCS Wildlife Habitat Incentives Program](#)

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