Earthen Embankment Integrity Program

SEQR Final Generic Environmental Impact Statement

November 2022

Prepared for:

New York State Canal Corporation
30 South Pearl Street
Albany, New York 12207-2058
(518) 449-6000

Prepared by:

Bergmann

and

New York Power Authority

Date of Issuance: _____

Contact Person: James Candiloro, P.E., Director, Environment, Health & Safety, New York State Canal Corporation, 30 South Pearl Street, Albany, New York 12207-2058 (518) 433-6841

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1 SEQR AND DESCRIPTION OF THE PROPOSED ACTION

1.1 Project Background

The New York State (NYS) Canal System encompasses the modernized navigable inland waterways and additional properties under the jurisdiction of the New York State Canal Corporation (NYSCC) ~~that traverse Upstate New York~~. The modernized portion of the NYS Canal System is a navigable 524-mile inland waterway that traverses ~~Upstate~~ New York east to west along the Mohawk and Oswego River Basins, the Niagara Escarpment, and the Tonawanda Creek basin, and north to south between Waterford, NY and Whitehall, NY. The waterway connects the Hudson River with Lake Champlain, Lake Ontario, Cayuga Lake, Seneca Lake and Lake Erie via the Niagara River. The modernized NYS Canal System includes four canals: the Erie, Champlain, Oswego and Cayuga-Seneca; canalized natural waterways, including five lakes: Oneida, Onondaga, Cross, Cayuga and Seneca; short canal sections at Ithaca and Watkins Glen; and canal terminals on Lake Champlain.

In addition to the modernized portion, NYSCC retains jurisdiction over ~~has retained~~ numerous systems of remnant canals, feeders, and reservoirs that were formerly developed as components of various canal systems in New York State that are decommissioned and no longer used for canal navigational purposes. The systems include what are commonly referred to as the northern and southern (east and west) reservoirs, the Old Champlain Canal, and some remnant portions of the Old Erie Canal. The northern reservoir system features ~~owned by~~ under the jurisdiction of the NYSCC, and either still in operation or decommissioned, include: Woodhull Reservoir, North Lake Reservoir, South Lake Reservoir, Forestport Feeder, Black River Canal and the Nine Mile Feeder. The southern (east) reservoir system features ~~owned by~~ under the jurisdiction of the NYSCC, and either still in operation or decommissioned, include: Kingsley Brook Feeder, Kingsley Brook Reservoir, Bradley Brook Feeder, Bradley Brook Reservoir, Hatch Lake Reservoir, Eaton Brook Reservoir, Chenango Feeder, Madison Feeder, Madison Reservoir, Madison Feeder, Leland Pond Reservoir and Leland Pond Outlet, and Chenango Canal. The southern (west) reservoir system features ~~owned by~~ under the jurisdiction of the NYSCC, and either still in operation or decommissioned, include: Erieville Reservoir, Cazenovia Feeder, Chittenango Feeder, DeRuyter Reservoir, Limestone Feeder, Jamesville Reservoir, Butternut Feeder, and the Old Erie Canal. The Glens Falls Feeder and Old Champlain Canal are located in eastern New York ~~State~~ and are associated with the historic Champlain Canal. ~~Within these systems and portions of the Old Erie Canal remnants described above, only the former canal and feeder segments that remain under the NYSCC's jurisdiction will be addressed.~~ Reservoirs under the jurisdiction of NYSCC are inspected, evaluated, and maintained consistent with 6 NYSCRR Part 673 regulations. The modernized NYS Canal System and numerous systems of remnant canals and feeders comprise the project area (see **Figure *1.1-1***). This excludes NYSCC reservoirs that are inspected, evaluated, and maintained consistent with 6 NYSCRR Part 673 regulations.

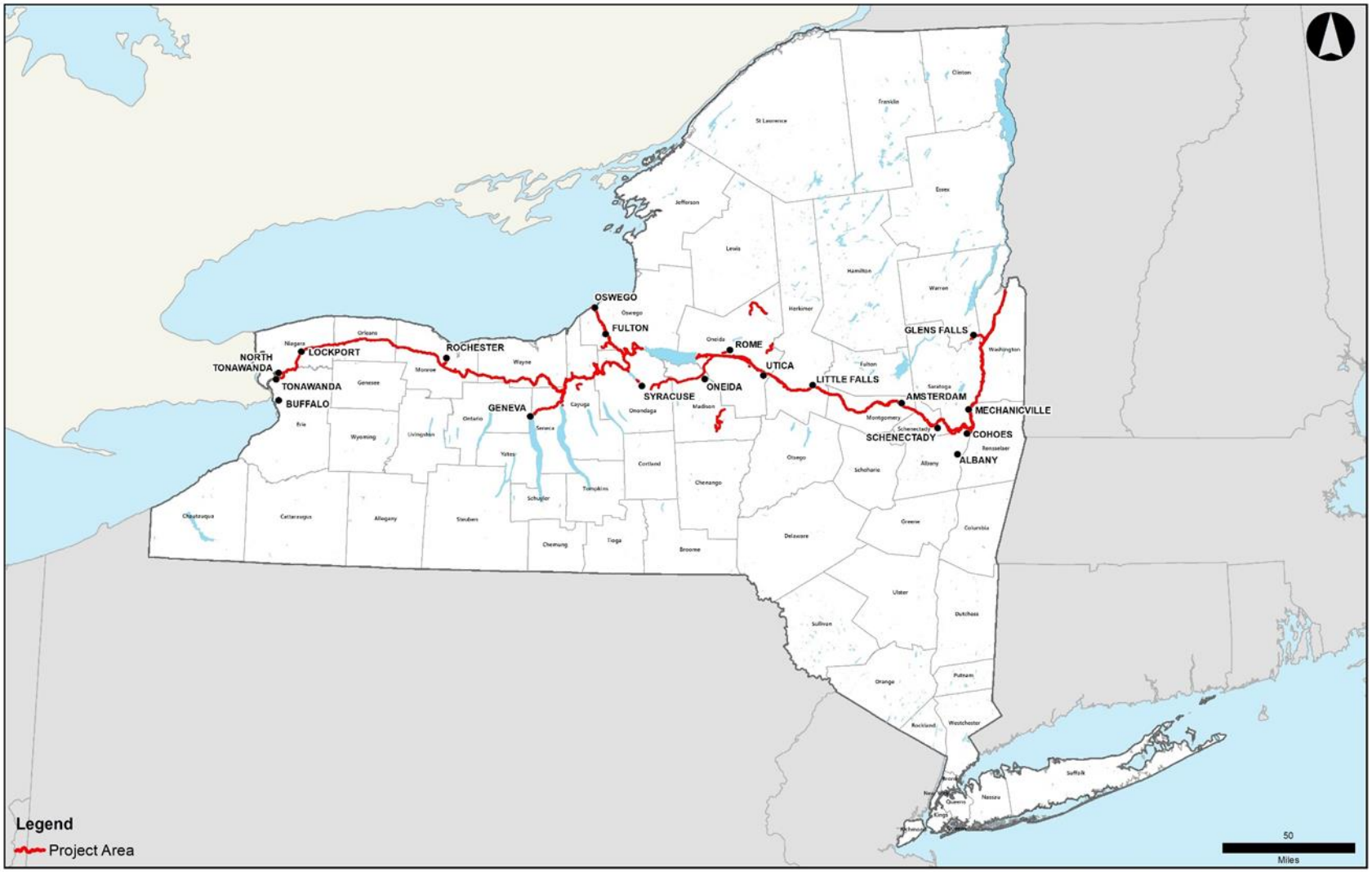


Figure 1.1-1: Project Area Map

Key components of the NYS Canal System are earthen embankments (embankments) that impound water to form navigable waterways or feeders. Proper maintenance of the embankments is imperative to maintain integrity of the structures: for ~~minimizing~~ mitigating risks of embankment failures to health and safety of people that live, work or recreate along the NYS Canal System; for ~~minimizing~~ mitigating the risks of damage to property and the environment; and for maintaining the integrity and operability of the NYS Canal System in a cost-effective manner. Proper maintenance of the embankments will ~~prevent~~ limit interruptions of the usage of the NYS Canal System by boaters and towpath users.

Parts of the embankments have become overgrown with trees, brush, and ~~unwanted~~ other scrub vegetation, are subject to animal burrowing, and are experiencing erosion, seepage, or settlement. Concrete and masonry surfaces that follow the embankment lines and grades also suffer from various types of deterioration. These conditions could compromise the integrity of the embankments and hinder safety inspections, and~~, which impede the safe operation of the NYS Canal System and can cause embankment failures. Together they~~ represent significant public safety, environmental and economic risks that must be mitigated ~~must be properly managed~~.

To address this pressing need, the NYSCC will implement a comprehensive, system-wide embankment maintenance program (hereafter referred to as the Earthen Embankment Integrity Program, or EEIP) to restore, maintain and manage the integrity of embankments within the NYS Canal system, and has developed the *NYSCC Embankment Inspection & Maintenance Guide Book (Guide Book)* to carry out the program. The *Guide Book* provides a system-wide approach to embankment inspections, evaluations, prioritization, and maintenance practices (referred to as Maintenance Best Practices or MBPs), in consideration of environmental ~~considerations~~ impacts, and to provide for public awareness ~~relations~~ and community outreach. ~~which will better inform the public in a more transparent process on how these features will be maintained. A draft copy of~~ The ~~the~~ *Guide Book* is attached as Appendix A. As described in more detail below, NYSCC's State Environmental Quality Review Act (SEQR) action is the adoption of the *Guide Book* and all future activities performed in accordance with the *Guide Book* along earthen embankments in the Canal System.

1.2 New York State Environmental Quality Review Act

New York's State Environmental Quality Review Act, which is contained in Article 8 of the Environmental Conservation Law, declares that it is the State's policy to:

> *"… encourage productive and enjoyable harmony between man and his environment; to promote efforts which will prevent or eliminate damage to the environment and enhance human and community resources; and to enrich the understanding of ecological systems, natural, human and community resources important to the people of the state."*

The basic purpose of SEQR is to incorporate the consideration of environmental factors into the ~~*existing*~~ planning, review, and decision-making processes of State, regional, and local government agencies at the earliest possible time. Consistent with this intent, SEQR requires all State and local government agencies to analyze and mitigate potentially significant environmental impacts when deciding to approve or undertake an action. To accomplish this overarching goal, agencies are required to assess the environmental significance of all actions they have discretion to approve, fund, or directly undertake, unless exempt or excluded by SEQR or its implementing regulations. If the proposed action may result in a significant adverse impact, an Environmental Impact Statement (EIS) must be developed.

Pursuant to SEQR regulations (6 NYCRR Part 617 and 21 NYCRR Part 461), NYSCC completed Part 1 of a Full Environmental Assessment Form (FEAF) and sent it with a letter dated June 27, 2019 to potential involved and interested agencies as part of a coordinated review. As the state agency that is responsible for maintaining the NYS Canal System, the letter declared the intention of NYSCC to be the lead agency and requested the concurrence that NYSCC should be the lead agency. NYSCC then completed Parts 2 and 3 of the FEAF and determined that the proposed EEIP may have a significant adverse impact on the environment. In a letter dated October 23, 2019, NYSCC informed the potential involved and interested agencies that pursuant to 6 NYCRR Part 617, NYSCC is undertaking scoping of its EEIP to identify the issues to be addressed in a Draft Generic Environmental Impact Statement (GEIS). The Positive Declaration was also posted in the New York State Department of Environmental Conservation (NYSDEC) Environmental Notice Bulletin (ENB) on October 30, 2020. A Draft Scoping was prepared and sent to potential involved and interested agencies in a letter dated May 29, 2020. After a review of comments received, the Final Scoping document was completed, distributed and posted in the NYSDEC's ENB on February 3, 2021. ~~and posted in the NYSDEC's ENB on.~~

When an EIS is required under SEQR, that requirement may be satisfied by the preparation of a GEIS in several circumstances, including, as here, where the Earthen Embankment Integrity Program consists of an entire program or plan having wide application or restricting the range of possible future alternative policies or projects. The regulations (6 NYCRR §617.10) indicate

that a GEIS is the appropriate mechanism for assessing environmental impacts.[1] A GEIS is broader and more general than a site- or project-specific EIS, providing a discussion of the potential constraints and consequences of a proposed action(s) based on the analysis of a limited number of hypothetical scenarios.

A GEIS also may identify the important elements of the natural resource base, as well as existing and projected cultural features, patterns, and character. SEQR requires that a draft GEIS be made available for public comment. The lead agency then must consider the comments and prepare a final GEIS before reaching a decision on the action being considered.

The SEQR Handbook notes that "interested agencies, organizations, and individuals may participate by:

- Contributing relevant scoping topics, either through written communication to the lead agency or at public scoping sessions, if such sessions are called for by the lead agency;
- Submitting written comments during the draft EIS comment period; and
- Commenting on the draft EIS at public hearings."[2]

SEQR further contemplates that after preparing a GEIS for a broader program, the appropriate state, local, or federal agency may need to conduct supplemental project- or site-specific environmental review when specific components of the program are proposed.

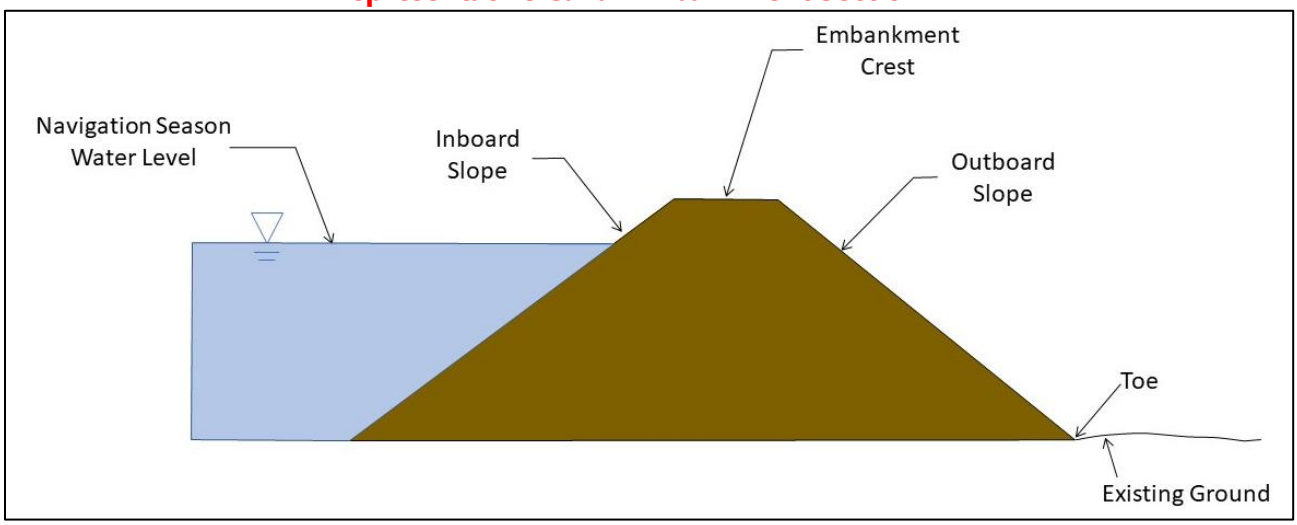
Once the GEIS process is completed, the NYSCC will implement the *Guide Book* for ~~all future~~ earthen embankment maintenance activities. The environmental impacts of activities identified in the *Guide Book*, ~~Actions not addressed as part~~ individually and in aggregate, are considered within the scope of this GEIS. ~~or contemplated in the *Guide Book* will be addressed pursuant to separate SEQRA compliance.~~ Chapter 8 of the *Guide Book* includes provision for ~~environmental screening for~~ evaluating and addressing site specific EEIP activities ~~sufficient~~ to ensure ~~confirm~~ that the ~~conditions of the~~ Final GEIS ~~are~~ is being met. ~~and thresholds are not exceeded as discussed further in Section 1.3.4.~~

[1] 6 NYCRR § 617.10(a)(4). The required contents of an EIS are listed in the regulations that implement SEQR (6 NYCRR §§ 617.9 and 617.10).

[2] New York State Department of Environmental Conservation, *The SEQR Handbook*, Fourth Edition (2020), 67.

1.3 Project Description

Figure 1.3-1: Embankment Features Revised
Representative Canal Embankment Section



Note: Section slope is typical design section. Actual slope may vary.

The proposed action involves adopting the *Guide Book* and implementing the EEIP to restore, maintain and manage the integrity of earthen embankments located throughout the NYS Canal System. The EEIP ~~will~~ requires thorough, regular, and systematic inspections of canal and feeder embankments. This ~~will be~~ is followed by prioritization and implementation of maintenance by embankment segment. Implementation will include the specific maintenance actions to address damaged linings, inadequate drainage, installing instrumentation, repairing surfacing, protecting embankment slopes, correcting embankment geometry deficiencies, removing vegetation, filling animal burrows, ~~and~~ repairing seeps, and related activities as~~. The EEIP, and the specific maintenance guidance covering the maintenance actions are~~ described in detail or referenced in the *Guide Book*.

The EEIP applies to water impounding earthen embankments and features that abut, are within, and are parallel to the embankments. Maintenance of individual structures (e.g., spillways, waste weirs, vertical walls, culverts and dive culverts) located along the embankments or under the embankments are not included in the EEIP. ~~These individual structures are inspected pursuant to other Canal Corporation protocols subject to SEQRA compliance.~~ The EEIP scope does include all embankment material and impairments, along with turf, vegetation, armoring or paving that is parallel to the embankment slopes and surfaces from outside the toe of the outboard slope of the canal or feeder to the toe of the inboard embankment slope (See **Figure *1.3-1***). It also includes water level recording and management features used in regulation of water levels in the canals and feeders, and geotechnical instrumentation devices.

Implementation of the EEIP would be through in-house maintenance, contract maintenance or as part of capital improvements. All work covered under the EEIP would be performed on lands under jurisdiction of the NYSCC or on lands where the NYSCC has permanent easements that allow the work of the Embankment Maintenance Program to be carried out. In addition, where necessary for activities under the EEIP, NYSCC may obtain temporary easements, access agreements, or grading releases, ~~if required~~ for purposes of access ~~would be obtained~~ to a project or ~~embankment segment by~~ segment ~~by the NYSCC~~.

The estimated cost for implementing the initial embankment repair/restoration ~~basic components~~ for the EEIP ~~this alternative~~ is $2M to $4M per mile of embankment ~~on both sides of the canal or feeder~~ based on 2019 estimates.[3] Due to the previous long period of deferred maintenance, many embankments will require tree clearing on the crest and land side, stump removal, regrading, surface repairs, filling of animal burrows, ~~minor~~ repair of drainage facilities, revegetation and other necessary mitigations, and repair of erosion protection on the inboard side of canals and feeders consistent with Chapter 3 of the DGEIS and the *Guide Book*. Subsequent costs of the EEIP will be substantially less.

The process for implementing the ~~proposed project~~ EEIP includes the following steps:

1. Identify and locate canal and feeder embankment segments based on desktop reviews followed by field visits. Verify the NYSCC rights-of-way and easements within canal and feeder embankment segments.

2. Utilize the risk assessment ~~screening~~ process summarized in Section 1.3.3 below, and described in further detail in Section 3.4 of the *Guide Book,* to identify the risk potential associated with each embankment segment and prioritize the order in which embankment inspections would be completed and what specific EEIP activities will be scheduled ~~programmed~~.

3. As canal and feeder embankment segments are identified and scheduled for EEIP activities, record plans, existing mapping, technical reports, and previous inspection reports would be reviewed. A field visit would be performed of canal and feeder embankment segments as described in Section 4 of the *Guide Book*.

4. Perform site-specific ~~environmental screening~~ evaluations as described in Section 8 of the *Guide Book* sufficient to confirm that the conditions of the GEIS are being met and consideration of thresholds ~~are not exceeded~~ as discussed further in Section 1.3.4~~. The substance of these screenings will depend~~ which is based upon the ~~nature of~~ location and condition of the site and the ~~anticipated~~ proposed EEIP activities~~. being considered~~

[3] Where earthen embankments are on both sides of a specific segment, each mile of that canal segment would contain two miles of embankment.

~~for that segment. As appropriate, the screening will include~~ This evaluation may also consider~~ations of required~~ regulatory permitting, ~~environmental~~ health and safety, and other impacts discussed in Chapter 3 of this GEIS ~~and as described in Section 8 of the *Guide Book*~~.

5. Develop work plans and external communications, which includes ~~Conduct as necessary~~ conducting public relations and community outreach ~~to explain the proposed project to the affected public~~ as described in Sections 9 and 10 of the *Guide Book*.

6. Schedule and perform work EEIP activities on that embankment segment for the specific project. ~~Carry out the required EEIP activities, in accordance with the *Guide Book*.~~

1.3.1 Purpose, Need and Benefit of the Project

The purpose of the EEIP is to ~~restore~~ ensure ~~the~~ integrity of earthen embankments~~, a capital asset,~~ and improve the NYSCC's continued ability to properly maintain its assets ~~embankments~~ in a cost-effective manner that ~~so that~~ reduces ~~the~~ risks to the Canal System, NYSCC staff, nearby people and property-owners, and the environment that may result from the ongoing condition of the earthen embankments ~~from flooding due to embankment failures is reduced~~. EEIP activities are ~~This work involves the proper maintenance of embankment features as~~ described in the *Guide Book*. NYSCC views ~~Without~~ implementation of the EEIP ~~an embankment maintenance program,~~ as a necessary component of its asset management to reduce the risk of conditions that could compromise embankment integrity and avoid costly future impacts ~~s will continue to be weakened by various forms of deterioration, and the NYSCCs ability to detect deficiencies will remain significantly impaired~~.

When construction of the original Erie Canal began in 1817, there were no consistent engineering standards or regulatory requirements that were commonly applied to the materials, or the construction practices used to build canal embankment sections, feeders, or dams. The effects of the lack of design and construction standards, and inadequate maintenance of dams, have been devastating in terms of life loss and property damage and are well documented in individual dam failure histories by such authors as Sharpe[4] and McCullough[5] and by Foster, et al.[6]

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4 Elizabeth M. Sharpe, *In the Shadow of the Dam: The Aftermath of the Mill River Flood of 1874* (New York: Free Press, 2007).

5 David McCullough, *The Johnstown Flood: The Incredible Story Behind One of the Most Devastating Disasters the World Has Ever Seen* (New York: Simon and Schuster, 2017).

6 Mark Foster, Robin Fell, and Matt Spannagle, "The Statistics of Embankment Dam Failures and Accidents." Canadian Geotechnical Journal 37, no. 5 (October 2000), https://dx.doi.org/10.1139/cgj-37-5-1000.

~~Today, in New York State,~~ While earthen embankments may not be specifically addressed in laws and regulations pertaining to the protection of waterbodies, other man-made water impounding structures are addressed. ~~D~~ Dams ~~that~~ are ~~not otherwise~~ regulated federally by the Federal Energy Regulatory Commission (FERC) or United States Army Corps of Engineers (USACE)~~, are~~, and also ~~regulated~~ under state laws. In New York, those laws are implemented through New York State Department of Environmental Conservation regulations at 6 NYCRR 673 and through guidance manuals, such as ~~by~~ *Guidelines for the Design of Dams*[7]. ~~Although canal and feeder earthen embankments are not regulated as dams, these embankments do retain water for certain parts of the year and uncontrolled breaches could result in damage to life and property~~ Given the similar functions and risks, ~~. As such,~~ NYSCC views the laws, regulations, standards and other guidance documents related to dams as being informative of prudent practices for the management of earthen embankments ~~dam maintenance and inspections are utilized by the NYSCC as part of its inspection and maintenance program of these earthen structures and referenced in this GEIS and the Guide Book~~.

The NYSCC has experienced, in recent years, several incidents involving canal and feeder embankments that have been closed and repaired under costly emergency contracts. In June 2016, a partial failure of Culvert 70 near Hulberton, NY required extensive and costly repairs and closed the Erie Canal and Erie Canalway Heritage Trail for over 2 weeks. Emergency repairs were required during April and May 2018 at canal embankment sections of the Erie Canal in Perinton and Ogden, NY. Sheet piling was installed at the top of canal embankment sections to reduce the risk of embankment failure. In July 2018, a section of the Forestport Feeder had to be dewatered to conduct slope repairs in the section along Moose River Road in Boonville, NY. The feeder and adjacent trail were affected for most of July. These experiences have made it clear that NYSCC's approach of addressing maintenance matters when water impounding embankment features are about to fail is an unacceptable way in which to manage this large capital asset. Performing maintenance following the identification of an imminent failure of a feature usually results in: costly emergency construction contracts; significant adverse effects on operations; disruption of workflow of canal staff must divert their attention to the emergency at hand; unplanned closure of the canal or feeder segment where the failure has occurred; and closure of the trail segment. And not least is the potential for property damage and loss of life.

In summary, the need for the EEIP is to reduce the significant risk exposure presented by aging embankments, and to better manage NYS Canal System assets by performing regular and periodic inspections, prioritizing corrective action and implementing maintenance in accordance with the *Guide Book*. Without compromising safety or regulatory compliance, the significant environmental impacts identified and included in the scope of GEIS will be mitigated through processes identified in the *Guide Book*. ~~maintaining existing community character will be done to the greatest extent practicable.~~

[7] New York State Department of Environmental Conservation, Division of Water, *Guidelines for Design of Dams*, Revised January 1989, accessed December 10, 2010, https://www.dec.ny.gov/docs/water_pdf/damguideli.pdf.

The public benefits of the Project include:

- Reduction in the risk of life loss, and damage to private property, public infrastructure, utilities, and the environment. This will be accomplished by prioritizing embankment maintenance on the basis of condition, hazard classification and risk urgency.
- Better use of programmed maintenance dollars, by significantly reducing the percentage of the total capital and maintenance budgets devoted to emergency repair work.
- Greater availability of the canals and feeders for recreational use, commerce, and for other beneficial uses including irrigation as the frequency and extent of canal and trailway closures will be significantly reduced.
- Improvements to safety through eliminating, mitigating, or controlling exposure to hazards from water flow, human activities, environmental factors or water impounding structures in accordance with the *Guide Book*.

1.3.2 Location and Physical Dimensions

Earthen embankments may be found in the modernized portion of the NYS Canal System, as well as in the remnant canals and feeders both described in Section 1.1. The area where embankments may be found is labeled in **Figure *1.1-1*** as the "project area." The extents of the NYS Canal System covered by the proposed action are illustrated on a series of maps presented in Appendix C. Work covered under the EEIP will be performed on earthen embankments as found on lands under jurisdiction of the NYSCC or on lands where the NYSCC has permanent easements that allow the work of the project to be carried out. In order to accommodate the potential for temporary access by means of temporary easements or a Site Access/Vegetation Management Permit, an additional 100 feet beyond property under jurisdiction of the NYSCC is included as part of the project area.

Canal and feeder embankments used to impound the NYS Canal System waters occur where the normal canal water surface elevation is higher than the natural ground elevation (or adjacent ditch elevation) at the outboard toe of slope. An embankment typically includes the outboard slope, top width section (crest), and inboard slope as shown in **Figure *1.3-1***.

A full inventory of embankments on the NYS Canal System has not been completed but is underway. The project area for this GEIS has been selected to include most NYS Canal System lands such that when embankments are located within the GEIS project area, future embankment maintenance will be covered by the impact thresholds set up through this GEIS. A detailed presentation of the GEIS project area is provided in the series of maps comprising Appendix C.

The extents of the NYS Canal System covered by the proposed action are illustrated on a series of maps presented in Appendix C. It is estimated that the NYSCC has jurisdiction over approximately 54,000 acres in the 166 municipalities. The municipalities are listed in Appendix D.

As of this writing, approximately 130 miles of earthen embankments have been identified in the project area. The locations of these embankments are depicted in Figure 1.3-2 below. This GEIS applies to the entire project area as depicted in Figure 1.1-1, because other earthen embankments may be identified in the project area in the future. The 130 miles of embankments identified to date provide an illustration of earthen embankments in the project area, and the potential for environmental impacts. Table 1.3-1 provides a breakdown of the lengths of earthen embankments for each county where they have been identified. Since earthen embankments may be found on either or both sides of the canal in any specific location, Table 1.3-1 compares the lengths of embankments with the lengths of both banks of the canal.

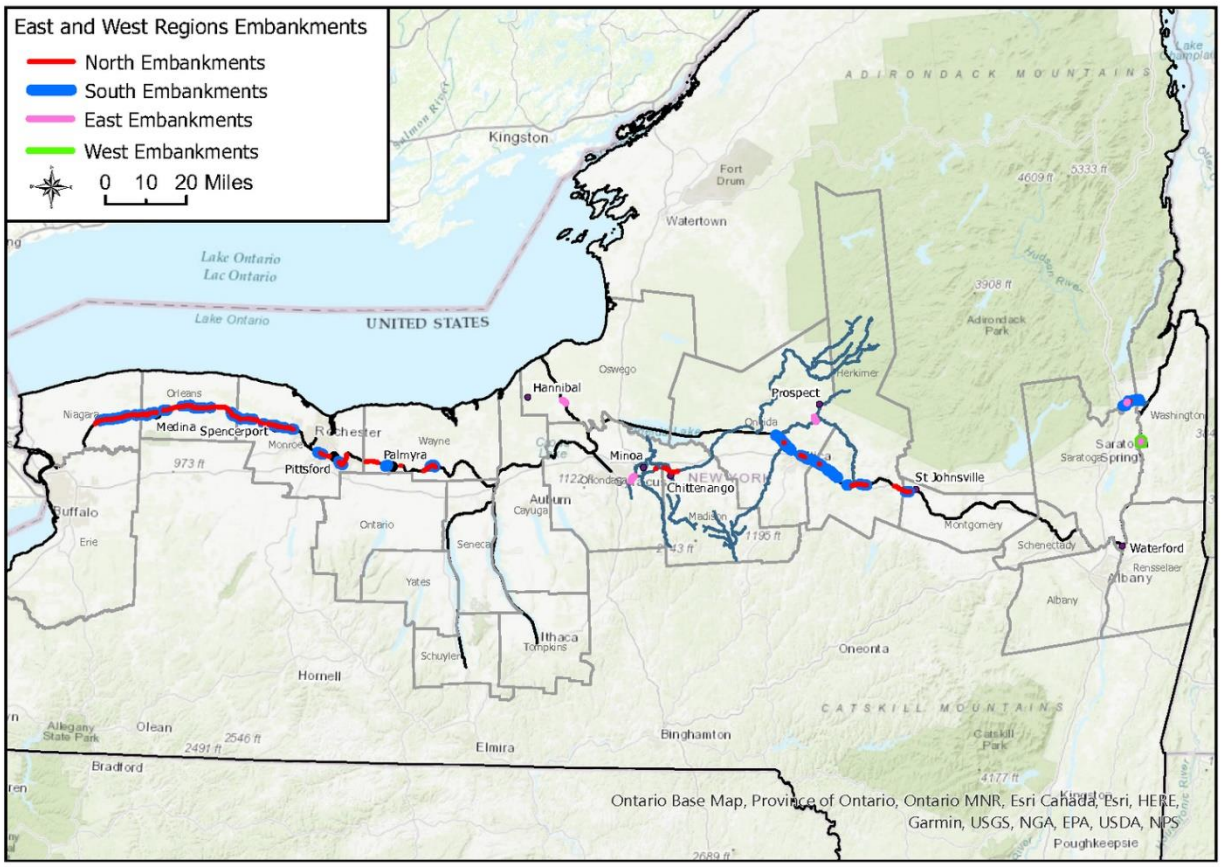

Figure 1.3-2: Approximate Locations of Earthen Embankments Identified to Date

Table 1.3-1: Embankment Lengths in Relation to Length of Canal Banks

County	Embankment Lengths (miles)	Canal Bank Lengths (miles)	Percent of Canal Banks that are Embankments
Herkimer	13.9	68.8	20.2%
Madison	6.2	67.1	9.2%
Monroe	23.4	99.5	23.5%
Montgomery	8.5	118.6	7.2%
Niagara	17.0	56.1	30.3%
Oneida	10.6	158.4	6.7%
Onondaga	8.8	127.0	6.9%
Orleans	26.9	59.6	45.1%
Oswego	1.2	83.5	1.4%
Warren	4.1	9.1	45.1%
Washington	0.4	123.6	0.3%
Wayne	9.3	88.2	10.5%
	130.3	**1,059.5**	**12.3%**

1.3.3 Prioritization of Embankment Segment Maintenance

Public agencies in the United States must address the risks and benefits associated with their dam and levee portfolios. The USACE has completed the first summary report of the flood risks and benefits associated with over 14,000 miles of levees within its levee safety program.[8] The USACE approach considers risk as a function of the hazards, performance and consequences as shown in **Figure *1.3-2***.

[8] U.S. Army Corps of Engineers Levee Safety Program, *Levee Portfolio Report: A Summary of Risks and Benefits Associated With the USACE Levee Portfolio*, March 2018, accessed December 10, 2020, https://usace.contentdm.oclc.org/utils/getfile/collection/p266001coll1/id/6922.

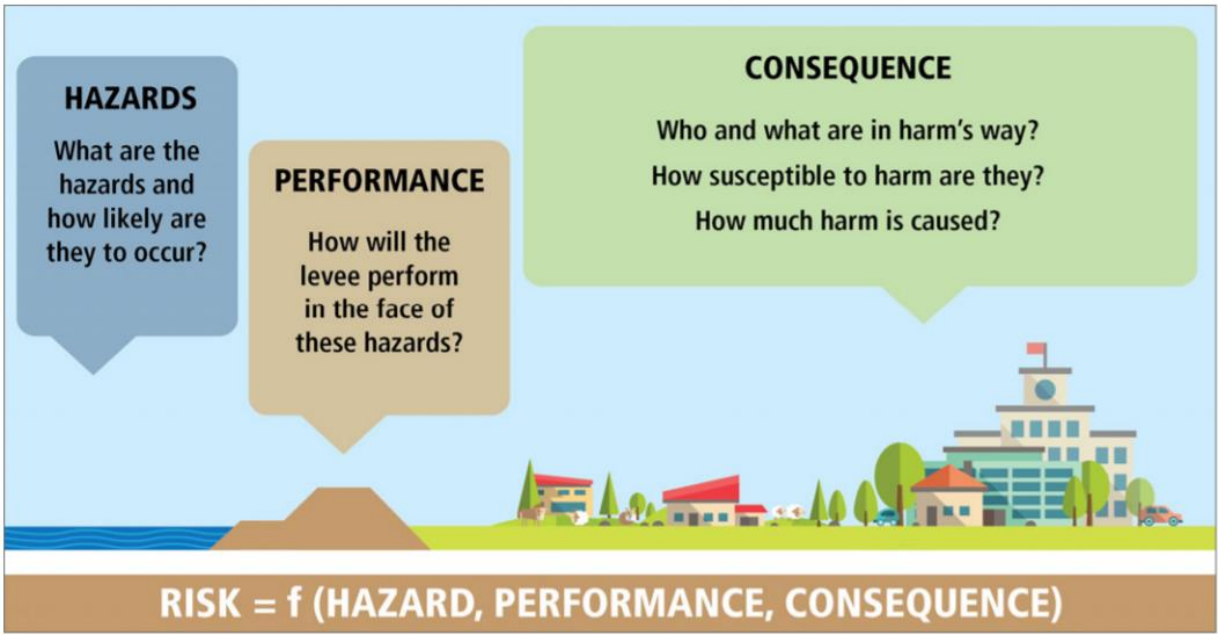

Figure 1.3-3: USACE Risk Equation[9]

Based on a review of dam safety regulations and guidelines, and recent capital and maintenance work on several canal embankment segments, the NYSCC developed a methodology currently being used to prioritize embankment maintenance based on three measures that are similar to the USACE approach: hazard classification, condition, and risk urgency. NYSCC's hazard classification is based on Federal Emergency Management Agency (FEMA) and NYSDEC hazard class guidelines. The New York State Department of Transportation (NYSDOT) rating system is used to rate embankment segment condition. Risk urgency is based on the FEMA joint risk rating which is a classification of action priority and urgency to address a dam safety emergency based on condition and failure potential, and likely risk or consequence outcome. These are described in more detail in Section 3 of the *Guide Book* and in Appendix B, *Risk Exposure Presented by Canal Embankments*.

1.3.4 Thresholds for Consideration of Alternative EEIP Activities

There are site-specific situations where the proposed EEIP activities may result in significant social, economic, and environmental impacts. Such situations are listed in **Figure *1.3-1***, Regulatory and Community Thresholds. The procedures for determining a threshold exceedance involves screening during both planning and design of embankment segments as described in Section 8 of the *Guide Book*. The general procedure is outlined as follows:

[9] USACE, *Levee Portfolio Report*, 23.

1. Perform a desktop inventory for the segment where work is being planned. This includes a review of State and Federal websites and databases, including those for threatened or endangered species, historic resources, locations of public parks, existence of Critical Environmental Areas, and municipalities with approved Local Waterfront Revitalization Programs.

2. Where a community comprehensive plan or other community development plans are not available on a website, attempt to obtain the latest comprehensive plan or other plans from the community(ies) where the work will be located. At least one request will be made, and at least 30 days will be allowed for a response.

3. Review conceptual/preliminary embankment and maintenance engineering plans developed for the segment for a more detailed description of the area that may be impacted.

4. A site inspection should be performed prior to final design to confirm and assess any resources identified in the desktop inventory and where the plans show a potential for impact to environmental attributes identified in Chapter 3.

5. Evaluate Zones 2B and 3 of the embankment in locations where the threshold applies and develop a minimum of two alternatives to present to the Community Task Force (see Section 10 of the Guide Book) ~~to see if opportunity exists for leaving some mature trees in place~~.

6. Identify any studies needed for historic resources (e.g., Phase 1 Archaeological Resource Studies) or endangered species site survey (e.g., mussel survey, rare plant survey).

Table 1.3-2: Regulatory and Community Thresholds

Regulatory: Federal or State rare, threatened, or endangered plant species are located on NYSCC property or on adjacent lands that would experience an incidental take as defined in 6 NYCRR Part 182 as a result of being disturbed by EEIP activities.
Regulatory: EEIP activities would significantly reduce or degrade occupied habitat (as defined in 6 NYSCRR Part 182) used by any rare, threatened or endangered species.
Regulatory: EIPP activities would significantly reduce the quantity or quality of the resource or characteristic which was the basis for its designation as Critical Environmental Area.
Regulatory: EEIP activities that would cause the loss of any wetlands in the Montezuma Marshes National Natural Landmark as identified in Section 3.3 of the Generic EIS.
Community: NYSCC property where EEIP activities are contemplated involves or is adjacent to a public park, and those activities would significantly impair the park's aesthetic, historic or recreational function.
Regulatory: Where historic resources listed or eligible for inclusion in the State or National Registers of historic places, are located on or in close proximity to NYSCC property where EEIP activities are contemplated, and the EEIP activities would result in a determination of an adverse effect on the historic resource by the Agency Preservation Officer or the SHPO.
Community: Where an aesthetic resource of local importance has previously been ~~identified through~~ officially designated as an aesthetic resource in an adopted comprehensive plan or zoning and is located on or immediately adjacent to lands where EEIP activities are contemplated and where those activities would significantly damage the aesthetic character of the resource. See note (1) below for NYSDEC reference document.
~~Where EEIP activities would significantly adversely affect an aesthetic resource of Statewide Significance derived from one or more of the categories identified in Section VI.A., of NYSDEC Program Policy DEP-00-2 "Assessing and Mitigating Visual and Aesthetic Impacts," http://www.dec.ny.gov/docs/permits_ej_operations_pdf/visualpolicydep002.pdf.~~
Community: Where EEIP activities are inconsistent with an approved Local Waterfront Revitalization Program (LWRP) in accordance with the New York State Waterfront Revitalization of Coastal Areas and Inland Waterways Act (NYS Executive Law, Article 42).

Note:

(1) NYSDEC Program Policy DEP-00-2 "Assessing and Mitigating Visual and Aesthetic Impacts," http://www.dec.ny.gov/docs/permits_ej_operations_pdf/visualpolicydep002.pdf

~~For embankment segments where any of a regulatory and community threshold in Figure 1.3-1are exceeded, the following actions~~ Where exceedances of community thresholds are identified, the following steps would be taken as shown in **Figure *1.3-1***:

1. Remove trees and brush smaller than 3 inches in diameter at breast height (DBH) that impede inspections and trees larger than or equal to 3 inches DBH that are dead, diseased, and imminently dangerous to property and people. Provide, as necessary, emergency response to stabilize embankments.

2. Perform an embankment condition survey and a tree inventory with an arborist, landscape architect, and engineer to assess the potential of preserving any trees. The arborist would determine the tree's health and viability; the landscape architect would determine the aesthetic suitability of the preserved tree within the context of the overall project limits; and the engineer would determine the feasibility of its retention with respect to its effect on embankment integrity and trail user safety. Develop a minimum of two viable alternatives, such as: (a) a baseline conceptual design retaining healthy, non-invasive trees in Zones 2b and 3 (as defined in Section 6 of the *Guide Book* and in Section 3.2); (b) a conceptual design with limited tree removal to facilitate necessary corrective actions to address identified seeps (healthy trees equal to 3" DBH and greater remain outside Zone 2B and 3); or (c) confirm compatibility of performing enhanced inspections and engineering evaluations over a 5-year period in lieu of executing the conceptual designs. and an embankment condition survey. ~~Identify the limit of Zones 2B and 3 on the involved earthen embankment. This would be used to develop mitigation or alternative EEIP procedures as described in Section 3.9.4 of this GEIS.~~

3. Engage with community task force ~~stakeholders~~ based on specific thresholds identified. ~~Conduct public relations and community outreach for those activities with affected stakeholders through a Community Advisory Group (CAG~~). Community task force members will review and discuss the conceptual designs provided by the NYSCC that mitigate aesthetic effects and indicate which of the NYSCC conceptual designs is preferred considering the overall project schedule. All final conceptual designs must consider the results of the embankment condition survey and be approved by the Engineer of Record.

4. If ~~any are appropriate,~~ a different conceptual design can be agreed upon and approved by the Engineer of Record, these measures would be implemented and the EEIP activities would continue as prescribed in the *Guide Book*. If none of the ~~mitigation~~ measures conceptual designs involving additional tree removal are determined to be appropriate by the Engineer of Record, continue with Action Item 5 below. No additional tree removal beyond that described in Action Item 1 above occurs in any zones; however, NYSCC will stabilize and establish appropriate ground cover.

5. Perform more detailed inspections, including detection of embankment seepage and embankment stability monitoring. The prescribed content and frequency of inspections is provided in the *Guide Book*. These include bi-weekly to monthly Bank Walk Inspections and quarterly Enhanced Embankment Monitoring for a more detailed investigation.

6. If the results of the initial seepage monitoring suggests that the embankment is stable, a seepage and monitoring program would be developed and implemented. Perform additional surface stabilization as needed to prevent surface erosion. Monitoring may include: piezometers, slope indicators, observation wells and seepage weir boxes. Seepage and stability monitoring would continue for an additional 5 years if the gathered

information suggests that the embankment is stable. Following the five years, the earthen embankment would be reassessed and the *Guide Book* procedure would commence again as shown on **Figure *1.3-4***. During the 5-year monitoring period, dead and dying trees would be removed.

7. If the results of the seepage and stability monitoring indicate instability or that safe conditions are deteriorating, corrective, large scale engineering solutions possibly extending over entire embankment segments could ~~would~~ be implemented (e.g., sheet piling, clay cutoff walls, lining the canal, etc. as noted in Figure 1.3-4. Such solutions are not addressed in this GEIS. Implementation of corrective engineering solutions would be considered a separate site-specific action under SEQR and would be reviewed accordingly.

~~A decision tree is shown in~~ **Figure *1.3-4*** below ~~illustrating~~ illustrates the evaluation and corrective action process for Canal embankments, where regulatory or community thresholds shown in **Table *1.3-1*** are exceeded. If at any time, safety and conditions elevate to an emergency condition, such conditions shall be remediated pursuant to NYSCC emergency response procedures.

Scenic Management Guidelines for Projects Where Community Thresholds are Exceeded

The following scenic management guidelines should be considered as part of developing conceptual designs for embankment segments where community thresholds are exceeded.

1. No trees located within Zone 1 will be allowed to remain because of the need to maintain navigation safety.
2. Where a recreational trail is present, no tree in Zone 2A and 2B should be allowed to remain within the allowable clear zone distance specified outside the edge of travel way in accordance with AASHTOs Guide for the Development of Bicycle Facilities (AASHTO, 2012).
3. In areas where there is a very wide Zone 2B relative to embankment height, tree vegetation (equal to or > 3" DBH) and that is not an invasive species, is healthy, is not a danger tree, and is outside the allowable AASHTO clear zone, should be preserved to the greatest extent possible.
4. Pollinators and Vegetative Screening Plantings found in Attachment 1, are optional features that may be added to the development of conceptual designs within Zones 2B and 3 when requested by the Community Task Force (see Section 10 of the *Guide Book*).
5. In locations where seepage controls are required by the Engineer of Record, NYSCC will make all possible efforts to provide seepage controls (typically located in Zones 4 and 5) that do not include exposed gravel surfaces but buried gravel covered with new turf; however, where exposed stone linings are required for toe drains and filter blankets, within the viewshed of the trail or waterway a blend of standard dolomite stone meeting NYSDOT material and size

specifications, and Medina stone or some other suitable stone would be installed to minimize the visual impact. This would match treatment in other historic sections of the canal.

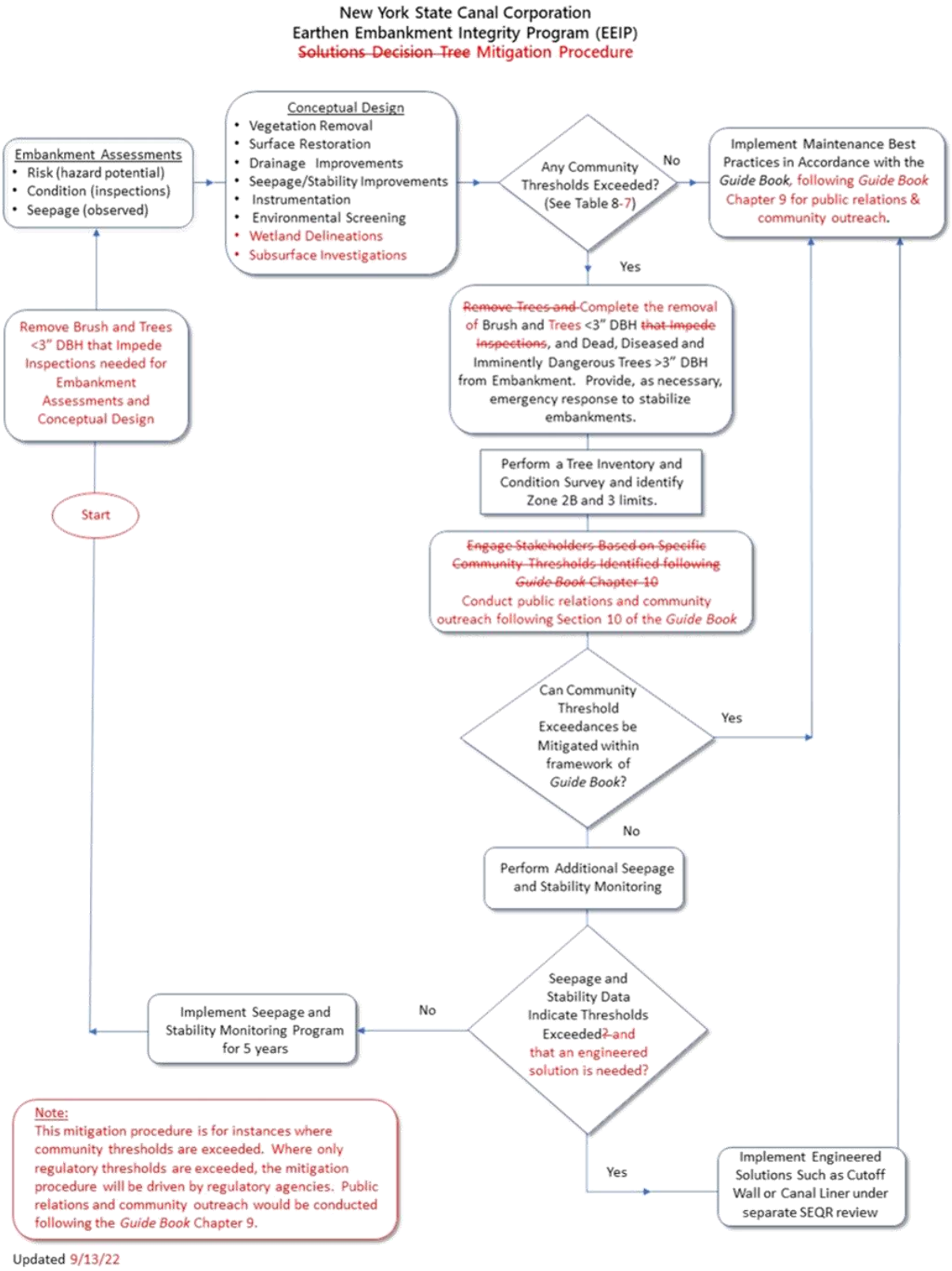

Figure 1.3-4: EEIP Mitigation Procedure ~~Solutions Decision Tree~~

1.3.5 Timing and Schedule

The timing and schedule of implementation of the EEIP will depend upon several factors including: the progress on identification and prioritization of embankment segments; available funding for NYSCC capital projects and maintenance; and the relationship of the EEIP to other capital projects being implemented along the NYS Canal System. Many of the EEIP activities will be performed during the non-navigation season that typically occurs between November 1 and May 1 because many portions of the non-riverine canal system are dewatered during the non-navigation season. Maintenance activities involving excavation of the embankments pose a far lesser risk when conducted during the non-navigation season. The timing of maintenance activities will also be influenced by environmental and permitting requirements that will be identified through an ~~segment-by-segment~~ Environmental Review performed for individual embankment sections in accordance with Section 8 of the *Guide Book*.

1.3.6 Relationship to Other Plans and Programs

The EEIP is targeted to address embankment maintenance of features that follow the lines and grades of canal and feeder embankments. Other NYSCC programs that are separate SEQR actions, may be either site-specific or programmatic. These include:

Dredging maintenance program: Dredging of the NYS Canal System is typically performed during the navigation season to maintain required navigation depths. NYSCC operates approximately thirty Upland Disposal Sites (UDS) to support maintenance dredging of the canal system under a Section 404 General Permit from the USACE and a Section 401 Water Quality Certification. Removal of sediment from the watered Canal System as part of the EEIP, if any, would be incidental to the maintenance activity and would be disposed of in accordance with required permits.

Dam Safety Maintenance Program: NYSCC also has a portfolio of approximately 100 ~~80~~ dams that is managed under a dam safety maintenance program developed in 2017. That program is based upon many of the same inspection, prioritization and maintenance actions that are included in the EEIP. Maintenance of dams is being progressed as a separate program, and any SEQR Unlisted or Type I actions, particularly those involving a large capital expense, are progressed as individual SEQR actions.

Maintenance of Structures Integrated Into the Embankments: Structural features are located adjacent to and within the canal embankments. The maintenance of these features, other than cleaning debris, is outside of the scope of the EEIP. These structural features include: culverts and dive culverts; waste weirs and spillways; and concrete and masonry walls. The rehabilitation or replacement of these features are progressed as individual actions under SEQR.

1.3.7 Approvals and Permits Required

Although the NYSCC is not subject to local laws, EEIP activities will require a site-specific Environmental Review to identify any required environmental permits or other site-specific constraints. Topics for environmental review are described in Section 8 of the *Guide Book* and include:

- erosion and sediment control,
- threatened and endangered species,
- surface waters and wetlands,
- cultural resources,
- invasive species,
- noise,
- dust control,
- floodplains,
- coastal consistency,
- recreational traffic,
- easements and temporary work space, and
- permitting requirements.

2 ALTERNATIVES CONSIDERED

2.1 Null or No-Action Alternative

The null or no-action alternative assumes ~~perform~~ minimal effort by NYSCC to meet its statutory duties~~is to ignore earthen embankment conditions~~. NYSCC is required by law to perform annual inspections of the Canal System and maintain the Canal System in good condition, which includes the earthen embankments. Under this alternative, trees and vegetation would be allowed to grow on embankment slopes, weakening them and creating seepage paths. The complete absence of a program means there is no active monitoring and inspections of earthen embankment conditions, and there are no policies or guidelines for evaluating and prioritizing embankment maintenance and repairs. This approach does not adequately address the risks posed by the current earthen embankment conditions nor provide an efficient and effective long-term solution for ensuring safe operation of the canal system. ~~With no monitoring and maintenance activities, NYSCC will fail to meet its statutory duty and the earthen embankments would be left to fail.~~

2.2 Ad-Hoc Alternative – Project-By-Project Approach

The ad hoc alternative is an approach to managing earthen embankments without the benefit of a formalized program. An ad hoc approach could include an undefined range of actions to identify and address embankment conditions, but lacks clearly defined, cohesive planning processes to ensure long-term integrity of earthen embankments. Ad hoc approaches include undertaking actions based on past practices, informal or individual decision-making that may consider availability of resources (time, funding, personnel, equipment, etc.) and severity of identified conditions, or limiting actions to those needed to meet legal, regulatory or permit requirements. The ad hoc alternative also involves implementing embankment maintenance as part of large-scale capital projects to rehabilitate embankments based on engineering evaluations (such as using the structure's hazard rating and a condition assessment rating). Project selection and scope may be determined according to need and/or availability of resources.

This alternative is a continuation of NYSCC's current practice of non-programmatic and intermittent maintenance and repairs of canal and feeder embankments. Activities may be undertaken through annual inspections and observations of bank walkers, which may identify conditions that require NYSCC's attention to maintain the canal system in good condition as required by the Canal Law. Trees and vegetation growth on embankments are managed at times where it interferes with NYSCC's ability to inspect or conditions arise that necessitate immediate action to address loss of integrity; however, there is no prioritized embankment maintenance systemwide based on embankment condition, hazard classification, and risk urgency.

The ad hoc approach is not holistic and does not provide for a long-term strategy for managing and maintaining embankment integrity. Risks to embankments may continue, allowing them to be weakened by various forms of deterioration and impairing NYSCC's ability to provide assurances that it can detect and address deficiencies in an efficient manner. When issues are identified, they could require costly, on-call emergency construction contracts. Emergency maintenance and repairs can disrupt NYSCC operations and cause unscheduled closures of canal system segments and trails. Staff resources would have to be diverted to respond to emergency closures impacting other important maintenance and capital projects along the canal systems.

An ad hoc approach to embankment integrity may be less protective of the environment. Actions are not considered in a holistic context across the canal system, but only reviewed in the limited scope of individual projects. While this may not run afoul of regulations and caselaw for impermissible segmentation of a project, cumulative impacts that could have been considered programmatically may be missed. In addition, when emergencies do occur, environmental review of the action is excluded from review under SEQR, which further limits a robust and complete assessment of environmental impacts of NYSCC's activities.

The scope of the embankment maintenance portion of the work would include all embankment material, turf, vegetation, armoring or paving that's parallel to the embankment slopes and surfaces from outside the toe of the outboard slope on one side to the toe of the outboard slope on the other side. It would include water recording and management features used in regulation of water levels in the canal or feeder, and geotechnical instrumentation devices. Compared to the null/no action alternative, this alternative would provide for more thorough, regular, and systematic inspections of embankments, which would aid in determining the scope and schedule of capital projects and other embankment integrity repairs and maintenance.

Ultimately, this alternative would address over time, the existing under-maintained conditions of the embankments. Eventually, this approach would significantly reduce the risk of embankment breaching in locations of the NYS Canal System where capital projects have been implemented. However, the public would continue to be exposed to risk of embankment breaching for a period of time, until the embankments are restored.

This alternative would not differentiate between capital and operations and maintenance costs. While capital programs have long been used by NYSCC and other public agencies for the major rehabilitation or replacement of larger infrastructure facilities, the activities needed to provide the necessary initial restoration and future maintenance of embankments is largely a maintenance type program. In addition, spending capital dollars for maintenance activities is inconsistent with normal operations budgeting and programming for both NYSCC and other public entities.

Moreover, in light of a court decision regarding the clearing of trees brought against the New York State Power Authority by the Towns of Pittsford, Brighton and Perinton, the ad hoc

approach would require a separate review under SEQR for each event involving the clearing of trees. Besides imposing implementation challenges, this approach may not provide for full evaluation of the totality of potential environmental impacts over time and distance, which are addressed through conducting this generic environmental impact statement on the programmatic approach. Thus, the ad hoc approach may not have complied with the court order.

2.3 Alternatives Considered and Dismissed

~~Three~~ Four additional alternatives to the proposed action were formulated, considered and dismissed from further consideration.

2.3.1 Drain and Permanent Abandonment

The New York State Constitution requires that the state not abandon the canal system. Maintaining the NYS Canal System water-retaining embankments in a safe, stable state is necessary to preserve their function as engineered structures, to allow for their continued commercial and recreational use, and to protect people and property located adjacent to the embankments and along the streams that pass under the embankments. However, there would be no need to perform the maintenance or restoration activities if portions of the NYS Canal System embankments were permanently drained and abandoned. This alternative would be relatively inexpensive to implement and would have almost no recurring annual operation and maintenance costs. The Erie Canalway Trail and other trails that run parallel to and along the top of one side of the embankment could be retained and maintained, similar to the Genesee Valley Greenway, an unimproved trail that runs between Rochester and Olean that is used for hiking, running, biking, cross country skiing, and similar activities. Some vegetation removal may still be necessary to remove dead diseased, or imminently dangerous trees for the safety of trail users, NYSCC personnel, and people and structures on the adjacent properties.

Draining of the canals and feeders would have significant adverse impacts on tourism and recreational uses because 80% of the Upstate population lives within 25 miles of the Erie Canal. Additionally, the adverse effect on cultural resources, including the NYS Barge Canal as listed in the National Register of Historic Places, and the various National and State Heritage Corridors, community cohesion, recreation, and social-economic impacts would be significant.

Environmental effects of canal and feeder draining would also be significant. Every mile of canal or feeder that is drained would result in loss of aquatic habitat and fish migration pathways. Existing wetlands that have developed since the construction of canal and feeder embankments would be drained, resulting in loss of wetland habitat and function.

While the cost to implement canal and feeder draining and to abandon NYS Canal System embankments may be relatively inexpensive, the long term environmental, social, economic,

cultural resources and recreational impacts would be significant. Thus, this alternative is not a practicable alternative.

2.3.2 Install a Continuous Membrane Along the Canal and Feeder Prisms

Lining the canal or feeder prism[10] with a continuous membrane would reduce or possibly eliminate the phreatic surface[11] within the embankment and alleviate some concerns with seepage and piping failures. Lowering the phreatic surface typically improves the stability of the embankments, thereby reducing the risks of embankment failure. Lining the canal or feeder prism would need to be completed in a manner that protects the membrane from puncture by ship anchors, ship collision, ship propellers, and other potential damage. There are a few products on the market that may sufficiently meet these requirements. Such products would require a lower impermeable membrane, and an upper impermeable membrane or fabric liner that acts as an upper form. These are tied together as a quilt, leaving space for cementitious grout that's field pumped into the cavity to fill the zone between the layers.

Once installed, the top layer would be sacrificial so that damage by anchors, ships or debris, would still leave a thick layer of cementitious grout and the bottom layer intact. No significant substrate preparation would be necessary other than removing large riprap and debris. The grout filled mattress would yield a minimal reduction in the cross-sectional area of the canal or feeder. The completed mattress would not need to be further lined with riprap. The addition of a continuous membrane would have the benefit of eliminating some of the needed vegetation removal, animal burrow filling, and seepage type repairs that would be required under the proposed action. The installation of the liner would result in some temporary impacts to vegetation due to the need to provide sufficient space/room for the equipment and lay down areas. Removal of dead, diseased or imminently dangerous trees would be performed for the safety of trail users, NYSCC personnel, and people and structures on adjacent properties.

The construction-related temporary impacts of this alternative would include ground disturbance, construction noise, and off-site detours of the recreation trail. The greatest potential adverse long term environmental effects would arise from eliminating seepage through the embankments, which may result in changes to the types of vegetation that will be supported on the slopes of the embankments. This alternative could also adversely affect adjacent wetlands and waterbodies since seepage from the embankments that provides a manmade water source would be eliminated. The work would need to be performed over many

[10] The canal or feeder prism is a term used to refer to the actual wetted area of the canal or feeder in section. This term originates from the fact that the top surface of the canal or feeder is wider than at the base making it prism-shaped.

[11] The phreatic surface refers to the upper surface of seepage in an embankment. All the soil below this surface will be saturated when the steady-state seepage condition has been reached.

winter seasons when the embankment sections are drained. The process would require removal of any existing riprap armoring, wash slabs, thick organic deposits, and paving.

Using the two typical, generalized embankment sections described in **Figure *2.3-1*** and **Figure *2.3-2*** below, and based on an 18-foot vertical height to be lined, the quantity of liner material required to line one mile of the respective earth sections would be approximately 900,000 square feet / mile. Based on supplier provided cost information, the cost of the liner material alone would be $26M and $21M/mile, for Figures 2.3-1 and 2.3-2 respectively. The system-wide cost to install continuous membrane in the prism of the 130 miles of canal and feeder embankments that have already been identified to date would range between $2.7B and $3.4B.

On the Erie Canal from Waterford to Three Rivers (where the Oswego, Seneca and Oneida confluence), the typical canal prism and generalized embankment section is shown in **Figure *2.3-1***.

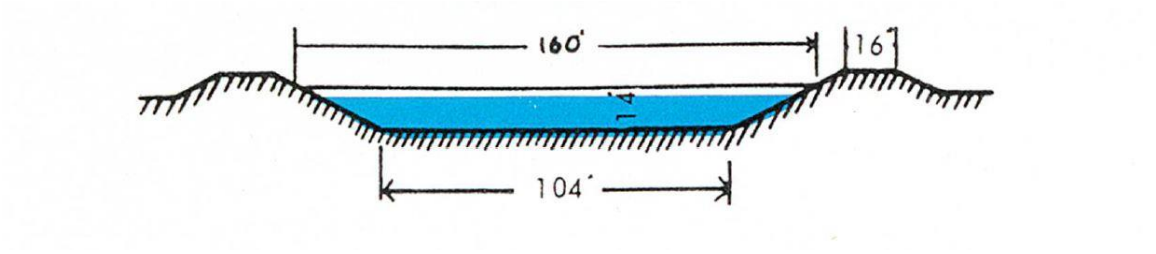

Figure 2.3-1: Earthen Embankment Canal Section: Erie Canal – Waterford to Three Rivers

On the Erie Canal from Three Rivers to Tonawanda, and on the Champlain Canal, the typical canal prism and generalized embankment section is shown in **Figure *2.3-2***.

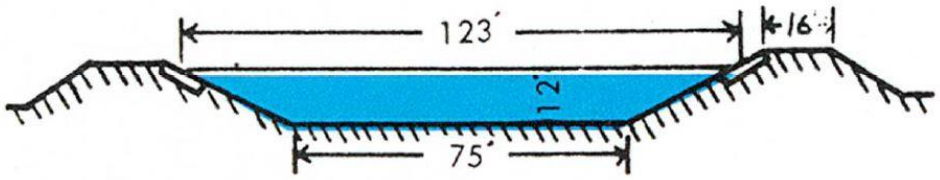

Figure 2.3-2: Earthen Embankment Canal Section: Erie Canal: Three Rivers to Tonawanda and Champlain Canal

The typical inboard slope of the canal prism as shown on **Figure *2.3-1*** and **Figure *2.3-2*** are 2H:1V. The outboard slopes may be variable. There are locations where the embankment is much wider than 16 feet due to material disposal requirements during construction.

Due to the extremely high capital cost to provide a continuous membrane, the miles of embankment that could be repaired each season under this alternative would be significantly limited, and the duration of time between the beginning and end of implementation of this alternative would expose the adjacent property owners of the unimproved segments to an unsafe condition for an extensive period of time. Thus, although this alternative could be used in discrete locations where other alternatives were found to be infeasible, it is not considered to be a practicable alternative that could be applied to all embankments.

2.3.3 Install Continuous Cutoff Walls Along Embankment Crests ~~on Both Sides of Canals and Feeders~~

A continuous seepage barrier could be provided by installing a continuous cutoff wall along the crest of the embankments ~~on both sides of the canal or feeder~~ to lower the phreatic surface within the embankment and reduce or eliminate concerns with seepage and piping failures. Lowering the phreatic surface also improves the stability of the outboard slope of the embankments, thereby reducing the risks of embankment failure. There are several available cutoff wall options including steel sheet piling, cement bentonite slurry, and deep soil mixing.

This alternative would require no substrate preparation in the bed of the canal or feeder and would yield no reduction in the cross-sectional area of the canal or feeder. The addition of a continuous seepage barrier would have the benefit of eliminating the need for some of the vegetation removal, animal burrow filling, and seepage type repairs that would be required under the proposed action. The installation of cutoff walls would result in some temporary impacts to vegetation due to the need to provide sufficient space/room for the equipment and lay down areas. The removal of dead, diseased, or imminently dangerous trees would still be required to ensure safety of persons and property.

This alternative would require extensive geotechnical investigations and analyses to determine the required depth of cutoff walls, to detail how the cutoff walls would abut existing structures, and to determine solutions for utilities that cross under the canal or feeder or that are contained within the embankment. In some instances, the installation of a cutoff wall could sever tree roots and adversely affect tree health. The construction-related temporary impacts of this alternative would include ground disturbance, construction noise, and off-site detours of the recreation trail. Since this alternative would not totally eliminate seepage through the embankment, it is likely to have minimal adverse long term environment effects from changing the phreatic surface outside the cutoff walls. Changes to the types of vegetation that will be supported on the slopes of the embankments would be minimal. This alternative is unlikely to adversely affect adjacent wetlands and waterbodies since seepage from the embankments would still exist; however, the cutoff walls provide a longer seepage path thereby making the embankment safer but not eliminating seepage. Except for the construction-related temporary impacts of this alternative, including construction noise, trimming of overhanging canopy

vegetation, and temporary off-site detours of the recreation trail, there would be negligible long term adverse environmental impacts. The work could be performed over the non-navigation season when the embankment segments are drained, and possibly during the navigation season in some locations.

Based on supplier/installer costs, the approximate total installed price for a sheetpile wall is between $~~10~~ 5M and $~~17~~ 8.5M per mile for a continuous sheet pile cutoff wall ~~on both sides of the canal or feeder~~. The lower end of this range is based on 25-foot-deep sheeting and no predrilling to address obstructions. The upper end of this range is for 50-foot-deep sheeting and predrilling due to obstructions. The system-wide cost to install continuous sheet pile wall on ~~both sides of~~ the ~~120~~ 130 miles of canal and feeder embankments that have already been identified to date would range between $~~1.3~~ 650M~~B~~ and $~~2.0~~ 1.1B.

Based on supplier/installer costs, the approximate total installed price for a cement-bentonite cutoff wall is between $~~5~~ 2.5M and $~~12~~ 6M per mile ~~for both sides of the canal or feeder~~. The lower end of this range is based on a 25-foot-deep wall. The upper end of this range is based on a 50-foot-deep wall. The system-wide cost to install continuous cement-bentonite cutoff wall on ~~both sides of~~ the ~~120~~ 130 miles of canal and feeder embankments that have already been identified to date would range between $~~0.6~~ 325Mand $~~1.4B~~ 780M.

Based on supplier/installer costs, the approximate total installed price for a deep soil mix cutoff wall is between $~~7~~ 3.5M and $~~14~~ 7M per mile ~~for both sides of the canal or feeder~~. The lower end of this range is based on a 25-foot deep-wall. The upper end of this range is based on a 50-foot-deep wall. The system-wide cost to install continuous deep soil mix cutoff wall on ~~both sides of~~ the ~~120~~ 130 miles of canal and feeder embankments that have already been identified to date would range between $~~0.8B~~ 455M and $~~1.6B~~ 910M.

Due to the high capital costs described above to provide continuous cutoff walls along ~~both sides of~~ embankment sections, the miles of canal and feeder embankments that could be repaired each season under this alternative would be significantly limited, and the duration of time between the beginning and end of implementation of this alternative would expose the adjacent property owners to an unsafe condition for an extended period of time. Thus, although this alternative could be used in discrete locations where other alternatives were found to be infeasible, it is not considered to be a practicable alternative that could be applied on a systemwide basis to all of the embankments.

2.3.4 Clear Cutting of Embankment Trees and Vegetation

The clear cutting of embankment trees and vegetation would return the canal embankments to the vegetated condition that existed soon after 1918. All trees and shrubby vegetation along embankments within the NYSCC right-of-way would be removed and turf would be established. Excavations to remove root balls of trees larger than 4 in. diameter at breast height (dbh) trees would be backfilled with impervious backfill material. Other repairs to the embankment,

including filling of animal burrows, provision of riprap between the banks of the canal, and embankment filter drains would be provided. This alternative could be progressed on the basis of the prioritization of embankment repairs, based on condition, safety and risk.

This alternative would allow the NYSCC to meet its statutory requirement to maintain the canal system in good condition as required by the Canal Law. Once the initial clearing was performed this alternative could allow a long-term strategy for managing and maintaining embankment integrity.

Implementation of clear cutting of embankment trees and vegetation alternative would not consider the thresholds presented in **Table *1.3-1*** as part of its program. However, most of the thresholds on **Table *1.3-1*** also include regulatory protection at various levels. For example, Federal or State rare, threatened, or endangered plant species located on NYSCC property or on adjacent lands that would be disturbed by clearcutting activities may be protected under the Federal Endangered Species Act or by 6 NYCRR Part 182. Even with regulatory protections, this alternative would cause adverse effects on aesthetic resources as visible from designated scenic or aesthetic resources, obstruction or elimination of scenic views, visible changes to the Canal System from publicly accessible vantage points during routine travel or recreational/tourism activities, and diminishment of public enjoyment and appreciation of the aesthetic resources. It would not consider the consistency of the proposed action with community plans or community character.

The clear cutting of embankment trees and vegetation would also not include the potential for monitoring the stability and seepage conditions of embankment sections over a period of time to better assess the risk of embankment failure and develop a more targeted plan to address long term embankment integrity and maintenance.

So, while clear cutting of embankment trees and vegetation allow the NYSCC to meet its statutory requirement to maintain the canal system in good condition as required by the Canal Law, other regulatory requirements preclude the wholesale clearcutting in some areas, and the potential long term adverse effects on resources such as aesthetics, community plans and community character could be significant. Thus, this alternative is not a practicable alternative.

3 ENVIRONMENTAL SETTING AND POTENTIAL IMPACTS

3.1 Introduction

This chapter discusses the environmental setting for the earthen embankments and the potential for environmental impacts resulting from the EEIP described in Chapter 1 and in the *Guide Book* (Appendix A). This section also discusses the potential for environmental impacts from the two alternatives described in Chapter 2. The chapter is organized by the 15 topics identified in the Final Scoping Document. It should be noted that there are numerous environmental subjects relevant to multiple topics, which are discussed in detail in the topic-specific chapter subsections. Examples of this include:

Environmental Subject	Sections Addressing Environmental Subject
Vegetation Removal	3.2 Land 3.7 Ecology (Plants and Animals) 3.9 Aesthetic Resources
Pesticides (includes herbicides)	3.3 Geologic Feature and National Natural Landmarks 3.4 Surface Waters and Wetlands 3.5 Groundwater 3.7 Ecology (Plants and Animals) 3.8 Agricultural Resources 3.14 Human Health
Erosion	3.2 Land 3.4 Surface Waters and Wetlands
Groundwater	3.2 Land 3.5 Groundwater
Federal and State Heritage Areas	3.9 Aesthetic Resources 3.10 Historic and Archaeological Resources 3.11 Open Space and Recreation Resources 3.16 Community Character

There are specific locations in the project area where "Critical Environmental Areas" (CEAs) have been designated by local or state agencies in accordance with 6 NYCRR 617.14. This designation may be with one or more of the following (6 NYCRR 617.14(g):

- a benefit or threat to human health;
- a natural setting (e.g., fish and wildlife habitat, forest and vegetation, open space and areas of important aesthetic or scenic quality);
- agricultural, social, cultural, historic, archaeological, recreational, or educational values; or
- an inherent ecological, geological or hydrological sensitivity to change that may be adversely affected by any change.

Where there is a potential for impact to a CEA in the project area, it is covered under one or more of the topics in this chapter. The process for screening and review of specific CEAs is discussed in Section 1.3.4.

The discussion in this chapter may utilize site-specific examples; however, the action being discussed in this Final ~~Draft~~ Generic Environmental Impact Statement (~~DGEIS~~ FGEIS) are procedures described in Chapter 1 and in the *Guide Book* provided in Appendix A, which set forth a programmatic approach/plan for EEIP activities across the entire New York State Canal System. The SEQR Handbook and the SEQR regulations (6 NYCRR Part 617.10) note that a Generic EIS process is appropriate when a proposed program or plan has wide application, such as in this case.[12] As the EEIP activities are implemented for any specific location, the specific activities will be planned in accordance with the *Guide Book*. This planning includes a review of the area being proposed for maintenance for environmental resources and the anticipated specific impacts of each. In limited situations in which the planned activities do not fall within the parameters of the EEIP activities presented in this document (including the *Guide Book*), such as implementing an alternative engineering solution give unique aspects of a specific site, then that activity would be subject to a separate review under State Environmental Quality Review (SEQR).

In reviewing the potential for environmental impact, the discussion includes direct (primary), indirect (secondary) and cumulative impacts of the EEIP activities. *The SEQR Handbook* describes a direct impact as one that occurs at the same place and time as the proposed action and that is likely to occur as an immediate result of the action.[13]

The SEQR Handbook defines an indirect (or secondary) impact as one which is reasonably foreseeable, occurs later or at a greater distance, and is likely the result of the action.[14] One example of indirect impacts is where the action induces growth and development, which in turn causes impacts. One example of induced growth cited in the *SEQR Handbook* is where the construction of a new interchange on a limited access highway may cause the construction of fast-food establishments, motels, and gasoline stations catering to highway travelers.[15] The purpose of the EEIP program is to maintain the integrity of earthen embankments, and not to expand the canal's real property rights or ~~promote greater~~ increase/expand use of the canal. Therefore, induced effects are not reasonably anticipated and are not discussed in this ~~D~~GEIS. Another example of indirect impacts is where the introduction of pollutants into a stream in one location may cause degradation of aquatic habitat in a downstream location.

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12 NYSDEC, *SEQR Handbook*, 97.
13 NYSDEC, *SEQR Handbook*, 79.
14 NYSDEC, *SEQR Handbook*, 79.
15 NYSDEC, *SEQR Handbook*, 84.

The SEQR Handbook states that cumulative impacts occur when multiple actions affect the same resource(s). These impacts can occur when the incremental or increased impacts of an action, or actions, are added to other past, present, and reasonably foreseeable future actions. Cumulative impacts do not have to all be associated with one sponsor or applicant.[16]

Cumulative impacts may be considered the combination of direct impacts, indirect impacts and impacts of other past, present and reasonably anticipated future actions. Cumulative impacts can result from two or more individually minor but collectively significant actions taking place over time. In general, EEIP activities will be conducted in segmental pieces over time and over a large geographic area. However, the pieces to be accomplished will not generally be in a geographic sequence, as the priority for conducting EEIP activities will be determined by a hazard classification, condition rating and risk urgency assessment as described in the *Guide Book*. Based on this, repetition of the same action sequentially in time and sequentially in distance will not generally occur for the EEIP program. In some circumstances, there is potential for different segments to impact the same surface water/wetland resources. The cumulative impact would then be the sum of all of the impacts to that resource from the various segments. EEIP activities accomplished at various times in the future on the same resources would also add together to arrive at the cumulative impacts. This combination of impacts from EEIP activities over time and distance would diminish the significance of the combined impacts.

Cumulative impacts (impacts on the same resource) from reasonably anticipated actions of others besides the NYSCC must be considered. For example, an adjacent parcel developed for residential structures might impact the same stream that might be impacted by EEIP activities. At the time of this writing, there are no known plans by others that would cause cumulative impacts on the resources studied in this document. Future developers will be able to examine the *Guide Book*, and address cumulative impacts to that resource in common.

3.2 Land

EEIP maintenance activities that affect land may include the following:

- Excavation and grading for embankment repairs
- Placement of riprap on inboard embankment slope for erosion protection
- Flattening existing embankment slopes to improve stability
- Earthwork that is incidental to the removal of trees and stumps, and backfilling voids in the embankment
- Construction of drainage blankets and toe drains to remove seepage from embankments
- Removal of trees and reestablishment of turf grass, pollinators, or vegetative screening plantings (i.e., compatible vegetation)

[16] NYSDEC, *SEQR Handbook*, 80.

Impacts on land may involve land-altering or construction activities in locations where the depth to water table is less than 3 feet. Groundwater outside the embankment limits is discussed in Section 3.5. Impacts to land may also occur when working on slopes greater than 15% grade. The implementation of EEIP activities will result in excavation and removal of natural material, including vegetation and soils. EEIP activities may result in a change in ground cover, due to replacement of trees with turf or pollinators or construction of a drainage blanket at a previously vegetated location. During any ground disturbance, the potential for erosion resulting from EEIP activities is a significant area of concern in the development and implementation of this programmatic approach.

3.2.1 Environmental Setting

Earthen embankments may be found throughout the canal system where the canal does not flow through a riverine or lake section, as well as in remnant canals and feeders. From Waterford to Three Rivers (where the Oswego, Seneca and Oneida Rivers join), the typical canal prism has a 14-foot depth, 104-foot bottom width, 160-foot top width, and 16-foot embankment crest width. From Three Rivers to Tonawanda, and on the Champlain Canal, the typical canal prism has a 12-foot depth, 75-foot bottom width, 123-foot top width, and 16-foot embankment crest width. The typical inboard slope of the canal prism is 2H:1V (2 Horizontal to 1 Vertical). The outboard slopes may be variable but are typically 1.5H:1V. There are locations where the embankment is much wider than 16 feet due to material disposal requirements during construction.[17]

When canal and feeder embankments were originally constructed, the outboard slope was typically turf covered and the inboard slope had a stone riprap lining (wash wall) for erosion protection. Over the course of about 100 years, many embankment outboard slopes have become tree-covered, with root systems that create seepage paths, are subjected to blowdown, create habitat for burrowing animals, and impair their regular inspection.

It is critical to understand the importance of maintaining the canal and feeder embankments free from trees and other large, woody plants. National guidance documents advise against allowing tree growth on embankment dams. The Federal Emergency Management Association's *Technical Manual for Dam Owners: Impact of Plants on Earthen Dams* is an accepted document used by dam owners and state dam safety agencies. It states that trees and woody vegetation have no place on embankment dams, for three reasons:

- Trees and dense vegetation hinder effective dam inspections
- Tree roots can cause serious structural instability or hydraulic problems, which could lead to dam failure and possible loss of life

[17] "New York's Canals & Connecting Waterways" Published by New York State Department of Transportation. Circa 1992

- Trees and woody plants attract burrowing animals, which can in turn cause serious structural or hydraulic problems[18]

The U.S. Bureau of Reclamation manages some 8,000 miles of canals in the Western states, along with numerous dams. Its guidance in *Canal Operation and Maintenance: Vegetation* addresses the same canal and feeder embankment hazards caused by vegetation.[19]

All dams, including canal and feeder embankments, must be inspected for seepage, cracking, sinkholes, slumping, settlement, deflection, and other signs of stress in periodic safety inspections. Vegetation is a major hindrance for dam inspections.

See **Figure *3.2-1*** for historic photos of canal embankments when recently constructed, circa 1910. Note the absence of tree cover along the embankments.

Figure 3.2-1: Historical Photos of Canal at Allen's Bridge and Eagle Harbor Bridge

Work covered under the EEIP would be performed on earthen embankments on lands under jurisdiction of the NYSCC or on lands where the NYSCC has easements or agreements with public or private entities that allows the work of the project to be carried out. In order to accommodate the potential for temporary access by means of temporary easements or a Site Access/Vegetation Management Permit, an additional 100 feet beyond property under jurisdiction of the NYSCC is included as part of the project area.

The EEIP would require thorough, regular, and systematic inspections of canal and feeder embankments, followed by identification, prioritization and implementation of EEIP activities by embankment segment. Implementation would include the specific actions to address damaged

[18] Federal Emergency Management Association, *Technical Manual for Dam Owners: Impact of Plants on Earthen Dams* (FEMA Publication 534, September 2005), 2-16.

[19] US Department of the Interior, Bureau of Reclamation, *Canal Operation and Maintenance: Vegetation* (Reclamation: Managing Water in the West, November 2017), 1.

linings, inadequate drainage, installing instrumentation, repairing surfacing, protecting embankment slopes, correcting embankment geometry deficiencies, removing vegetation, filling animal burrows, and repairing seeps.

The EEIP scope includes all embankment material and impairments, along with turf, vegetation, armoring or paving that's parallel to the embankment slopes and surfaces from outside the toe of the outboard slope to the toe of the inboard embankment slope (***Figure 1.3-1***). It also includes water-level recording and management features used in regulation of water levels in the canals and feeders, and geotechnical instrumentation devices.

3.2.2 Potential Impacts of Proposed Action

Methodology

In planning the EEIP activities for each embankment segment, NYSCC would investigate engineering information, such as soil boring and piezometer records available for portions of the western embankment or obtained in connection with planning EEIP activities, that can serve as examples that show the phreatic surface (water table) at locations in the embankment. Construction projects on portions of embankments that have previously been restored may provide general information. ~~Indications of~~ s~~S~~eeps at or above the toe of existing embankments would indicate high ground water table on the adjacent lands. The NYSCC records location, flow, and repair actions for all seeps and has compiled a record that is used to prioritize embankment repairs.

For embankment excavation and grading, NYSCC would assess and address potential impacts such as the use of erosion controls during construction, using its embankment design records, and engineering references regarding proper slope of embankments, soil types, vegetation, and other engineering solutions (including drainage). As discussed in Section 8.1 of the *Guide Book,* coverage would be obtained under the NYSDEC State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity. Most EEIP activities are expected to keep existing ground contours and slopes nearly identical, except where repairs are needed to address seepage, embankment stability and other embankment conditions that compromise the integrity of embankments. Impermeable soils would be used to restore embankments and to fill stump holes.

To help standardize certain EEIP activities, various Best Management Practices have been developed, which act as the NYSCC standard for in-house or contract EEIP activities. Common EEIP activities have been categorized by the type of embankment feature (vegetation, erosion, etc.) and detrimental issue (trees and brush, cracks, etc.). Each Best Management Practice has been developed to cover common repair needs that should accommodate most embankments.[20]

[20] The Best Management Practices are Attachment 1 to the *Guide Book*.

Direct Impacts

The EEIP allows consideration of a broad range of recommended actions. The potential impacts are discussed below, as organized by sub-categories: groundwater, excavation, change in vegetative cover, stormwater management and erosion and sediment control, and stormwater runoff.

Groundwater: The water level in the canal is raised and lowered every year at the beginning and end of each navigation season. These seasonal fluctuations in water level would not be changed for EEIP activities. In general, work to repair the inboard and outboard canal slopes would be scheduled for the winter season when the canal is drained. On occasion, work may be required on the canal inboard embankment slope during navigation season, which could involve dewatering of the work area. This is expected to be a rare occurrence. Since the canal and feeder embankments would be monitored in a systematic way under the EEIP, the likelihood of emergency repairs that require dewatering the canal during navigation season is less than under the Ad Hoc repair alternative (See Sections 2.2 and 3.2.3).

In the event embankment repairs under the EEIP are needed, the NYSCC would review information on groundwater levels, including locations where depth to water table is less than 3 feet, indications of seeps at or above the toe of embankments, soil borings and piezometer records, and data from current or completed nearby embankment projects.

As an example, in 2019, Bergmann and McMahon & Mann Engineers conducted subsurface explorations and obtained water level measurements at six embankment locations in the Spencerport area where seeps have been noted. Piezometers were installed at several embankment crest locations and two outboard toe of embankment locations. Findings included the following:

- The elevation of the water level in the crest piezometers varies, but the seasonal increase varies between 2 and 3 feet as the canal is filled (approximately a 12-foot water level increase).
- Piezometers installed at the outboard toe and in the underlying bedrock showed less than 3 feet of rise in response to canal filling.
- Water levels in the embankment with the canal full are lower than expected for a homogeneous embankment, and in most cases are at near the top elevation of the 1800s embankment buried underneath.
- Because the water levels at the embankment crest are low, the seepage gradients are generally low. Where significant seeps are visible, blanket drains, flattening the slopes, and protecting the seeps with a graded filter are all recommended options to address seepage.

This example illustrates the potential involvement of EEIP activities with water table elevations in and immediately adjacent to embankments. Implementation of the EEIP would likely have minimal adverse effects on water table elevations outside the toe of embankment slope, which is largely controlled by local streams, water bodies, and the surrounding groundwater conditions, as well as the seasonal raising and lowering of the canal. If anything, EEIP activities may be beneficial to water table elevations outside the toe of the embankments as leaks creating ponded or pooled water are corrected. The effects on groundwater outside the canal right of way are discussed in Section 3.5.

Construction of drainage blankets and toe drains may cause localized lowering of the groundwater table within the embankment as seepage is collected and conveyed away from the embankment. This is necessary to maintain safety and stability of the embankment. Data referenced above indicates that the annual filling of the canal (12-foot increase in water surface elevation) causes a groundwater increase of 2 to 3 feet within the embankment. Therefore, the effects of constructing blankets and toe drains s are expected to be minimal and localized, representing a restoration of original design conditions. Changes are expected to be insignificant beyond the toe of embankment.

Excavation: Implementation of EEIP activities will result in excavation and removal of natural material, including vegetation and soils. This potential impact was identified because of the cumulative amount of material expected to be excavated over time and across the Canal System under implementation of the EEIP. It is possible that EEIP actions will exceed 1,000 tons of natural material in an individual project area; however, the EEIP will provide for steps to mitigate impacts of excavation of natural material (see Section 3.2.4 below).

Most EEIP activities are expected to keep existing ground contours and slopes nearly identical, except where repairs are needed to address seepage, embankment instability and other embankment conditions that compromise the integrity of the embankments. Those repairs could include embankment widening and smoothing or widening of embankment slopes. Impermeable soils would be used to restore embankments and to fill root ball holes. Impacts to land may also occur when working on slopes greater than 15% grade. As EEIP activities will occur on or around such slopes, NYSCC will assess and address potential impacts using its embankment design records, and engineering references regarding proper slope of embankments, soil types, vegetation, and other engineering solutions (including drainage).

Implementation of the EEIP would likely generate a few types of natural materials: vegetation above the ground surface (trees, shrubs, grasses, etc.), woody material below the ground surface (stumps and roots) and soils that are not reusable on site. Management of these natural materials would be in accordance with applicable regulations.

Change in Vegetation Cover: The principal EEIP activity to affect vegetation would be removal of trees and brush, and replacement with turf grass. All vegetation should be removed in Zones 1,

2A, 4 and 5 of the embankment, under ideal conditions extending to a distance of H/2, where H is the embankment height from the toe to the crest, but not less than 15 feet beyond the toe of the embankment. Absent emergencies, vegetation removal would only occur on non-NYSCC owned property pursuant to written authorization of the property owner. The embankment zones are shown in **Figure *3.2-2*** below.

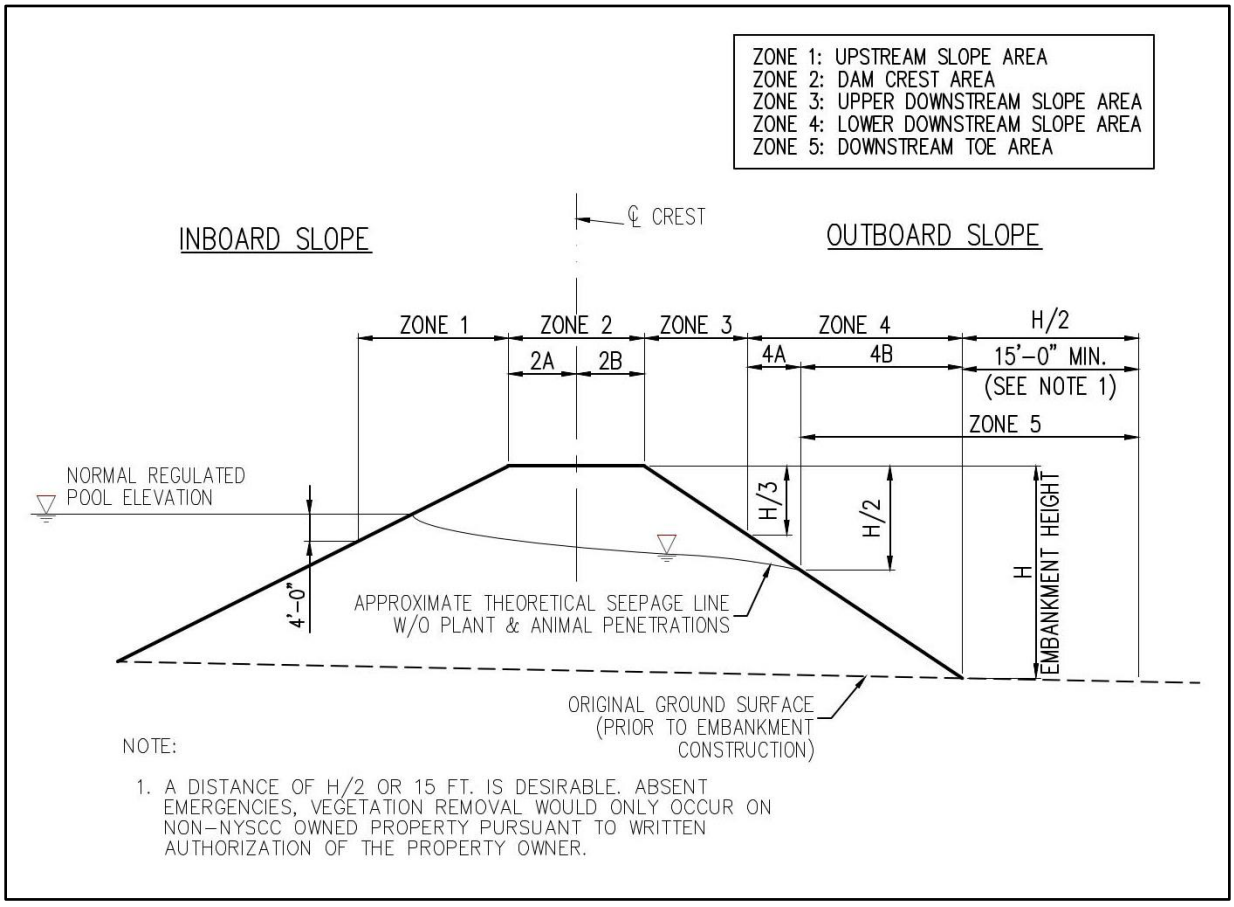

Figure 3.2-2: Embankment Zones for Vegetation Management

For trees and brush less than 3 inches diameter at breast height (DBH) that are impeding embankment inspection, trunks would be cut flush with the ground. The area would be marked on inspection reports for future monitoring. For trees greater than 3 inches DBH, the roots would be removed to avoid hazards caused by seepage through the root system. The EEIP requires a detailed removal plan for trees larger than 3 inches DBH to include:

- A sketch or plan indicating the location of the tree(s) to be removed
- Documentation of compliance with the Endangered Species Act, as Northern Long-eared Bat and Indiana Bat are known to exist in many locations in New York State

- For work sites within the New York State Department of Environmental Conservation (NYSDEC)-designated Emerald Ash Borer (EAB) Restricted Zone, the requirement that the contractor certify compliance with the NYSDEC regulations regarding EAB[21]
- Excavation that allows for removal of all roots greater than 1 inch in diameter
- Backfilling the hole with suitable approved embankment material to 95% compaction per ASTM D-698

Disturbed and excavated areas would generally have turf established under the EEIP. Establishment of turf areas would include fertilizing, watering, and protecting with mulch. Once established, turf areas would be mowed at least twice per year to prevent growth of brush or woody vegetation. Properly maintained vegetation would help reduce erosion of embankment slopes, stabilize ditches, and help to reduce the influx of invasive species and unwanted vegetation. In areas where construction, overuse, or normal wear and tear has caused the normal ground cover to be disturbed, turf seeding would be conducted to promote regrowth. For all slopes 3H:1V or steeper, vegetated channels, streambanks, shorelines and areas where wind prevents standard mulch application, the area would be further stabilized with stabilization matting. Stabilization matting for embankment slopes would use semi-permanent products made entirely of organic materials.

Supplemental plantings may be used in limited areas on Zones 2B and 3 of the embankment (upper third of outboard slope). In the Embankment Best Management Practices, both Vegetative Screen Plantings and Pollinator Plantings are considered compatible vegetation.

Vegetative Screen Plantings consist of small, non-woody vegetation that may be planted on the canal or feeder embankment in addition to normal turf covering. Plants would be non-woody, have shallow root systems and a maximum mature height of 12 feet. Areas with supplemental plantings would require maintenance on a regular basis to keep the vegetation in check and not allow for excessive growth.

Pollinator plantings are an acceptable substitute for turf grass in certain applications. Pollinator plantings are used only on Zones 2B and 3 of the embankment (upper third of outboard slope). They are non-woody, provide resistance to erosion and provide food and shelter for pollinators. Pollinator plantings must be mowed once per year.

For heavily vegetated embankments near populated or heavily used municipal areas, a system to review tree removal on other areas such as visual and aesthetic resources is discussed in Section 3.9.

[21] Guidelines for moving Ash that is not firewood: Emerald Ash Borer Recommendations and Resources - NYS Dept. of Environmental Conservation

Drainage blankets are a common method for control of seepage through an embankment by collecting seepage in a granular filter from the outboard slope and conveying it downslope to a toe drain. Blanket drains are typically constructed with a sand layer adjacent to the embankment to serve as a filter to retain soil particles. The drainage blanket may be covered either with soil and turf or with gravel fill. Drainage blankets may typically extend approximately halfway up the outboard embankment slope from the toe. The drainage blanket may be combined with a berm to flatten the outboard slope to improve embankment stability. In that case the berm usually extends the full height of the embankment and is turf-covered.

Toe drains are normally used with drainage blankets by creating a positive drainage path for seepage. They may include a perforated pipe system, a rock filter system, or other form of stable void space at the toe of the embankment. The condition and quantity of the water exiting the toe drain can be observed by use of a V-notch weir or weir box. They would be monitored to verify their proper function and that stable conditions exist within the embankment.

A land cover analysis was performed on the identified 130 miles of embankment in Section 3.7.2 for use as it relates to habitat types. It shows an estimate of the upper limit to the amount of brush and forest cover types that would be converted into cover types allowed in the EEIP. This analysis indicates that up to 1,257.2 acres of embankment cover may be converted from brush and cover to a mixture of turf grass, vegetative screening plantings and pollinators, with occasional trees/woody vegetation in Zones 2B or tree/woody vegetation remaining at specific projects where regulatory, or community threshold are exceeded. The 1,257.2 acres would be an average of 1.6 acres per mile of embankment or an average of 0.041 percent of the forest and land cover in their counties.

Stormwater Management and Erosion and Sediment Control: There are two issues involved with stormwater runoff for ground disturbance from EEIP activities. First, there is the potential to cause erosion during construction until vegetative ground cover has been established. Second, upon completion of construction, there is the potential for changes in stormwater peak flow, volume or quality compared to prior conditions. The following paragraphs discuss the regulatory background.

For stormwater runoff, it is important to understand the distinction between point-source pollution (generally wastewater discharged from the pipes from industrial facilities and municipal sewage treatment plants into waterbodies) and non-point source pollution (which enters waterbodies from a widespread area that is not as clearly defined). Rather than coming from the end of a pipe, non-point source pollution comes from stormwater runoff (rain or snowmelt) from various surfaces such as parking lots, streets, farmland, and residential yards. It can contain oils, spilled chemicals, pesticides, fertilizers, sewage, or litter. When water flows through a watershed it can carry any pollution that it picks up along the way.

A federal regulation, commonly known as Stormwater Phase II, requires permits for stormwater discharges from Municipal Separate Storm Sewer Systems (MS4s) in urbanized areas (population of 1,000 per square mile or more). The NYSCC is a non-traditional MS4 and has had coverage under the MS4 permit since 2003. Permittees are required to develop a Stormwater Management Program (SWMP) and submit annual reports to the NYSDEC. Under this permit, NYSCC is implementing a five-year, system-wide stormwater management program that includes public education and outreach, public participation, detection and elimination of all illicit discharges, construction site runoff control, post-construction runoff control, and pollution prevention.

The NYSCC MS4 Stormwater Management Work Plan is a resource to aid in evaluating the effects of EEIP activities. Some municipalities along the canal and feeder embankment route also have MS4 Plans, and the NYSCC would coordinate the review of EEIP activities with those plans, if there is the potential for changes in stormwater runoff to affect sites beyond the NYSCC right-of-way. Areas where municipalities with MS4 Plans are adjacent to the canal and feeder embankment sections may include those in the Buffalo, Rochester, Syracuse, Utica, Albany and Glens Falls metropolitan areas.

Besides the MS4 permit, any construction activities disturbing one or more acres of soil must be authorized under the NYSDEC State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity (currently Permit No. GP-0-20-001). Permittees are required to develop a Stormwater Pollution Prevention Plan (SWPPP) to prevent discharges of construction-related pollutants to surface waters.

The following EEIP activities have the potential to cause erosion during construction and are to be managed in accordance with erosion and sediment control regulations and guidelines:

- tree clearing and vegetation management,
- drainage blanket and toe drains,
- slope flattening for embankment stability,
- upstream slope protection (inboard side),
- repair of localized embankment damage including gullies, sinkholes, embankment cracks, rutting and rodent burrows.

During the course of any ground disturbance, the potential for erosion resulting from EEIP activities is an area of concern, and NYSCC would consider information in its assessment of impacts as mentioned above, as well as references such as the *New York State Stormwater Management Design Manual*.[22] The *Manual* provides designers with a general overview on how

[22] New York State Department of Environmental Conservation, *New York State Stormwater Management Design Manual* (January 2015).

to size, design, select, and locate stormwater management practices at a development site to comply with state stormwater performance standards.

For the construction phase, the *New York State Standards and Specifications for Erosion and Sediment Control*,[23] widely known as the *Blue Book*, is the guideline document. The *Blue Book* provides standards and specifications for the selection, design and implementation of erosion and sediment control practices for the development of Erosion and Sediment Control Plans for the SWPPP, which is needed for coverage under the NYSDEC State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity.

The typical outboard embankment slopes are 1.5H:1V based on record plans. Embankment slopes maintained or repaired under EEIP activities would be the same slope or flatter. Outboard slopes may be flattened to 3H:1V if engineering investigation determines that is warranted for seepage control or stability. Inboard embankment slope and lining restoration would be done to restore the original canal prism shape and would not be flattened.

Where required, repair of the canal prism to original shape and size has potential for impacts due to erosion and sedimentation. Repairs of the outboard embankment in steep sections would often have a "feathered" gradient between the new slope layback and the existing slopes at the top of embankment (generally corresponding to Zone 3 in **Figure *3.2-2***). All backfill would be properly placed and compacted.

Removal of established vegetation also presents potential for erosive paths through the embankment. Removal of trees greater than 3 inches DBH would leave root ball voids, which can create ideal conditions not only for soil erosion and sedimentation, but also for piping failure of the embankment. For that reason, stump removal would be done in the winter season when the canal has been drained. All voids from stump and root removal would be backfilled and compacted. The sides of the cavity would be excavated no steeper than 1H:1V and the bottom of the cavity would be approximately horizontal, with all loose soil removed. The excavation would be backfilled with well-compacted soil placed in maximum loose lifts of 8 inches.

To assess the potential effects of EEIP activities on the volume and peak flow from stormwater runoff, calculations were performed in accordance with the *New York State Stormwater Management Design Manual* to determine the likely change (if any) from embankment work for EEIP activities. Likely modifications of ground cover that may have an effect on runoff include the following:

[23] New York State Department of Environmental Conservation, *New York State Standards and Specifications for Erosion and Sediment Control (Blue Book)* (2016).

- Removal of tree cover and replacement with turf along the full height of outboard slope
- Removal of tree cover and replacement with a drainage blanket on the bottom portion of the embankment, consisting of coarse aggregate top over a sand or fine stone filter layer. The rest of the outboard embankment would be turf. For estimating purposes, it is assumed that the finished ground cover would be 50% turf and 50% exposed drainage blanket.
- Removal of tree cover and replacement with vegetative screen plantings consisting of non-woody vegetation with shallow root systems and a maximum height of 12 feet

Any of these modifications could be implemented on the existing outboard embankment slope, which is generally 1.5H:1V. Note that replacement of tree cover with turf represents a restoration of original turf conditions when the canal and feeder embankments were constructed between 1910 and 1920. The EEIP activities include no new or increased areas of pavement or impermeable surfaces.

In some locations, the outboard embankment slope may be flattened to a slope of 3H:1V in order to improve bank stability and address seepage in the embankment. This work may also include the drainage blanket of coarse aggregate on granular filter material. Likely modifications to ground cover with slope flattening include:

- 100% turf cover
- 50% turf cover and 50% drainage blanket

To assess the effects of ground cover modification due to EEIP activities, the amount of stormwater runoff was calculated for a 1-acre area of outboard embankment slope with different ground covers. The calculations were performed for the 10-year peak flow, as well as runoff volume for soils in Hydrologic Group C. The Soil Conservation Service (SCS) method was used in accordance with the *New York State Stormwater Management Design Manual*. The results are shown in **Table *3.2-1***below. The first four entries represent both existing and proposed ground cover treatments for the existing 1.5H:1V outboard embankment slope. The last two entries are for proposed ground cover in conjunction with flattening the outboard embankment slope to 3H:1V.

Since the canal and feeder embankments were originally turf-covered, the stormwater and drainage facilities were designed for those conditions, using the engineering standards of that time. To assess potential changes in runoff due to EEIP activities, it is useful to compare original conditions consisting of a turf-covered embankment at 1.5H:1V slope, with restoration to a combined turf and drainage blanket ground cover that maintains the original 1.5H: 1V embankment slope. For any comparison of embankment conditions, the future runoff condition after implementation of the EEIP will never be greater than the original embankment surface conditions.

In this situation, peak flow would change from 0.43 cubic feet per second (cfs) to 1.16 cfs, for an increase of 0.73 cfs per acre. For a 20-foot-high embankment section, each linear foot includes approximately 40 square feet of area. An acre of outboard canal and feeder embankment is therefore greater than 1,000 feet in length. For this change in ground cover, the increase in peak runoff would be 0.73 cfs/1,000 feet or 0.00073 cfs (0.3 gallons/minute) per foot length of embankment. Runoff volume for this change would increase by 0.035 acre-feet (1525 cubic feet) per acre of embankment, as shown in **Table *3.2-1***. A typical blanket drain would have an 8-inch-thick surface of fine stone fill, with a porosity of 40%. This equates to a pore volume of over 5,000 cubic feet per acre of embankment. In other words, the increase in runoff volume would be significantly less than the actual pore volume of the blanket drain. Blanket drains may be covered with topsoil and turf as well as vegetative screen plantings; where appropriate, they may also be used as ground cover, further reducing peak runoff and volume. In summary, there would be no significant increase in peak runoff flow or volume beyond the embankment limits due to construction of turf and blanket drain embankment ground cover.

As previously noted, EEIP activities would not include any increase in impermeable areas on the embankments. Where blanket drains are installed to control seepage, they would have additional utility for stormwater management to provide some degree of infiltration, by virtue of the porosity of the blanket drain.

The EEIP activities would be designed to follow stormwater management practices that are appropriate for linear features such as the canal and feeder embankments, following the guidance of the *New York State Stormwater Management Design Manual*.

Table 3.2-1: Stormwater Data for Existing and Proposed Embankment Ground Cover

Runoff Generated per 1 Acre of Embankment Area			
Existing Outboard Embankment Slope 1.5H:1V	**SCS Curve Number (CN)**	**Peak Runoff (cfs)**	**Runoff Volume (ac-ft)**
Existing Tree Cover	55	0.12	0.018
Original (1918), Existing Turf, or Proposed Turf Vegetation	61	0.43	0.033
Proposed 50% Turf, 50% Stone Cover	71	1.16	0.068
Proposed Vegetative Screen Plantings	48	0.01	0.006
Proposed Flattened Outboard Embankment Slope 3H: 1V	**SCS Curve Number (CN)**	**Peak Runoff (cfs)**	**Runoff Volume (ac-ft)**
Proposed 50% Turf, 50% Stone Cover	71	0.87	0.068
Proposed Turf Vegetation	61	0.30	0.033

Indirect Impacts

No indirect impacts are anticipated for the EEIP activities.

Cumulative Impacts

The potential for adverse direct and indirect impacts on lands is discussed above. This GEIS considers the EEIP's implementation to the greatest extent allowed across all of the earthen embankment areas. There are no other ~~future~~ known activities planned for the earthen embankment areas by the NYSCC, nor by third parties who would need a NYSCC permit to perform a project, that would have an impact that needs to be considered herein. ~~and there are no activities on the embankments that would be allowed by others without permission and control by the NYSCC.~~ There is no ~~meaningful~~ information regarding previous impacts to the embankment areas that alter this assessment of cumulative impacts.~~, as this would be from the original construction of the embankments, and in many locations, from the construction of~~

~~previous versions of the canals~~. It is therefore concluded that the potential for cumulative impacts would be restricted to the potential for direct impacts.

Conclusion

The potential impact from this alternative would be limited to the direct impacts. All embankment repairs and vegetation management work under the EEIP would be done in full compliance with New York State regulations for excavations, stormwater management, and erosion and sediment control. There would be no increase in paved or impermeable area at the embankments for EEIP work. The Erie Canalway Trail would remain in a paved or stone dust surfacing condition depending upon its current surfacing. The impacts would also be spread out over time. There are no EEIP activities allowed where potential effects would impair the land use of New York State lands traversed by the embankment portions of the canal.

3.2.3 Potential Impact of Alternatives

Under the Null or No-Action Alternative, any earthen embankments would be ~~left to fail.~~ at greatest risk of failure compared to other alternatives. Prior to any such failure, there would be no measurable impact to land use within the canal right-of-way or at adjacent property. At such time that the embankments would fail, water contained within the canal prism would be rapidly released. The risks associated with such an event are described in Appendix B. Depending on the location of the breach, the surrounding area would be inundated to various depths depending on topography. A breach in a canal or feeder embankment having a water depth of 12 feet is estimated to occur over 1½ hours, enlarge to 150 feet wide and discharge a peak flow of between 5,000 and 10,000 cfs. The resulting flood wave would seriously impact existing land uses for the inundated terrain outside the canal limits. In addition to potential loss of life and damage to infrastructure, most of the flooded lands would be rendered unusable until restoration projects were completed. Lack of financial capability to fund restoration work could leave some areas unusable for an extended period of time.

Under the Ad-Hoc Alternative or Project-By-Project Approach, the ultimate impact to land use inside or outside of the earthen embankments would be similar to that of the proposed action. The difference would be in timing of the impacts. Under the EEIP program, the maintenance would be planned and executed proactively, while under the Ad-Hoc Alternative, the maintenance would be commenced when conditions become unsafe, increasing the potential for a breach over that of the proposed action. In addition, the ad-hoc approach has the potential for greater impacts than the EEIP actions, because emergency repairs may be necessitated as the canal and feeder embankments deteriorate. Emergency repairs may require canal shutdown during navigation season and may have a greater effect on adjacent land use and stormwater management than an efficiently planned embankment maintenance operation.

3.2.4 Mitigation

EEIP activities associated with embankment maintenance and vegetation management would be conducted in such a way to avoid, minimize and mitigate adverse effects. These practices include erosion and sediment controls during construction, restoration and stabilization of slopes following construction, and providing properly placed and compacted fill where natural material has been removed, and prompt revegetation of tree and brush removal and all excavated areas.

Where trees are removed, supplemental plantings and/or pollinator plantings may be used for vegetative mitigation on Zones 2B and 3 of the embankment (see also Section 3.7). Supplemental plantings are non-woody, with shallow root systems and a maximum mature height of 12 feet. Areas with supplemental plantings require maintenance on a regular basis to prevent excessive growth. Pollinator plantings are also non-woody and provide food and shelter for pollinators. Pollinator plantings must be mowed once per year. Such plantings would help to stabilize soils from erosion.

Refer to Section 3.9 for a discussion of assessing the effects of tree removal with respect to aesthetics and community character. Depending on the specific characteristics of the site, mitigation measures may include selective tree removal, relocation, new plantings, or alternative engineering solutions.

Soil and erosion control management best practices, as required by the NYSDEC, would be implemented for all ground-disturbing activities regardless of whether they fall under the NYSDEC SPDES General Permit for Stormwater Discharges from Construction Activity (Permit No. GP-0-20-001), which is triggered by exceeding one acre of disturbed ground. From recent embankment restoration projects, NYSCC would consider techniques or methods used to prevent erosion on slopes steeper than 33% grade during ground-disturbing activities, such as Turf Reinforcement Mats (TRM).

It is possible that EEIP actions would exceed 1,000 tons of natural material in an individual project area; however, the EEIP would provide for restoration of natural material that is more compatible with earthen embankments.

The EEIP may include recommendations for scheduling and coordination of activities to limit impacts, including volume of excavation and duration of effect; to address an activity's compliance with regulatory requirements and minimize impacts; and to maximize beneficial uses of natural materials.

NYSCC would employ best practices for embankment repair and vegetation management, including the *New York State Stormwater Management Design Manual*, which is the primary recognized source for stormwater management best practices, and the *Blue Book*.

Previous canal repair areas have been lined on the downstream side by a double row of sediment filter log or single row of silt fence, whether soil disturbance was occurring or not. The NYSCC would consider using this and other practices in the future to prevent sediment-laden water from escaping the project limits.

The vegetation removals and embankment prism alterations would be covered by individual project SWPPPs. The SWPPP would provide the framework for consistent erosion and sediment control measures across the length of the embankment segment under consideration. It will also provide a mechanism for NYSDEC to monitor and enforce sedimentation impacts created by these operations.

3.3 Geological Features and National Natural Landmarks

The initial review of features in the project area included recognized geological features and proximity to National Natural Landmarks (NNLs). Two NNLs were identified.

The National Natural Landmarks Program recognizes and encourages the conservation of sites that contain outstanding biological and geological resources. Lands under almost all forms of ownership or administration have been designated including federal, state, county, municipal, tribal, and private. Participation in the program is voluntary. The National Park Service administers the program and works cooperatively with landowners, managers and partners to promote conservation and appreciation of our nation's natural heritage. Sites are designated by the Secretary of the Interior for their condition, illustrative character, rarity, diversity, and value to science and education.

The goals are to encourage the preservation of sites illustrating the geological and ecological character of the United States, to enhance the scientific and educational value of sites thus preserved, to strengthen public appreciation of natural history, and to foster a greater concern for the conservation of the nation's natural heritage.

Some NNLs are open to the public and others are not. Participation in the NNL Program does not carry any requirements for public access. Since many NNLs are located on federal and state property, permission to visit is often unnecessary. The federal action of designation imposes no new land use restrictions that were not in effect before the designation. The designation does require federal agencies to consider these sites in their planning, just as consideration is made in the New York State Environmental Quality Review.

3.3.1 Environmental Setting

One unique geological feature was identified within 500 feet of the project area in the SEQR Part 1 FEAF. That feature, Moss Island, was also designated as a National Natural Landmark with the National Park Service in 1976. It is identified on the NYSDEC Environmental Resource Mapper as 21.7 acres. It was identified in the Part 1 of the SEQR FEAF for the City of Little Falls and the

Town of Manheim, both in Herkimer County and is located between the Mohawk River and the New York State Barge Canal.

Moss Island is part of an uplifted fault block of ancient crystalline igneous rock. It is known for its large, 40-foot-deep potholes and contains the best exposure of glacial age potholes eroded by meltwater floods in the eastern United States. The island is covered in dwarf oak and glacial striations are visible in some places. As shown on **Figure *3.3-1***, it is a popular location for rock climbers and hikers.

One end of the island is located at Lock E-17, which provides parking and access to the island via a walkway over the lock. Hikers have noted that the operation of the lock can be viewed from the island.

Figure 3.3-1: Rock Climbing on Moss Island

The other NNL identified in the SEQR Part 1 FEAF is the "Montezuma Marshes." According to the National Park Service, it includes 2,100 acres of marsh dominated by broad-leaved cattail within the Montezuma National Wildlife Refuge in Seneca County. A large section of the Main Pool, including Maple Island and Black Lake, is representative of conditions in the original marsh in which broad expanses of cattail marsh were interspersed with old river channels and ponds. Broad-leaved cattail and other tall plants appear as islands of emergent vegetation in a shallow lake. Another portion of this NNL is the Swamp Woods Natural Area, which is an unusual stand of undisturbed mature swamp woodland. Dominant tree species are red maple, swamp white oak and American elm. Some of the swamp white oaks are over 40 inches diameter at breast

height and are 80 feet tall. In the description of the Montezuma Marshes, the National Park Service describes the red maple-swamp white oak stand as one of the best examples of its kind in New York and New England.[24] This area serves as a resting and feeding area for migrating waterfowl and provides nesting habitat for many species of ducks, herons, other waterbirds, neotropical migrant songbirds, and bald eagles (*Haliaeetus leucocephalus*).

The location of the Montezuma Marshes NNL is shown on **Figure *3.3-2***. The Cayuga-Seneca Canal is located along the east side of Montezuma Marshes. The northern limits of the NNL are along the New York State Thruway. The Canalway Trail does not extend through Seneca County; however, there is a roadway shown on Google Earth labeled "Wildlife Drive" just inside the boundary of the NNL.

[24] "National Natural Landmarks," National Parks Service, accessed December 1, 2020, https://www.nps.gov/subjects/nnlandmarks/site.htm?Site=MOMA-NY .

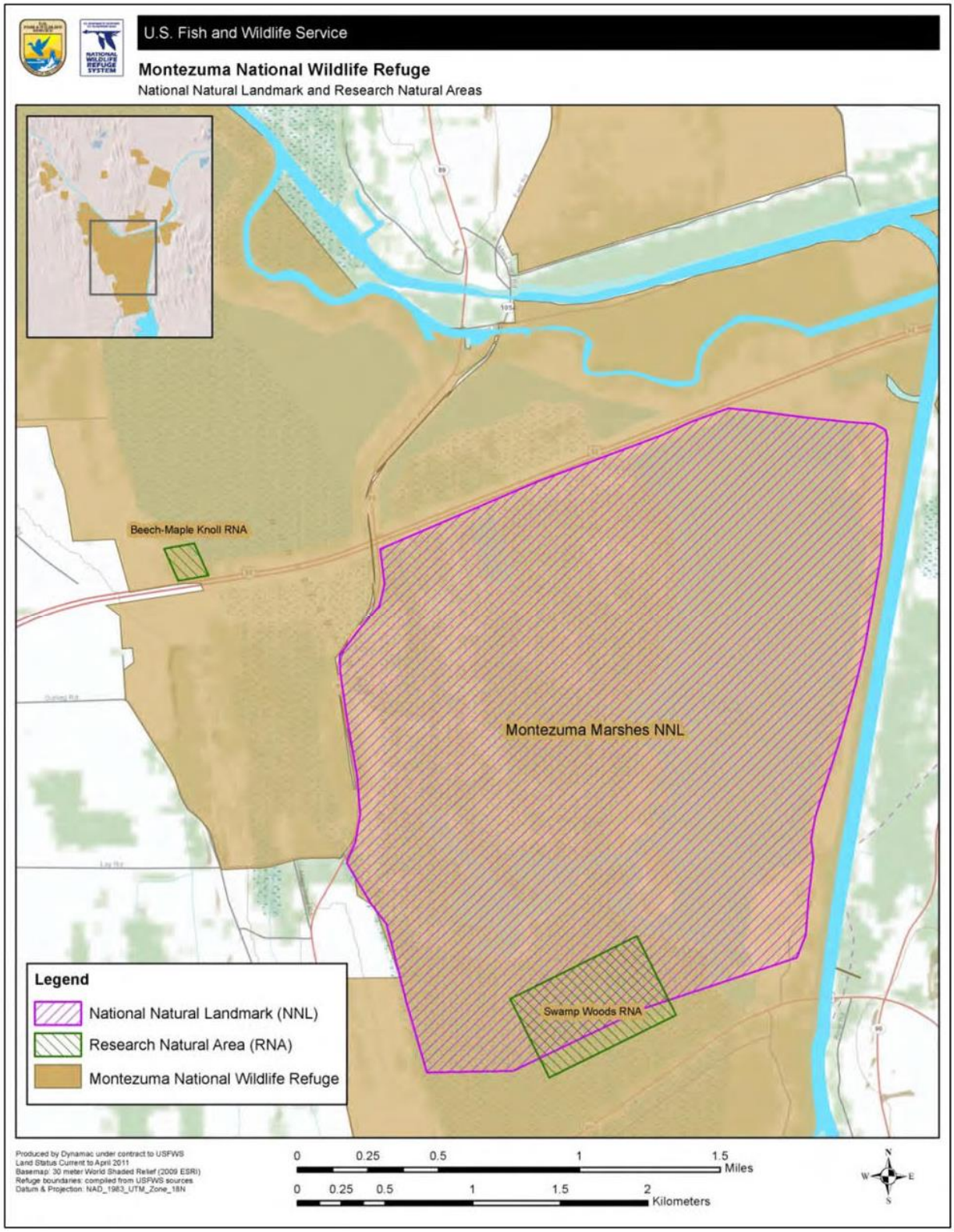

Figure 3.3-2: Montezuma Marshes National Natural Landmark.
Source: U.S. Fish & Wildlife Service.

3.3.2 Potential Impacts of Proposed Action

Moss Island does not qualify for the definition of an earthen embankment. Rather than being earthen, the feature is primarily bedrock. Rather than being lower than the water level held in the canal, Moss Island is higher than the Erie Canal and Mohawk River. This National Natural Landmark would therefore not be subject to the EEIP.

The main features of the Montezuma Marshes National Natural Landmark are the marshes, which include broad-leaved cattail and undisturbed swamp woodlands. The area along the east side of Montezuma Marshes is immediately adjacent to the Cayuga-Seneca Canal. Since the activity of the EEIP would be confined to NYSCC-administered land, there would be no direct impact on the Montezuma Marshes NNL. When the Seneca River was canalized to form the Cayuga-Seneca Canal, spoil berms were created along the banks of the Cayuga-Seneca Canal. The west bank of the Cayuga-Seneca Canal is a spoil berm and is adjacent to the Montezuma Marshes NNL. The spoil berm contains the canal and helps to maintain the required navigation draft. Based on discussions with NYSCC operations staff and observations, the spoil berm is neither heavily forested nor is it actively maintained. Under the EEIP, these embankments/ spoil berms would be actively maintained in accordance with the *Guide Book*. The EEIP activities would include inspections, maintenance/mowing of grass cover, tree removal and other activities. This would impose no direct effects on the Montezuma Marshes NNL. Should there be an area of heavily forested embankment, the section would exceed the threshold in **Table *1.3-1***, and the procedure described in Section 1.3.4 would be followed for that segment of embankment. In following this procedure, dead trees and brush, diseased and imminently dangerous trees, and trees smaller than 3 inches diameter would be removed. While this action would remove habitat for some species (see Section 3.7), it does not pose a significant threat to the Montezuma Marshes NNL for the following reasons:

- These direct impacts would occur on canal land, and not on land managed by the U.S. Fish & Wildlife Service.
- There is a refuge road that separates the canal from the NNL.
- This loss of habitat would not cause habitat fragmentation, since it is the adjacent area of the NNL that would be affected and not the habitat of the NNL itself.

Potential indirect impacts from the EEIP on the Montezuma Marshes NNL include sediment-laden runoff water from the embankment/spoil berms entering the marshes and pesticide runoff as is described in Section 3.4 and Section 3.7.

As noted in the *SEQR Handbook*, cumulative impacts occur when multiple actions affect the same resource(s).[25] These impacts can occur when the incremental or increased impacts of an

[25] NYSDEC, *SEQR Handbook*, 80.

action, or actions, are added to other past, present, and reasonably foreseeable future actions. In the case of the Montezuma NNL, past actions have occurred when the Seneca River was canalized along the eastern boundary of the NNL and when the New York State Thruway was constructed along the northern boundary. This would not have caused direct impacts, but rather indirect as described briefly above. Other actions that would cumulatively affect the Montezuma Marshes NNL include continued runoff from the Thruway to the north and the indirect impacts from future maintenance of the embankment. There is also the potential for impacts due to pipelines and other utilities that may be constructed along the New York State Thruway.

3.3.3 Potential Impact of Alternatives

Under the Null or No-Action Alternative, any earthen embankments/spoil berms along the Cayuga-Seneca Canal adjacent to the Montezuma Marshes would be ~~left to fail~~ at greatest risk of failure compared to other alternatives. Prior to any such failure, there would be no impact to the NNL. At such time that the embankment/spoil berms along the Cayuga-Seneca Canal would fail, sediment-laden water from the canal would flow into the marshes, significantly impacting the makeup of the marshes that qualifies it as an NNL.

Under the Ad-Hoc Alternative or Project-by-Project Approach, the ultimate result along the Montezuma Marshes NNL would be similar to that of the proposed action. The difference would be in timing of the impacts. Under the EEIP program, the maintenance would be planned and executed proactively, while under the Ad-Hoc Alternative, the maintenance would be commenced when conditions become unsafe, increasing the potential for a breach over that of the proposed action.

3.3.4 Mitigation

Avoidance of the Montezuma NNL is not available, as it would not be feasible to move the embankment/spoil berm away from the NNL and rerouting the canal would be beyond the scope of the proposed action. Some minimization could be realized by maintaining the steepest slope practicable. This does not mean that steep slopes would be retained at the expense of good engineering practices, and to establish stable slopes for embankment stability. Other forms of minimization that could be applied are described for Surface Waters and Wetlands (Sections 3.4.4) and in Ecology (Section 3.7.4).

After minimizing potential impacts, there could still be impacts to the Montezuma Marshes NNL as described above[26]. Any direct impact on wetland areas in the Montezuma Marshes NNL would exceed the threshold shown on **Table *1.3-1***, Regulatory and Community Thresholds. It would then follow the procedure described in Section 1.3.4.

[26] The Montezuma Marsh is also a NYSDEC regulated freshwater wetland. Construction work within the 100-foot adjacent area would require an Article 24 Freshwater Wetland permit.

3.4 Surface Waters and Wetlands

Surface waters are a valuable resource that is protected by a number of federal and state laws and regulations. Following is a brief summary of those that apply to the EEIP.

Section 10 of the Rivers and Harbors Act of 1899

Under this act, the USACE has jurisdiction over:

- the construction of any structure in or affecting any "navigable waters of the United States;"
- the excavation/dredging or deposition of material in navigable waters; and
- any obstruction or alteration in navigable waters.

The federal regulations implementing this act define navigable waters of the United States as follows:

> "Navigable waters of the United States are those waters that are subject to the ebb and flow of the tide and/or are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. A determination of navigability, once made, applies laterally over the entire surface of the waterbody, and is not extinguished by later actions or events which impede or destroy navigable capacity."[27]

The canal waters are considered navigable and are subject to Section 10.

Clean Water Act

The objective of the Clean Water Act (CWA), also known as the Federal Water Pollution Control Act, is to restore and maintain the chemical, physical, and biological integrity of waters of the United States. On April 21, 2020, the USACE published its final rule with respect to classification and identification of waters of the United States. This rule became effective on June 22, 2020 and defines waters of the United States to mean:

- territorial seas, and waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including waters which are subject to the ebb and flow of the tide;
- tributaries;
- lakes and pond, and impoundments of jurisdictional waters; and
- adjacent wetlands.[28]

[27] 33 CFR 329.4.
[28] 33 CFR 328.3.

The Clean Water Act regulates point sources of water pollution (such as discharges of municipal sewage and industrial wastewater and discharges of dredged or fill material into navigable waters and other waters of the United States) and non-point source pollution (such as runoff from streets, agricultural fields, construction sites, and mining). Section 404 of the act requires authorization from the Secretary of the Army, acting through the USACE, for the discharge of any dredged or fill material into waters of the United States.

Section 33 CFR 328.3(c)(16) defines wetlands to mean areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas. It should be noted that jurisdictional wetlands may only be identified and delineated by qualified wetlands specialist by means of a site visit. Most mapped wetlands prepared by the U.S. Federal Wildlife Service and presented in the National Wetlands Inventory (NWI) are mapped using remote sensing techniques. The purpose of the NWI maps is for study and not for regulation. Furthermore, they do not utilize the same definition of wetlands used by the USACE. The NWI wetlands are helpful in indicating where wetlands may be, but they may not be used for regulatory purposes.

Under Section 401 of the Clean Water Act, any applicant for a federal permit or license for an activity that may result in a discharge into navigable waters of the United States must provide to the federal agency issuing a permit a certificate (either from the state where the discharge would occur or from an interstate water pollution control agency) that the discharge would comply with Sections 301, 302, 303, 306, 307, and 316 (b) of the Clean Water Act. In New York State, the Section 401 Water Quality Certificate would be issued by the NYSDEC.

Under Section 404(e) of the Clean Water Act, the USACE can issue general permits to authorize activities that have only minimal individual and cumulative adverse environmental effects. General permits can be issued for a period of no more than five years. A Nationwide Permit (NWP) is a general permit that authorizes activities across the country, unless a district or division commander revokes the nationwide permit in a state or other geographic region. The USACE Division Engineers may add, after public review and consultation, regional conditions to nationwide permits in order to protect local aquatic ecosystems or to minimize adverse effects on fish or shellfish spawning, wildlife nesting or other ecologically critical areas. In addition, the NWP require issuance of Section 401 Water Quality Certification and Coastal Consistency Determination (CZM) by the designated state agencies. The current NWP were issued in 2022 ~~2017 and will need to be reauthorized in 2022~~. These permits provide expedited review of projects that have minimal impact on the aquatic environment. A separate permit does not need to be issued for an action that meets the conditions of an NWP. If the conditions cannot be met, then a regional or individual permit will be required. There are 52 NWPs for various actions and activities. It is anticipated that most EEIP activities would fall under NWP 3 Maintenance and NWP 13 Bank Stabilization.

Article 24 of the New York State Environmental Conservation Law

NYSDEC is responsible for implementing New York State's Freshwater Wetland Regulatory Program as implemented in 6 NYCRR Parts 663, 664 and 665. This program is intended to prevent despoliation and destruction of freshwater wetlands in accordance with the environmental protection regulations of the state. These regulations were designed to preserve, protect, and enhance the present and potential values of wetlands; protect the public health and welfare; and be consistent with the reasonable economic and social development of the state.

Unlike federal wetlands, the NYSDEC is required to map all protected wetlands, with the exception of the Adirondack Park Region, which is mapped by the Adirondack Park Agency. Furthermore, the regulated area for NYSDEC wetlands includes a 100-foot adjacent area, or buffer. Most NYSDEC freshwater wetlands cover an area of 12.4 acres or more unless they are considered to have unusual importance. However, NYSDEC will often conduct or require field delineations to confirm mapped wetland boundaries or connected regulated surface waterbodies and adjacent areas.

Under Article 24, the NYSDEC regulates activities in freshwater wetlands and in their 100-foot adjacent areas. One of the regulated activities is the application of pesticides.

Protection of Waters, Article 15, Title 5, New York State Environmental Conservation Law

The NYSDEC is responsible for administering Protection of Waters regulations to prevent undesirable activities on surface waters (streams, lakes, and ponds) through 6 NYCRR Part 608. All waters of the state are provided a class and standard designation based on existing or expected best usage of each water or waterway segment as follows:

- The classification AA or A is assigned to waters used as a source of drinking water.
- Classification B indicates a best usage for swimming and other contact recreation, but not for drinking water.
- Classification C is for waters supporting fisheries and suitable for non-contact activities.
- The lowest classification and standard is D.

Waters with classifications A, B, and C may also have a standard of (T), indicating that it may support a trout population, or (TS), indicating that it may support trout spawning. Streams and small water bodies located in the course of a stream with a classification of AA, A, or B, or with a classification of C with a standard of (T) or (TS), are collectively referred to as "protected streams," and are subject to the stream protection provisions of the Protection of Waters regulations.

In addition to regulating protected streams, ECL Article 15 regulates excavation and fill in navigable waters such as the canal.

As a state public corporation, the NYSCC is not required to obtain Article 15 permits from the NYSDEC; however, the NYSCC does coordinate and comply with substantive requirements of Article 15.[29]

State Pollutant Discharge Elimination System (SPDES)

Under Section 402 of the federal Clean Water Act, stormwater discharges to the waters of the U.S. require authorization by a National Pollutant Discharge Elimination System (NPDES) permit or an authorized state permit program. New York State has established the State Pollutant Discharge Elimination System (SPDES) program for controlling wastewater and stormwater discharges to groundwaters and surface waters; the SPDES program is an authorized program under the Clean Water Act. New York State has established the SPDES program for controlling wastewater and stormwater discharges to groundwaters and surface waters under 6 NYCRR Articles 2 and 3.

National Wild and Scenic Rivers Act of 1968 (16 USC §§ 1271-1287; Public Law 88-29 and 90-542, as amended)

The National Wild and Scenic Rivers Act states that it is "the policy of the United States that certain selected rivers of the Nation which, with their immediate environments, possess outstandingly remarkable scenic, recreational, geological, fish and wildlife, historic, cultural or other similar values, shall be preserved in free-flowing condition, and that they and their immediate environments shall be protected for the benefit and enjoyment or future generations." The National Wild and Scenic Rivers System list is maintained by the National Park Service (NPS). To be listed, a river must be free-flowing and possess one or more outstandingly remarkable values. It is not anticipated that any of the project area embankment segments would qualify for the system or for the Nationwide Rivers Inventory (NRI), since they would not be free-flowing segments.[30]

New York State Wild, Scenic and Recreational Rivers Act (Article 15, Title 27; 6 NYCRR Part 666)

New York State's Wild, Scenic and Recreational Rivers Act protects those rivers of the state that possess outstanding scenic, ecological, recreational, historic, and scientific values. Based on Part 1 of the SEQR Full Environmental Assessment Form, there are no New York State listed Wild, Scenic and Recreational Rivers in the project area.

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[29] ECL Section 15-0107.1

[30] The Nationwide Rivers Inventory is a listing of free-flowing river segments in the United States that are believed to possess one or more "outstandingly remarkable" values and are potential candidates or inclusion on the National Wild and Scenic River System.

Pesticides

According to 6 NYCRR 25, "pesticide" means:

- Any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any insects, rodents, fungi, weeds, or other forms of plant or animal life or viruses, except viruses on or in living humans or other animals, which the department shall declare to be a pest; and
- Any substance or mixture of substances intended as a plant regulator, defoliant or desiccant. Pesticide use means performance of the following pesticide-related activities: application; mixing; loading; transport, storage or handling after manufacturer's seal is broken; cleaning of pesticide application equipment; and any required preparation for container disposal.

This definition includes weeds or other forms of plant life, and therefore takes in herbicides as a form of pesticide. For purposes of this discussion, the term "pesticide" will include the use of "herbicides."

A NYSDEC website states:

> "Pesticides, when properly used for the control of insects, fungi, weeds, and nematodes, and as defoliants, desiccants, and plant regulators and for related purposes, are valuable, important and necessary to the welfare, health and economic well-being of the people of New York. However, such materials, if improperly used, may injure health, property and wildlife."[31]

To ensure that such materials are properly used, the NYSDEC has jurisdiction in all matters pertaining to the distribution, sale, use and transportation of pesticides under Sections 33-0301 and -0303 of the Environmental Conservation Law (ECL).

To protect wildlife, pesticide use on National Wildlife Refuges must be in compliance with FIFRA and other federal laws and authorities including the National Environmental Policy Act, the Endangered Species Act, Migratory Bird Treaty Act, and the National Historic Preservation Act, state pesticide laws, and label instructions. The use of pesticides on refuges is governed by the U.S. Department of Interior Integrated Pest Management Policy (517 DM 1), the U.S. Fish and Wildlife Service (USFWS) Pest Management Policy and Responsibilities (30 AM 12), and the USFWS Refuge Manual (7 RM 14).

[31] "Pesticide Statutes, Regulations, and Policies," New York State Department of Environmental Conservation, accessed December 1, 2020, https://www.dec.ny.gov/regulations/8527.html

3.4.1 Environmental Setting

EEIP activities have the potential to impact wetlands and other surface water bodies located adjacent to the embankments of the canal system, and to the canal itself, which is contained within embankments on one or both sides. The waterbodies within the project limits that were mapped for the Part 1 Full Environmental Assessment Form (FEAF) include: NYSDEC Freshwater Wetlands; National Wetland Inventory (NWI) freshwater wetlands; New York State classified streams and waterbodies; National Rivers Inventory (NRI) segments;[32] and the canal itself.

NYSCC compiled wetlands and water body information in a series of maps that accompanied the Part 1 FEAF for the EEIP. The maps visually describe the environmental setting in terms of wetlands and waterbodies. The data used in developing these maps will be updated as needed and will form the starting point for environmental reviews pertaining to wetlands and waterbodies when EEIP activities are planned for specific areas.

Waterways in the project area include approximately 40% of New York State's freshwater resources and drain nearly half of the state's total land area. The quality and quantity of the water are essential for navigation, drinking, recreation, irrigation, and a healthy ecosystem for plants, fish and animals. Precipitation varies within the state and across the seasons, with a typical monthly precipitation rate of one to six inches. The amount and pattern of distribution typically supports the state's needs. Snowfall is significant and varies widely across the Corridor, with an average annual range from 70 to 165 inches per year. Due to its expansive geography, the water resources in the project area are managed by a number of different entities.[33] The project area cuts across five major drainage basins:[34]

- Lake Champlain and its tributaries flow north to Canada and the St. Lawrence River.
- The Hudson-Mohawk River system flows east from Rome and south from the Adirondack Mountains to the Atlantic Ocean.
- The Oswego River flows north to Lake Ontario, draining the Ganargua Creek, Clyde River, and the Finger Lakes by way of the Seneca River from the west and Wood Creek, Oneida Lake, and the Oneida River from the east.
- The Genesee River flows north to Lake Ontario.
- The Lake Erie drainage area flows west to the Niagara River, which flows north to Lake Ontario.

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[32] One NRI segment is Oak Orchard Creek, which crosses the canal at Medina. This crossing would not involve work on an earthen embankment. Another NRI is a segment of the Clyde River east of Lyons. Its outstandingly remarkable value is: "historic." For most of this segment the canal is parallel to the general direction of the river. See Section 3.10 regarding historic and archaeological resources. Another NRI is a segment of the Mohawk river east of Stanwix, which specifically states, "omitting the Erie Canal."

[33] See Water Supply and Management, page 4-15.

[34] See Canal System Hydrology, page 4-14.

3.4.2 Potential Impacts of Proposed Action

Direct Impacts

EEIP activities will not involve replacement, relining or rehabilitating dive culverts and cross culverts, nor will they involve the replacement or rehabilitation of waste weir and waste gate structures. Such activities would be progressed as separate SEQR actions. While some EEIP activities would have no effects on surface waters and wetlands, some activities in some locations would result in impacts on wetlands and waterbodies. These are listed and described below.

Grading and installation of seepage control features on the canal and feeder embankment slopes:
Construction of seepage control features (buried or exposed blanket drains) to control seepage, which is detrimental to the integrity of embankment slopes, would have the potential to impact existing state and federal wetlands. These wetlands were not present on the embankment slopes when the embankments were originally constructed. In some areas, over time, unanticipated seeps provided the hydrologic function to support the wetlands. Wetland vegetation and hydric soils subsequently developed in these locations, which may make them jurisdictional wetlands. Given the location of these wetlands, avoidance and minimization of impacts to them are impossible as they would continue to compromise the integrity of the earthen embankment. There is a potential for such wetlands to be impacted through the provision of seepage controls, which would remove the source of water to the wetlands. They may also directly remove existing wetland vegetation and replace hydric soils with granular material to control seepage and prevent unsafe erosion of the earthen embankment.

Grading, installation of seepage control features beyond the toe of embankment slopes.
In some instances, the construction of seepage control features and/or flattening of embankment slopes would extend outside the existing toe of slope. In such cases wetlands at and beyond the toe of embankment slope, would be impacted. The maximum limits of these EEIP activities, when not constrained by the NYSCC right-of-way, would not extend more than 15 feet or, if longer, H/2 outside the toe of existing or improved toe of slope (see **Figure *3.2-2***), except in cases where the embankment height exceeded 30 feet. Outward extension of embankment toes may impact streams or wetlands that may be present at or adjacent to the existing toe of slope.

Re-establishment or modification of drainage channels, perennial streams, and intermittent streams along or beyond the toe of embankment slopes: Some locations along the toes of embankment slopes include drainage channels designed with the canal improvements to convey surface and ground waters along embankment toes to other receiving streams. Some locations along the toes of embankment slopes include natural perennial or intermittent streams typically located near the toe of the existing embankment. Although EEIP activities are likely to cause temporary impacts to these features, and in some instances, permanent relocation of

these features to accommodate embankment widening, these features would be retained as they serve an important engineering function in conveying surface and subsurface drainage away from the toe of embankment slopes. If wetlands, they would also retain any wetland functions and services. It is likely that in some instances the banks of some drainage channels and streams would need to be lined with riprap to protect the toe of embankments from becoming scoured from stream velocities and shear stresses.

Removal of tree vegetation on the lower portion of embankment slopes and in the 15-foot zone that extends outward from the toe of slope: Potential impacts include removal of vegetation within wetlands or within wetlands adjacent areas. These are discussed further in Section 3.7.

Removal of tree vegetation resulting in the loss of shade to surface waters: Removing shade from along surface waters could cause the water to warm, which could cause stress on aquatic species. Most earthen embankments where vegetative maintenance would occur are located on the outboard slopes, which would not shade water. Furthermore, the EEIP only applies to earthen embankments which comprise approximately twelve percent of system. In general, only embankments on the south side have potential to significantly shade the canal which further reduces the potential for impacts. Therefore, the frequency of such an impact would be at a negligible magnitude.

Installing or repairing riprap within the canal or feeder prism: Although wetlands are not typically encountered within the canal or feeder prisms, field inspections would be conducted to confirm whether wetlands or wetland-adjacent areas are present within the project area. Such wetlands or wetland-adjacent areas would be impacted by installation or repair of riprap. In locations where the canal or water level is seasonally raised and lowered, it is less likely that a wetland would have a sufficiently consistent hydrologic source. It is therefore concluded that implementation of the EEIP where the installation or repair of riprap takes place in a wetland or wetland-adjacent area would result in permanent impacts. Installation of riprap below the normal pool elevation of the canal (which should be considered the Ordinary High Water elevation) would also constitute the placement fill in a navigable waterway.

The use of pesticides: The NYSCC does not have a policy to apply pesticides to all embankment areas on a routine basis. Use of pesticides is limited to: invasive species control; control of vegetation where mechanical means is not practical or safe; and in the establishment of pollinators. ~~Instead, t~~The NYSCC Operations Manager makes the decision to use pesticides based on the need, on effectiveness and on consideration of potential environmental effects. The use of pesticides for vegetation removal must be reviewed and approved by the Director of Environmental Health & Safety. When pesticides are used, they are used only by licensed, certified applicators who apply the products in strict conformance with manufacturer's instructions and NYSDEC regulations.

One example where a decision would be made to use pesticides would be for the treatment of invasive plants such as Japanese Knotweed (*Polygonum cuspidatum*). The use of pesticides is one means of treating infestations of such plants (See Section 3.7 Ecology (Plants and Animals)). Treatment of Japanese Knotweed in particular is addressed in a Best Management Practice sheet attached to the *Guide Book*.

Any time a pesticide is used on the earthen embankments, there is a potential for excess pesticide to wash into the canal itself or into adjacent streams or wetlands. The use of pesticides is not routine, but rather on an as-needed basis. Implementation of the EEIP is not anticipated to increase the frequency of use of pesticides or in the way they are used. Procedures and regulations for the use and application of pesticides would minimize the impact to adjacent surface waters, wetlands, and wetlands adjacent areas from the use of pesticides. Therefore, due to the infrequent use, and, when used, the controlled use of pesticides, there would not be a significant impact to streams and wetlands.

Indirect Impacts

There are surface waters, wetlands, and wetland-adjacent areas affected that would be not necessarily be immediately adjacent to earthen embankments. For many of the EEIP activities described above, indirect impact may include the impacts resulting from erosion and the release of sediment during construction and moved to the adjacent resources in stormwater runoff. This is covered in more detail in Section 3.2.

The potential for pesticides to run off is discussed above. These pesticides could affect surface waters and wetlands downstream of the location of the EEIP activity. The potential for diversion of streams at the toe of the embankments and the control of seeps could also affect flows downstream. In some cases, such changes could have an indirect effect on wetlands by removing their source of water.

Cumulative Impacts

The potential direct and indirect impacts resulting from EEIP activities are described above. With regard to previous activities, there were certainly impacts to surface waters and wetlands from the original construction of the canal and the earthen embankments. Over time, streams have adjusted; in many locations, wetlands have formed as a result of the construction of the earthen embankments and, in some cases, from seeps in the earthen embankments. The impacts to surface waters and wetlands from EEIP activities have the potential to impact surface waters and wetlands once again. These could combine with impacts from other activities in the adjacent area such as commercial, industrial and residential developments, and public infrastructure. Specific embankment restoration projects are generally accomplished in dis-contiguous segments. There is potential for different segments to impact the same surface water/wetland resources. The cumulative impact would then be the sum of all of the impacts to that resource

from the various segments. EEIP activities accomplished at various times in the future on the same resources would also add together to arrive at the cumulative impacts. The timing of such impacts would be spread out through appropriate planning for EEIP activities, including stakeholder coordination as described in Sections 9 and 10 of the *Guide Book*.

3.4.3 Potential Impact of Alternatives

Under the Null or No-Action Alternative, any earthen embankments would be ~~left to fail~~ at greatest risk of failure compared to other alternatives. Prior to any such failure, there would be no measurable impact to surface waters and wetlands within the canal right-of-way or at adjacent property. At such time that the embankments would fail, water contained within the canal prism would be rapidly released. The risks associated with such an event are described in Appendix B. Depending on the location of the breach, the surrounding area would be inundated to various depths depending on topography. A breach in a canal or feeder embankment having a water depth of 12 feet is estimated to occur over 1½ hours, enlarge to 150 feet wide and discharge a peak flow of between 5,000 and 10,000 cfs. The resulting flood wave would seriously impact existing surface waters and wetlands downstream of the location of the breach. Wetlands and waterbodies adjacent to and downstream of the canal are locations where breach flows would be the most concentrated, producing significant depths, velocities, and shear stresses, and on the falling leg of the hydrograph would deposit sediments that would be damaging to wetlands and waterbody water quality.

Under the Ad-Hoc Alternative or Project-By-Project Approach, the ultimate impact to surface waters and wetlands inside or outside of the earthen embankments would be similar to that of the proposed action. The difference would be in timing of the impacts. Under the EEIP program, the maintenance would be planned and executed proactively, while under the Ad-Hoc Alternative, the maintenance would be commenced when conditions become unsafe, increasing the potential for a breach over that of the proposed action. In addition, the ad-hoc approach has the potential for greater impacts than the EEIP actions, because emergency repairs may be necessitated as the canal and feeder embankments deteriorate. Emergency repairs may require canal shutdown during navigation season and may have a greater effect on adjacent wetlands and waterbodies than an efficiently planned embankment maintenance operation.

3.4.4 Mitigation

Specific EEIP actions and the avoidance, minimization and mitigation measures, where impacts are found to occur, would be addressed on an individual project basis. Field investigations are required to verify the presence of regulated wetlands and assess stream conditions. These investigations would be conducted for ~~on a~~ individual embankment sections ~~segment-by-segment basis~~ where EEIP activities are being planned. Through the EEIP planning activities, as presented in Sections 8 and 9 of the *Guide Book,* many potential impacts to surface waters and wetlands can be avoided; however, due to the proximity of surface waters and wetlands to the earthen embankments, this will not always be feasible as discussed above. In such cases, permits

may be required. The governing language of state and federal surface water and wetland permits is based on the principles of avoidance, minimization and mitigation where avoidance and minimization are not feasible. These are summarized in Section 8 of the *Guide Book* and include:

Section 10 Nationwide or Individual Permits
This would apply to impacts to the canal itself. See Section 404 for a discussion of mitigation.

Section 404 Nationwide or Individual Permits
These would apply to fill in jurisdictional surface waters and wetlands. When fill in jurisdictional surface waters and wetlands can't be avoided, they are required to be ~~should be~~ minimized. A nationwide permit may apply, such as a Nationwide Permit 3 for Maintenance or a Nationwide Permit 13 for Bank Stabilization. Under these permits, mitigation is required for wetland loss above 0.1 acres. The mitigation may be in form of providing new wetland areas to compensate for the loss. In recent years, the USACE has found that the most effective form of compensatory mitigation is through wetland mitigation banks, where available, or through in-lieu fee programs where these are available. The ratio of credits to impacted wetlands must 1:1 or greater. The ratio depends on the type and values of the wetlands to be lost. The NYSCC would utilize either of these two methods of compensatory mitigation where available. Where mitigation banks or in-lieu-fee programs are not available, compensatory mitigation would be developed to provide new or restored wetland areas as determined from consultation with the USACE.

Section 401 Water Quality Certificates
This would apply to actions requiring Section 404 permits. The mitigation would be associated with the Section 10/404 permit mitigation.

NYSDEC Article 24 Freshwater Wetland Permits
This permit is for impacts to NYSDEC freshwater wetlands or for construction within the 100-foot adjacent area. Most NYSDEC freshwater wetlands are also federal jurisdictional wetlands. Article 24 of the Environmental Conservation Law, Section 24-0105 (statement of findings) lists the benefits of freshwater wetlands that the Department is mandated to protect.[35] Freshwater wetlands provide:

- Flood and storm control by the hydrologic absorption and storage capacity; see Section 3.6
- Wildlife habitat (breeding, nesting and feeding grounds and cover for wildlife, waterfowl, and shore birds including migratory waterfowl and rare species such as the bald eagle and osprey); see Section 3.7

[35] "Wetland Functions and/or Values," New York State Department of Environmental Conservation, accessed December 10, 2020, https://www.dec.ny.gov/permits/6265.html.

- Protection of subsurface water resources and ground water recharge; see Section 3.5
- Recreation (hunting, fishing, boating, hiking, bird watching, photography, camping and other uses); see Section 3.11
- Pollution treatment by serving as biological and chemical oxidation basins
- Erosion control by serving as sedimentation areas, and filtering basins; see Section 3.2
- Protection of channels and harbors by absorbing silt and organic matter
- Education and scientific research by providing readily accessible outdoor bio-physical laboratories, living classrooms and vast training and education resources
- Open space and aesthetic appreciation derived from the fact that they are often the only remaining open areas along crowded river fronts and coastal Great Lakes regions; see Section 3.9, and 3.11
- Sources of nutrients in freshwater food cycles and nursery grounds and sanctuaries for freshwater fish; see Section 3.7

As with the federal permits above, potential impacts to a NYSDEC freshwater wetland must be avoided if at all possible and minimized if not. If unavoidable impacts or losses to wetland area remain, compensatory mitigation would be developed. The NYSDEC does not have the provision for the use of mitigation banks or in-lieu-fee programs, and compensatory mitigation must generally be on the same site or in close proximity to the affected wetland. Where appropriate mitigation can't be implemented, alternative engineering may be needed for the EEIP activities. The EEIP activity would then follow the path shown on **Figure *1.3-4*** and described in Section 1.3.4.

Coverage under NYSDEC SPDES General Permit for Stormwater Discharges from Construction Activity, Permit No. GP-0-20-001

As described in Section 3.2, EEIP activities that disturb one acre or more of soil require coverage under this permit. One of the conditions of the permit is the preparation of a Stormwater Pollution Prevention Plan (SWPPP). One part of the SWPPP is an erosion and sediment control plan, to be implemented during construction. This plan would minimize the amount of erosion and sediment that reaches downstream surface waters and wetlands during construction when the ground disturbance of construction renders the site vulnerable to erosion. Another part of the SWPPP addresses permanent effects of runoff from impervious surfaces. In the case of EEIP activities, the existing earthen embankments would be covered in vegetation and the resulting embankments would be covered in different vegetation. Both would be pervious. As discussed in Section 3.2, the change in runoff from an example EEIP activity would not be significant, additional stormwater controls would not be needed, and mitigation for stormwater would not be needed.

3.5 Groundwater

This section discusses potentially significant adverse impacts to groundwater, which includes the water table and aquifers outside the limits of NYSCC lands that may be influenced by EEIP activities. The water table is the uppermost section of the saturation zone in the ground. Although the saturation zone may rise and lower with changes in precipitation or with changes in adjacent water bodies, including the canal and feeder systems, this zone is usually located from just below the ground surface to a few feet below.

When a water-bearing rock readily transmits water to wells and springs, it is called an aquifer. While New Yorkers are not as dependent upon groundwater as much as western states, it is still a valuable resource. Groundwater, and particularly aquifers, may be used for domestic water supply, irrigation, and industry processes. Although all groundwater resources within the project area are locally important, the U.S. Environmental Protection Agency (EPA) and NYSDEC have identified the most significant of these aquifers, which are described in more detail below.

The EPA defines a sole source aquifer as one that supplies at least 50 percent of drinking water for its service area and where there are no reasonably available alternative drinking water sources should the aquifer become contaminated. As defined in the NYSDEC Division of Water Technical & Operational Guidance Series (TOGS) 2.1.3, primary aquifers are defined as "highly productive aquifers presently utilized as sources of water supply by major municipal water supply systems." They are the most productive unconsolidated aquifers in New York and are heavily utilized. Principal aquifers are defined in TOGS 2.1.3 as "aquifers known to be highly productive or whose geology suggests abundant potential water supply, but which are not intensively used as sources of water supply by major municipal systems at the present time. Principal aquifers are not as heavily utilized as primary aquifers but are still capable of providing 10 to 100 gallons or more of ground water per minute. NYSCC has access to maps providing locations of sole source, primary, and principal aquifers. The EPA provides a national interactive map of sole source aquifer locations.[36] Its data is also available for use in geographic information systems (GIS). The New York State GIS Clearinghouse provides a GIS data set containing maps on primary and principal aquifers in New York. The U.S. Geological Survey (USGS) also provides maps with primary and principal aquifer locations.

This section discusses potential effects of EEIP activities on groundwater levels and groundwater quality adjacent to the NYSCC right-of-way. Please see Section 3.2 for a discussion of potential changes to groundwater levels and groundwater quality within the embankments on canal property and Section 3.4 for a discussion on potential impacts to surface waterbodies.

[36] "Map of Sole Source Aquifer Locations," U.S. Environmental Protection Agency, accessed December 1, 2020, https://www.epa.gov/dwssa/map-sole-source-aquifer-locations.

3.5.1 Environmental Setting

Table *3.5-1* identifies the cities, towns, and villages in the project area underlain by a sole source aquifer. The total intersection of the Schenectady-Niskayuna EPA Sole Source Aquifer with the project area is approximately 30 canal miles.

Table 3.5-1: Sole Source Aquifers Beneath the Project Area

Sole Source Aquifer	City	Town	Village
Schenectady-Niskayuna	Schenectady Cohoes	Waterford Halfmoon Colonie Clifton Park Niskayuna Rotterdam Glenville	Scotia

Table *3.5-2* identifies the cities, towns, and villages in the project area underlain by primary aquifers. The total intersection of primary aquifers with the NYSCC embankments is approximately 70 canal miles.

As for principal aquifers, the entire Eastern Region (Section 1- 4) and almost all of Sections 5 and 6 of the canal are located over principal aquifers, totaling approximately 320 canal miles. Sections 7 and 8 of the Western Region of the canal rarely intersects with any principal aquifers, except for a few short segments totaling approximately 8 miles.[37]

Table 3.5-2: Primary Aquifers Beneath the Project Area

Primary Aquifer	City	Town	Village
Clifton Park		Halfmoon Clifton Park	
Schenectady	Schenectady	Glenville Rotterdam Niskayuna	Scotia
Fulton	Fulton	Schroeppel Granby Volney	

[37] The Sections are described in Section 2.1 of the *Guide Book* (Appendix A).

Primary Aquifer	City	Town	Village
Baldwinsville	Syracuse	Lysander Cato Van Buren Elbridge Salina Geddes Clay	Baldwinsville
Irondogenesee	Rochester	Perinton Pittsford	Fairport Pittsford

It is possible for canal and feeder embankments to be located on or near a previously contaminated areas such as state and federal Superfund sites, state and federal Brownfield sites, PBS/CBS facilities, and active and closed landfills. In these cases, groundwater around these sites may already be contaminated due to previous activities not related to the EEIP. A screening for hazardous and contaminated materials would be done prior to performing work on an embankment segment if any portion of a reach includes excavation or temporary property acquisition. This screening process is further discussed in Section 3.14.

3.5.2 Potential Impacts of Proposed Action

Direct Impacts

Potential impacts due to the implementation of the EEIP include the possibility of groundwater contamination and the alteration of groundwater levels within and adjacent to the embankments. Alteration of groundwater levels within embankments is further discussed in Section 3.2.

NYSCC uses pesticides to control vegetation in areas where mowing or other control measures are difficult or dangerous. It is possible for pesticides to leach into groundwater systems and contaminate groundwater, through runoff, especially if applied or disposed of improperly. After a rain event, water either infiltrates into the ground or flows downhill in the form of runoff. The percent of rain that forms runoff depends on topography, plant cover, soil type and soil conditions. Runoff is greatest on steep slopes with minimal vegetation and impermeable soils. As runoff flows downhill, it can pick up contaminants, such as residual pesticides that have been previously applied, until it reaches a body of water or collects in a depression. The effects of contaminated runoff flowing into the canal is discussed in Section 3.4. If it is collected in a depression it will either evaporate or infiltrate into the soil. Groundwater is more susceptible to contamination in areas with low slopes. Therefore, there is a higher potential for infiltration into groundwater from Zone 5 (see **Figure *3.2-2***), or at the toes of earthen embankments. There are also areas of water at the base of embankment slopes that are the result of seeps through the embankments. Pollutants within the canal waters could migrate with the water in seeps to

collect at the outboard toes of embankments from where it could infiltrate into the water table. The effects of pollutants within canal waters are further discussed in Section 3.4.

Site conditions greatly affect the potential for leaching of herbicides, pesticides and other contaminants into groundwater systems. These conditions include depth to the water table, soils, geologic conditions, topography, climate, and groundwater use in the specific area. It should be noted that not all pesticides have been found to leach. It depends on the chemical properties such as solubility, degradation rate, volatilization rate, and adsorption to soil. Soil characteristics also have a large effect on leaching potential. These characteristics include soil texture, hydraulic conductivity, organic matter content, and physical structure.[38]

It is possible for the depth of groundwater to be only a few feet below the soil surface. The water table elevation generally fluctuates over the course of a year according to the amount of precipitation, drawdown due to pumping, and whether the ground is frozen. Soil type and conditions are also important to consider. The permeability of the soil layers between the ground surface and water table determine how quickly pollutants can infiltrate into groundwater. For example, clay has a much lower permeability than sand or gravel, causing pollutants to travel at a slower rate.[39]

The Natural Resources Conservation Service (NRCS) of the U.S. Department of Agriculture (USDA) provides soils data and information through its Web Soil Survey (WSS).[40] This online resource can be used for general site investigations and preliminary assessments for the project site. After the user maps the boundaries of their project site or Area of Interest (AOI), the WSS displays a map of different soil types within your AOI. Many different soil properties and qualities are available for review through the WSS Soil Data Explorer. Some available soil properties that affect leaching potential include depth to water table, hydrologic soil group, and organic matter content.

There is always a potential risk of groundwater contamination when any pesticide is used. However, NYSCC strictly follows all manufacturers' instructions and precautions, in accordance with NYSDEC requirements. All NYSCC personnel or contractors that apply pesticides on NYSCC lands must be licensed applicators. Following application guidelines and employing only licensed applicators helps to assure that groundwater is protected from potential contamination. The frequency of pesticide application is not anticipated to increase as a result of EEIP activities, and it is anticipated to be applied only where necessary. Therefore, the application of pesticides,

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38 K. S. Porter, N. M. Trautmann, and R. J. Wagenet, "Pesticides and Groundwater: A Guide for the Pesticide User," Pesticide Safety Education Program, Cornell University Cooperative Extension, accessed December 1, 2020, http://psep.cce.cornell.edu/facts-slides-self/facts/pest-gr-gud-grw89.aspx

39 Porter, Trautmann, and Wagenet, "Pesticides and Groundwater."

40 "Web Soil Survey," U.S. Department of Agriculture, accessed December 1, 2020, https://websoilsurvey.sc.egov.usda.gov/

during the implementation of the EEIP, should have only minimal adverse impacts on groundwater.

Piezometers are instruments used to measure the elevation of groundwater at a specific location. Many piezometers have been installed along NYSCC embankments to evaluate changes in groundwater elevations/pressure over time. An example of the results of a subsurface exploration of groundwater levels within multiple embankments is summarized in Section 3.2 for embankments in the Spencerport area.

Additional piezometers may be installed along NYSCC embankments as part of the EEIP, especially where seepage from embankments is observed. Seepage can greatly reduce embankment stability and can cause embankment failure if left untreated. Piezometers and weir boxes are used to quantify seepage and its potential adverse effects on the canal and feeder embankments. Seepage control measures such as blanket drains and toe drains and their effects on groundwater levels are further discussed in Section 3.2. Also refer to the Best Management Practices attached to the *Guide Book* in Appendix A under "Seepage from Embankment Contacts," "Drainage Blanket/Filter" and "Toe Drains" for more information about seepage control and seepage measurement features.

The water level within the canal is raised during the navigational season to allow for navigation. The water level in the canal is typically raised beginning in mid-May and lowered after mid-November. The effects on groundwater due to the alteration of canal water levels are discussed in Section 3.2.1. In general, groundwater levels at the outside toe of embankment were found to change less than 3 feet in response to the seasonal canal filling and draining, which is based on a fluctuation of 12 feet in canal water depth. None of the anticipated activities performed under the EEIP by themselves are anticipated to alter groundwater levels to an extent that approaches that of the seasonal water fluctuations caused by canal filling and emptying.

Indirect Impacts

EEIP activities are not expected to have any significant impacts on irrigation or private wells beyond the canal right-of way. In previous projects, groundwater elevation changes at the outside toe of an embankment in response to canal seasonal filling and draining though not found to be significant, have been shown to be of greater magnitude than the groundwater elevation changes that may occur as a result of the proposed action. It is possible for changes in drainage patterns caused by EEIP activities to cause slight changes to groundwater levels in the immediately adjacent areas; however, these would be negligible. At times, changes to groundwater elevations in an adjacent well or to drainage around or into basements may seem to coincide with EEIP activities, but the magnitude of such changes are expected to be insignificant because the magnitude of groundwater level changes at the canal right-of-way are also expected to be insignificant.

In locations where EEIP activities occur over sole source, primary or principal aquifers, there is limited potential for contaminants from EEIP activities to affect those aquifers through migration of pollutants through the soils into the aquifers. For this to occur, contaminants would have to travel through soils and substrate before reaching the aquifer. As the water travels, contaminants are collected in the upper portions of soils and substrate. To minimize the risk of contaminants, water supply wells that utilize these aquifers pump water from deep below the ground surface, beyond the depth of where contaminants generally travel. In addition, implementation of the EEIP is not expected to increase the use of contaminants (pesticides) and would require the environmental cleanup of any contamination found in the embankments during implementation of the EEIP (see Section 3.14). Environmental cleanup would eliminate the existing contaminants from being transported to off-site properties where it could be harmful to humans, aquatic and terrestrial species.

Cumulative Impacts

Contamination or changes in groundwater levels may affect groundwater from adjacent activities, such as grading and construction activities, roadway drainage, agricultural activities, and other activities. Contaminants or fluctuations in groundwater levels from EEIP activities that may affect adjacent groundwater could combine with other sources of water level changes or contamination to produce cumulative effects. The amount contributed by EEIP activities would be minor in comparison with the effects from other sources of groundwater contamination. For example, where adjacent to agricultural fields, the use of fertilizer and pesticides as an EEIP activity would only occur when needed and not on a regular basis, and it would only occur on a strip of land area. This would add a minor amount of contaminant in comparison to the adjacent acres of cropland that would receive applications of fertilizer and pesticides on a more regular basis. Furthermore, the discussion above has already concluded minor direct impact of EEIP activities on groundwater. Thus, the cumulative effects on contamination of groundwater is expected to be negligible and may actually improve groundwater where contaminants are cleaned up as a result of EEIP activities.

Conclusion

The potential for impacts resulting from EEIP activities on groundwater levels and contamination outside the canal right-of-way are expected to be insignificant.

3.5.3 Potential Impact of Alternatives

Under the Null or No-Action Alternative, pesticides would not be used. Although there would be no risk of groundwater contamination from pesticides under this alternative, vegetation would eventually overtake embankments. The root systems of the non-compatible vegetation could cause piping of the embankment, ultimately leading to embankment failure.

Under the Ad-Hoc Alternative or Project-by-Project Approach, the timing and extent of pesticide applications would be the same as those implemented by EEIP. Therefore, the impacts on groundwater within the embankment would be the same as those of the proposed action.

3.5.4 Mitigation

As discussed above in Section 3.4.4, the potential contamination of groundwater would be minimized by following all NYSDEC pesticide regulations (which also cover herbicides), manufacturers regulations, and using proper application and disposal methods. See also the discussion in Section 3.7.4.

3.6 Floodplains

Floodplains are lowland areas that carry excess water when rainfall or snowmelt cause rivers or streams to overflow beyond their normal banks. The Federal Emergency Management Agency (FEMA), authorized by the National Flood Insurance Act of 1986, has conducted flood studies on many communities in New York State.

Where any part of the EEIP work is known to be located within a FEMA floodplain, and where construction (i.e., excavation, fill, grading, paving) within the floodplain is planned, the work must comply with applicable state and federal regulations. Although the NYSCC is not required to obtain a local community Floodplain Development Permit to comply with the National Flood Insurance Program (NFIP), it is required to comply with the provisions of 6 NYCRR 502: Floodplain Management for State Projects, and with EO 11988 where federal permits are involved. The provisions of 6 NYSCRR Part 502 prohibits state agencies from causing any increase in elevation in the 100-year flood elevation of any floodplain. Executive Order 11988 requires that alternatives should be considered to avoid adverse effects and incompatible development in the floodplains. If the only practicable alternative requires a floodplain encroachment, the NYSCC should verify through hydraulic analyses or engineering judgment the extent of rise in Base Flood Elevation (BFE) and modify its maintenance activity in order to minimize potential harm to or within the floodplain if the increase in BFE is estimated to exceed 1.0 feet.

3.6.1 Environmental Setting

Most communities in New York that are traversed by the Barge Canal and feeder system have flood insurance studies completed. Older flood insurance studies were generally conducted for individual municipalities; recent studies and updates are performed on a countywide basis.

The project limits for the EEIP include sections of the Erie Canal System and feeder canals contained within earthen embankments. It excludes sections where the canal occupies rivers or lakes and is not contained within a constructed embankment. Portions of all of the actions being considered in the EEIP occur within the 100-year floodplain of the Erie Canal System, and other

portions may occur in the 100-year floodplain of streams and rivers immediately adjacent to embankment sections of the Erie Canal System.

Information concerning these floodplains is available from two sources: NFIP Flood Insurance Studies (FIS) for enrolled communities; and hydrologic and hydraulic studies that have been conducted for the NYSCC for hydraulic planning and designs for canal facility improvements.

For embankment sections of the canal, there are two types of 100-year floodplains:

1 Water within the canal prism for all embankment sections

2 In some locations, the floodplain (mapped as Zone AE, A, AO, AH or other) for a waterway may be located immediately adjacent to the canal or feeder embankment. This waterway may be parallel to the canal, or the floodplain may be associated with a waterway that crosses under the canal via a culvert or inverted siphon. **Figure *3.6-1*** illustrates a section of canal in the Town of Verona where a waterway with floodplain is parallel to the canal embankment.

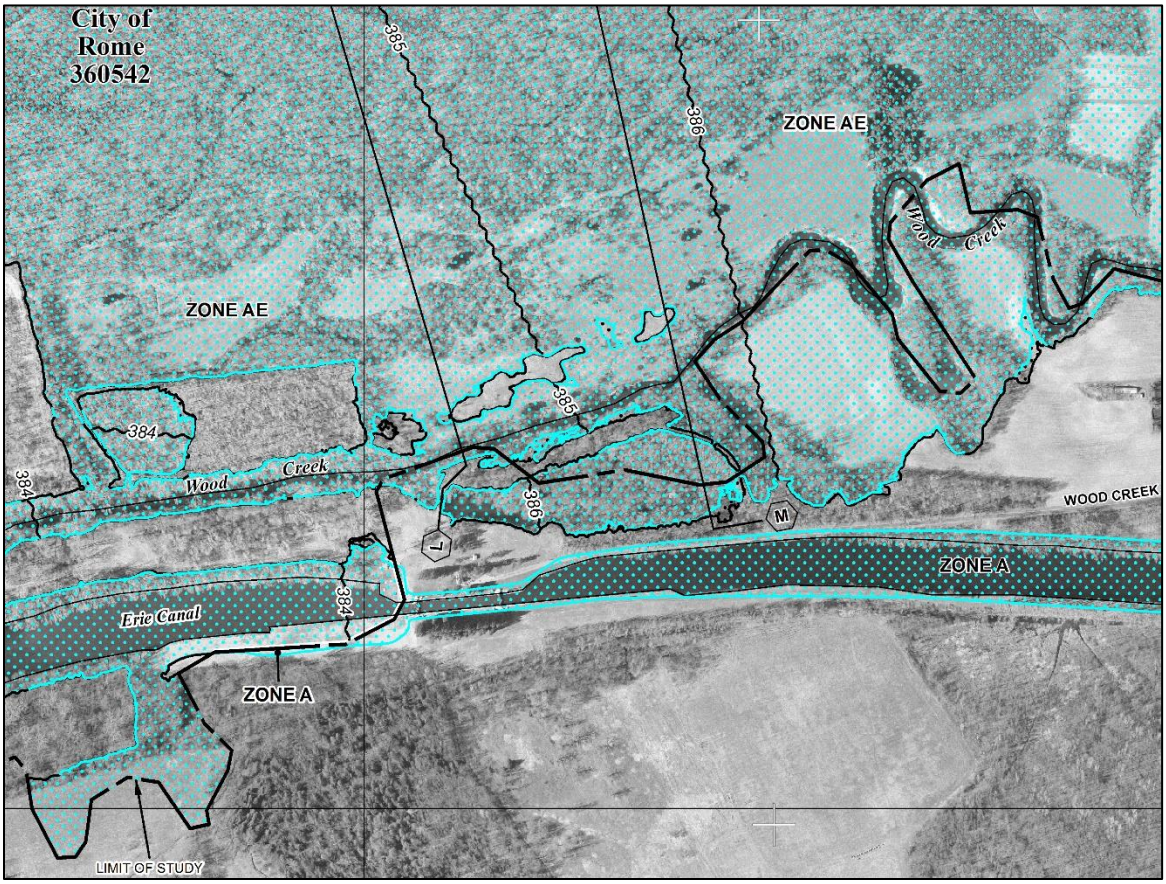

Figure 3.6-1: Excerpt from FEMA Flood Insurance Rate Map for Town of Verona, NY

Much of the canal occupies 100-year floodplains within lakes or canalized rivers such as portions of the Mohawk River. Since these sections of the canals do not have earthen embankments, their associated floodplains are unaffected by the EEIP proposed action.

3.6.2 Potential Impacts of Proposed Action

Impacts on flooding may occur as the EEIP may provide for construction and maintenance activities within floodplains and on the Canal System, which includes embankments and dams. While dam inspections, maintenance and repairs are not included in the EEIP, adjacent dams are considered under the FEAF Part 2 as they may be impacted by program activities on earthen embankments.

The traditional measure of floodplain impact has been the maximum rise in the 100-year water surface elevation caused by a proposed action as compared to the existing conditions 100-year water surface elevation. The rise in 100-year water surface will be used to evaluate the floodplain impacts of recommended actions for the Proposed Action and other alternatives.

The aspects of EO 11988 pertaining to the restoration and preservation of natural and beneficial values served by floodplains are covered as a part of other topics, including Section 3.4 and Section 3.7.

While EEIP activities are not intended to promote development on lands subject to flooding, implementation of the program would be undertaken on or adjacent to water impounding structures around already developed areas. NYSCC would assess the integrity and condition of these structures to determine potential impacts on flooding and how conducting EEIP activities may impact the integrity of those structures. Information that would be used to assess impacts to floodplains prior to site-specific EEIP activities include:

- Flood Insurance Rate Maps (FIRMs), either effective (regulatory) or preliminary (not yet adopted but containing useful flooding information)
- Flood Insurance Studies (effective or preliminary)
- Topographic survey mapping and land cover maps

Some of the recommended actions, due to their limited scale, have a minor or negligible impact on the 100-year water surface elevation. These types of recommended actions include: turf establishment and maintenance, debris removal, removing brush and trees to maintain embankment integrity, improving drainage, and installation of monitoring devices. These recommended actions would not require the development or extension of a hydraulic model to evaluate their impacts. Also, erosion protection and bank stability measures such as riprap may be required where the outboard embankment repair lies within the floodplain of an adjacent waterway. The presence of riprap would have a negligible effect on the floodplain, but if slope flattening is proposed to increase embankment stability, or if there is a proposed stream

relocation away from the embankment toe to improve embankment stability, that effect on the floodplain will be hydraulically evaluated.

Where a community has floodplain maps, the canal section proper between the inboard banks is usually mapped as Zone A (floodplain) where base flood elevations have not been determined. Maintenance activities on the inboard embankment slopes typically involve placing riprap slope protection. The *Guide Book* Appendix 1, Best Management Practices, specifies that the original grade lines of the inboard embankment slopes are to be re-established. In other words, the original canal prism dimensions are restored with removal and reshaping of the embankment as required. Since these repairs do not result in a net addition of fill, there is no impact to the Zone A floodplain within the canal. In a few cases, waterways are conveyed through the canal embankment section and a numbered Zone A or AE zone has been established. In these special cases, the effects of the Best Management Practices would also be negligible since the repairs do not result in a net addition of fill.

For a few recommended actions, a HEC-RAS model[41] may be used to evaluate impacts on the 100-year water surface elevation resulting from a proposed EEIP activity. The primary location where a HEC-RAS model may be used is where an embankment outboard slope is to be flattened or an abutting stream is to be relocated to provide stability or to control seepage, and the repair area is located within the 100-year floodplain of a waterway that crosses the canal or runs parallel and immediately adjacent to it. If the waterway floodplain adjacent to the canal is Zone A (no base elevation determined), and the action consists of slope flattening of the outboard embankment or an abutting stream relocation away from the embankment toe, including stream bank protection such as rock vanes or spurs, the potential effects on the floodplain will be evaluated using the FEMA flood map and mapped topographic data. If it appears there is the potential for an increase in base flood elevation of one foot or more, engineering analysis would be done using HEC-RAS. The analysis would confirm if the Base Flood Elevation (BFE) would be raised more than one foot, and if so, the channel section may be widened to offset the impact of additional fill from the embankment and reduce the BFE increase to less than one foot.

No proposed actions for the EEIP are likely to result in beneficial impacts (i.e., reductions in the 100-year flood level).

The following impact thresholds are based on NFIP regulations and hydraulic modeling practice:

> Negligible — The recommended action(s) cause a rise in 100-year flood water surface elevation of less than 0.1 feet.
> Minor: Adverse — The recommended action(s) cause a rise in 100-year flood water

[41] HEC-RAS is a computer program developed by the U.S. Army Corps of Engineers Hydrologic Engineering Center for modeling water flowing through natural rivers and open channels.

surface elevation exceeding 0.1 feet but less than 0.5 feet.
Moderate**:** Adverse — The recommended action(s) cause a rise in 100-year flood water surface elevation exceeding 0.5 feet but less than 1.0 feet.
Major**:** Adverse — The recommended action(s) cause a rise in 100-year flood water surface elevation that exceeds 1.0 feet. Such actions represent very large scale activities that are a significant encroachment on the floodplain.
Impairment — The recommended action(s) cause a rise in 100-year flood water surface elevation that exceeds 1.0 feet, and causes increased damages to agricultural lands, buildings, structures, bridges, roadways or any private or public feature.

To help standardize certain maintenance activities, various Best Management Practices have been developed, which act as the NYSCC standard for in-house or contract maintenance activities. Common maintenance activities have been categorized by the type of embankment feature (vegetation, erosion, etc.) and detrimental issue (trees and brush, cracks, etc.). Each Best Management Practice has been developed to cover common repair needs that should accommodate most embankments. Where a maintenance action is proposed within a floodplain, the limits should be shown on the project drawings of site-specific embankment segments.

The EEIP may include some or all of the following categories, as described in the ~~*NYSCC Embankment Inspection & Maintenance*~~ *Guide Book:* Vegetation Management, Embankment Repairs and Monitoring Devices.

Direct Impacts

The EEIP allows consideration of a broad range of recommended actions shown above, from those requiring no analyses of impacts on water surface elevation to those requiring HEC-RAS analysis. Because of this, impacts of proposed improvements are expected to range from Negligible to Minor Adverse, depending upon the recommended actions taken.

All vegetation management and monitoring device actions will have no impacts on water surface elevations. In addition, embankment repairs that restore the canal prism to its original size and shape will have no impacts on water surface elevation, since there is no net addition of fill or reduction in cross sectional area. Also, embankment repairs that involve placing fill to flatten the outboard embankment slope will have no impact on water surface elevations where there is no floodplain outside of, and adjacent to, the canal or feeder embankment. Embankment repairs that involve placing fill to flatten the outboard embankment slopes, relocating a stream located along the embankment toe, or installing rock vanes or spurs may have an impact on water surface elevations, only where this work occurs in a mapped floodplain adjacent to the canal or feeder embankment. The extent of impact may be determined through a HEC-RAS analysis if required in these instances.

If a HEC-RAS analysis determines that placing fill for embankment repair would increase the water surface elevation for the 100-year flood in the mapped floodplain adjacent to the canal, alternatives would be investigated to eliminate the rise in water surface, such as alternative bank stabilization measures or compensatory removal of fill from the floodplain to eliminate the rise in water surface. Furthermore, no fill would be placed within the floodway portion of the floodplain, as that action is prohibited to State agencies under 6 NYCRR Part 502.

Indirect Impacts

No indirect impacts are anticipated for the EEIP activities.

Cumulative Impacts

The potential for adverse direct and indirect impacts is discussed above. Local towns, cities and counties in New York State are responsible to regulate floodplain development in accordance with the NFIP. The NYSCC as a state agency is required to avoid actions that raise the water surface elevation within the 100-year floodplain, as per 6 NYCRR Part 502. Since there would be no indirect effects from the action or from others, it is ~~therefore~~ concluded that the potential for cumulative impacts would be restricted to the potential for direct impacts.

Conclusion

The potential adverse impact from this alternative would be limited to the direct impacts. In the analysis, the adverse impacts would range from Negligible to Minor Adverse and would be very site-specific. The impacts would also be spread out over time. There are no EEIP activities allowed where potential effects would impair the beneficial floodplain resources of New York State traversed by the embankment portions of the canal.

3.6.3 Potential Impact of Alternatives

Under the Null or No-Action Alternative, any earthen embankments would be ~~left to fail~~ at greatest risk of failure compared to other alternatives. Prior to any such failure, there would be little or no measurable impact to floodplains inside or outside of the earthen embankments. At such time that the embankments would fail, water contained within the canal prism would be rapidly released. The risks associated with such an event are described in Appendix B. Depending on the location of the breach the surrounding area would be inundated to various depths depending on topography. A breach in a canal or feeder embankment having a water depth of 12 feet is estimated to occur over 1½ hours, enlarge to 150 feet wide and discharge a peak flow of between 5,000 and 10,000 cfs. This water would be released as a flood wave that would have the potential to cause serious damage or destroy downstream homes and businesses. The most significant impact would be loss of life from occupied structures in the flood wave path. Other damage would include buildings, highways and utility infrastructure within the inundation zone. Additional damage would be caused to public parkland, agricultural

lands, historic resources or aesthetic resources of local or statewide importance. The water quality of the canal itself and downstream waterways would be impacted by the flood wave. After the breach flood wave, the floodplain of adjacent or downstream waterways would be impacted by the deposition of sediment from the flood.

Under the Ad-Hoc Alternative or Project-by-Project Approach, the ultimate impact to floodplains inside or outside of the earthen embankments would be similar to that of the proposed action. The difference would be in timing of the impacts. Under the EEIP program, the maintenance would be planned and executed proactively, while under the Ad-Hoc Alternative, the maintenance would be commenced when conditions become unsafe, increasing the potential for a breach over that of the proposed action. In addition, the ad-hoc approach has the potential for greater impacts than the EEIP actions, because emergency repairs may be necessitated as the canal and feeder embankments deteriorate. Emergency repairs may require canal shutdown during navigation season and may have a greater effect on adjacent waterway floodplains than an efficiently planned out embankment maintenance operation.

3.6.4 Mitigation

Under the EEIP program, avoidance of extending embankments into floodplain areas is a priority. Within the canal prism, inboard embankment slopes would be repaired and restored to original line and grade, thereby causing no effect to the canal floodplain. Outside the canal prism, site conditions would be analyzed to determine if an EEIP action will affect any floodplain located outside the canal. If there is a potential effect, the range of options may include reconstruction of the embankment to original line and grade or, if necessary, excavation within the floodplain to compensate for the placement of fill. Such a solution could go beyond the scope of EEIP activities and require a supplemental or individual review under SEQR.

As mentioned above, the adverse impacts would range from Negligible to Minor Adverse. There would be no mitigation for Major or Adverse impacts or Impairment, as actions that cause such impacts are not allowed by law. For this reason, mitigation of impacts to floodplains is limited to avoidance and minimization.

3.7 Ecology (Plants and Animals)

Ecology is the study of the relationship between organisms and their physical environment. This section describes the effects that the implementation of the EEIP would have on plants, animals, and their potential habitat along canal embankments. The greatest impact caused by the implementation of the EEIP would be the alteration of landscapes along canal embankments to maintain them in accordance with best engineering practices, a high level of safety, and restore them to original engineered configuration. Forested embankments provide habitat to wildlife species and a potential wildlife corridor among areas of highly fragmented land. Plants and animals that inhabit embankments may include those listed as federal or State rare, threatened,

or endangered species. The processes in which these sensitive species and environments are dealt with are further discussed in this section.

3.7.1 Environmental Setting

"Ecozones" are ecological zones of New York State that help classify the statewide distribution of ecological communities. An ecological community is a collection of interacting plants and animals, sharing a common environment. These ecozones were described by Dickinson (1979) and Will *et al.* (1979), and later adapted by John Ozard of the NYSDEC. This classification system is an artificial construct that attempts to establish New York State into discrete community types. It is important to recognize that these ecozone boundaries have been drawn across continuous ecological gradients and are not distinct transitions in the real landscape.

Since the canal system in New York is so extensive, it passes through many different ecozones. The most northern segment of the New York State Canal System is the Champlain Canal. The Champlain Canal begins in the Village of Whitehall. The ecozone of this area is the Hudson Valley. When the Champlain Canal joins the Erie Canal, the ecozone shifts to the Mohawk Valley Ecozone. The Mohawk Ecozone extends west until the City of Utica, where it shifts to the Great Lakes Plain Ecozone. The canal continues in this ecozone until the canal ends at the Niagara River. The Oswego Canal also extends through the Great Lakes Plain Ecozone. The Bradley Brook, Madison and Chenango Feeder Canals are in the Appalachian Plateau Ecozone.

The New York State Canal System is a combination of natural rivers and man-made canals. Most of the canal system's aquatic environment falls under the community classification of Riverine Cultural. This subsystem includes communities that are created and maintained by human activities. Characteristic fish found within artificial waterways throughout the state include brown bullhead (*Ameiurus nebulosus*), brook stickleback (*Culaea inconstans*), central mudminnow (*Umbra limi*), brook silverside (*Labidesthes sicculus*), golden shiner (*Notemigonus crysoleucas*), and pikes (*Esocidae*).[42]

Within the Village of Fort Edward, the Champlain Canal connects to the Hudson River. The canal system extends along the Hudson River until the Hudson River intersects the Mohawk River in the Town of Waterford. The Hudson and Mohawk Rivers' aquatic communities are characteristic of an unconfined river. Unconfined rivers are defined as being deep, wide, and usually represent a network of fifth to sixth and up to seventh order stream segments.[43] They are typically

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[42] Gregory J. Edinger, et al., eds. *Ecological Communities of New York State*, Second Edition, March 2014, New York Natural Heritage Program, 30, accessed December 10, 2020, https://www.dec.ny.gov/docs/wildlife_pdf/ecocomm2014.pdf

[43] The order of a stream segment identifies its relative size. Stream order depends on a stream's intersection with another stream of the same order. For example, a first order stream changes to a second order stream after it merges with another first order stream. A stream can only increase in order when it combines with another stream of the same order.

surrounded by floodplain forest or sediment bars. Characteristic fish of these rivers are sturgeon (*Acipenser spp.*), shad (*Alosa spp.*), and suckers (Catostomids) such as redhorses (*Moxostoma spp.*). Many of the fish are anadromous. Other characteristic fish include warmwater fish such as rock bass (*Ambloplites rupestris*), northern pike (*Esox lucius*), largemouth bass (*Micropterus salmoides*), smallmouth bass (*Micropterus dolomieui*), pumpkinseed (*Lepomis gibbosus*), brown bullhead (*Ameiurus nebulosus*), and white sucker (*Catostomus commersoni*). Pools may also contain pickerel (*Esox americanus*). Macroinvertebrates in these rivers may include many different mollusk species, as well as stoneflies (Plecoptera), beetles (*Stenelmis spp*.), midges (*Polypedilum spp.*), mayflies (Baetidae, Heptageniidae, Ephemeridae), clams, odonates (Aeshnidae, Calopterygidae, Coenagrionidae, Gomphidae), caddisflies (*Cheumatopsyche spp*.), and leeches (Hirudinea). Macroinvertebrate species vary greatly on regional conditions. Typical submergent vascular plants may include naiad (*Najas flexilis*), pondweeds (*Potamogeton epihydrus, P. perfoliatus, P. spirillus*), bur-reed (*Sparganium fluctuans*), tapegrass or wild celery (*Vallisneria americana*), and Robbins spikerush (*Eleocharis robbinsii*). Floating aquatic macrophytes such as white water-lily may be found in shallow shores. Invasive aquatic vegetation such as Eurasian milfoil (*Myriophyllum spicatum*) and water chestnut (*Trapa natans*) may also occur along shores (*Nymphaea spp*.).[44]

The New York State canal system diverges from the Mohawk Canal in the Village of Frankfort and extends through Oneida Lake into the Oneida River. At the intersection of the Towns of Schroeppel, Lysander, and Clay, the Oneida River splits into the Oswego and Seneca Rivers. The Oneida, Oswego, and Seneca rivers are also unconfined rivers with similar characteristic species found in the Hudson River. The Seneca River flows into Onondaga Lake and continues through Cross Lake. The Erie Canal emerges from the Seneca River in the Town of Tyre. The Seneca River/Cayuga & Seneca Canal continues southwest where its flows into Cayuga Lake, then Seneca Lake. The Erie Canal continues into the City of Rochester where it intersects with the Genesee River. The EEIP project area extends North from the Erie Canal along the Genesee River until the Court Street Dam in Rochester, while the EEIP project area along the Erie Canal continues west until it reaches the Niagara River. Feeder canals such as the Chenango, Madison, Kingsely Brook, Bradley Brook, Nine Mile Creek, Butternut Creek, Limestone Creek, Forestport, and Glens Falls are primarily man-made but may include sections of natural streams (see **Figure *3.7-1***).

Palustrine systems are non-tidal, perennial wetlands characterized by their emergent vegetation. Common types of palustrine systems that may be found on or adjacent to canal and feeder embankments include shallow emergent marshes, shrub swamps, floodplain forests, and common reed marshes. Shallow emergent marshes are wetlands that are permanently saturated and seasonally flooded. The most abundant herbaceous plants include cattails (*Typha latifolia, T. angustifolia, T. x glauca*), sedges (*Carex spp*.), marsh fern (*Thelypteris palustris*), manna grasses (*Glyceria pallida, G. canadensis*), spikerushes (*Eleocharis palustris, E. obtusa*), bulrushes (*Scirpus*

[44] Edinger, *Ecological Communities of New York State*.

cyperinus, S. atrovirens, Schoenoplectus tabernaemontani), three-way sedge (*Dulichium arundinaceum*), sweetflag (*Acorus americanus*), tall meadow-rue (*Thalictrum pubescens*), marsh St. John's-wort (*Triadenum virginicum*), arrowhead (*Sagittaria latifolia*), goldenrods (*Solidago rugosa, S. gigantea*), spotted joe-pye-weed (*Eutrochium maculatum*), boneset (*Eupatorium perfoliatum*), smartweeds (*Persicaria amphibia, P. hydropiperoides*), marsh bedstraw (*Galium palustre*), jewelweed (*Impatiens capensis*), loosestrifes (*Lysimachia thyrsiflora, L. terrestris, L. ciliata*). Native reed canary grass (*Phalaris arundinacea*) may occur in low abundance in undisturbed marshes, but frequently becomes abundant in disturbed marshes. Bluejoint grass (*Calamagrostis canadensis*) may be common, but it is more characteristic of sedge meadow. Marshes that have been disturbed are frequently invaded by weedy species such as purple loosestrife (*Lythrum salicaria*) and European common reed (*Phragmites australis*). These areas are better classified as purple loosestrife marsh and common reed marsh respectively. Other plants characteristic of shallow emergent marshes (most frequent listed first) include blue flag iris (*Iris versicolor*), sensitive fern (*Onoclea sensibilis*), common skullcap (*Scutellaria galericulata*), begger-ticks (*Bidens spp*.), waterhorehounds (*Lycopus uniflorus, L. americanus*), burreeds (*Sparganium americanum, S. eurycarpum*), swamp milkweed (*Asclepias incarnata*), waterhemlock (*Cicuta bulbifera*), asters (*Doellingeria umbellata var. umbellata, Symphyotrichum puniceum var. puniceum*), marsh bellflower (*Campanula aparinoides*), water purslane (Ludwigia palustris), royal and cinnamon ferns (Osmunda regalis, O. cinnamomea), marsh cinquefoil (Comarum palustre), rushes (Juncus effusus, J. canadensis), arrowleaf (Peltandra virginica), purple-stem angelica (*Angelica atropurpurea*), water docks (*Rumex orbiculatus, R. verticillatus*), turtlehead (*Chelone glabra*), waterparsnip (*Sium suave*), and cardinal flower (*Lobelia cardinalis*). Shallow emergent marshes may have scattered shrubs including speckled alder (*Alnus incana ssp. rugosa*), water-willow (*Decodon verticillatus*), shrubby dogwoods (*Cornus amomum, C. sericea*), willows (*Salix spp.*), meadow-sweet (*Spiraea alba var. latifolia*), and buttonbush (*Cephalanthus occidentalis*). Characteristic mosses include *Calliergonella cuspidata* and *Campylium spp*. Characteristic amphibians that breed in in shallow emergent marshes include frogs such as northern spring peeper (*Pseudacris crucifer*), green frog (*Rana clamitans melanota*), American toad (*Bufo americanus*), and wood frog (*Rana sylvatica*). Characteristic birds with varying abundance include red-winged blackbird (*Agelaius phoeniceus*), marsh wren (*Cistothorus palustris*), swamp sparrow (*Melospiza georgiana*), Virginia rail (*Rallus limicola*), and common yellowthroat (*Geothlypis trichas*). Areas over 50% shrub cover are considered shrub swamps. A marsh that has been previously disturbed or has undergone water quality changes can allow for more tolerant invasive species, such as the European common reed (*Phragmites australis*) and purple loosestrife to become dominant. [45]

Terrestrial systems consist of upland habitats with well-drained soils and include everything except aquatic, wetland, and subterranean communities. Some communities that may be found on or adjacent to canal and feeder embankments include floodplain grasslands, riverside sand/gavel bars, successional old field, successional shrubland, successional norther hardwood,

[45] Edinger, *Ecological Communities of New York State*.

successional southern forest, croplands, and pasturelands. Floodplain grasslands occur along upper reaches of larger confined rivers and are subject to flooding and ice scour. The dominant grasses are big bluestem (*Andropogon gerardii*), Indian grass (*Sorghastrum nutans*), and switch grass (*Panicum virgatum*). Other grasses with lower percent cover include little bluestem (*Schizachyrium scoparium*), reed canary grass (*Phalaris arundinacea*), deer tongue grass *(Dichanthelium clandestinum*), and freshwater cordgrass (*Spartina pectinata*). Other characteristic herbs include goldenrods (*Solidago juncea, S. gigantea, S. rugosa, S. canadensis, S. nemoralis, Euthamia graminifolia*), false indigo (*Baptisia tinctoria*), marsh fern (*Thelypteris palustris*), frostweed (*Helianthemum canadense*), bushclover (*Lespedeza capitata*), starry Solomon's-seal (*Maianthemum stellatum*), American germander (*Teucrium canadense*), spreading dogbane (*Apocynum androsaemifolium*), St. John's-wort (*Hypericum mutilum*), butterflyweed (*Asclepias tuberosa*), hairyfruited sedge (*Carex trichocarpa*), giant St. John'swort (*Hypericum ascyron*), and wool grass (*Scirpus cyperinus*). Scattered young trees may also be present such as the cottonwood (*Populus deltoids*), sycamore (*Platanus occidentalis*), gray dogwood (*Cornus foemina*), river birch (*Betula nigra*), indigo bush (*Amorpha fruticosa*), scrub oak (*Quercus ilicifolia*), pasture rose (*Rosa carolina*), sand cherry (*Prunus pumila var. depressa*), low bush blueberries (*Vaccinium pallidum. V. angustifolium*), black huckleberry (*Gaylussacia baccata*), black locust (*Robinia pseudoacacia*), ninebark (*Physocarpus opulifolius*), meadowsweet (*Spiraea alba var. latifolia*), and staggerbush (*Lyonia ligustrina*). Vines that may be present in the groundlayer include poison ivy (*Toxicodendron radicans*) and Virginia creeper (*Parthenocissus quinquefolia*). Non-native invasive plants that may be found in this community include Japanese knotweed (*Fallopia japonica*), knapweed (*Centaurea stoebe ssp. micranthos*), and Cypress spurge (*Euphorpia cyparissias*).[46] This type of terrestrial system may be found in sections along the Hudson, Mohawk, Oneida, Oswego, and Seneca Rivers. Riverside sand/gravel bars may also be found along these rivers with similar vegetation found in the floodplain grassland community.

[46] Edinger, *Ecological Communities of New York State*.

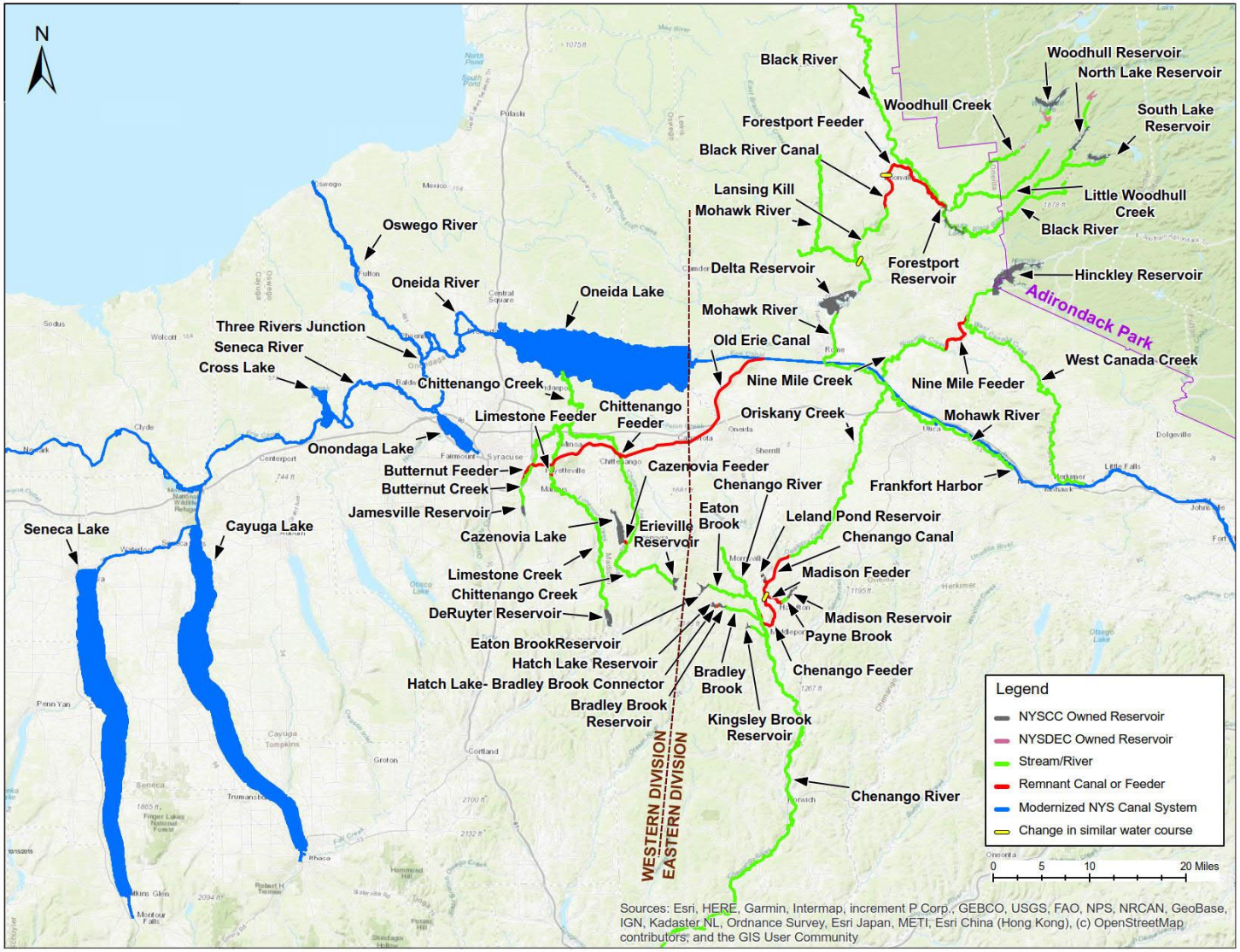

Figure 3.7-1: Canal, Reservoirs and Feeders in Central New York

Successional old fields are very common along the canal systems. This type of community is dominated by forbes and grasses that occur on sites that have been previously cleared, then abandoned or are mowed less than once a year. Characteristic herbs include goldenrods (*Solidago altissima, S. nemoralis, S. rugosa, S. juncea, S. canadensis*, and *Euthamia graminifolia*), bluegrasses (*Poa pratensis, P. compressa*), timothy (*Phleum pratense*), quackgrass (*Elymus repens*), smooth brome (*Bromus inermis*), sweet vernal grass (*Anthoxanthum odoratum*), orchard grass (*Dactylis glomerata*), common chickweed (*Cerastium arvense*), common evening primrose (*Oenothera biennis*), old-field cinquefoil (*Potentilla simplex*), calico aster (*Sympyotrichum lateriflorum var. lateriflorum*), New England aster (*Sympyotrichum novae-angliae*), wild strawberry (*Fragaria virginiana*), Queen-Anne's-lace (*Daucus carota*), ragweed (A*mbrosia artemisiifolia*), hawkweeds (*Hieracium spp*.), dandelion (*Taraxacum officinale*), and ox-tongue (*Picris hieracioides*). Characteristic shrubs include gray dogwood (*Cornus racemosa*), silky dogwood (*C. amomum*), arrowwood (*Viburnum dentatum var. lucidum*), raspberries (*Rubus spp*.), sumac (Rhus typhina, R. glabra), and eastern red cedar (Juniperus virginiana). Characteristic butterflies include black swallowtail (*Papilio polyxenes*), orange sulphur (*Colias eurytheme*), eastern tailed blue (*Everes comyntas*), and copper (*Lycaena phlaeas*). Characteristic birds include field sparrow (*Spizella pusilla*), savannah sparrow (*Passerculus sandwichensis*), and American goldfinch (*Carduelis tristis*). Characteristic mammals include meadow vole (*Microtus pennsylvanicus*) and woodchuck (*Marmota monax*). Successional shrublands are similar to successional old fields except they are dominated by shrub species rather than grasses. They may also contain many non-native shrub species such as hawthornes (*Crataegus spp*.), multiflora rose (*Rosa multiflora*), Russian and autumn olive (*Elaeagnus angustifolia, E. umbellata*), buckthorns (*Rhamnus cathartica, Frangula alnus*), and shubby honeysuckles (*Lonicera tatarica, L. morrowii, L. maacckii*). Characteristic birds with varying abundance include gray catbird (*Dumetella caroliniensis*), brown thrasher (*Toxostoma rufum*), blue-winged warbler (*Vermivora pinus*), golden-winged warbler (*V. chrysotera*), chestnut-sided warbler (*Dendroica pensylvanica*), yellow-breasted chat (*Icteria virens*), eastern towhee (*Pipilo erythrophthalmus*), field sparrow (*Spizella pusilla*), song sparrow (*Melospiza melodia*), and indigo bunting (*Passerina cyanea*).[47]

Hemlock-northern hardwood forests are a common forest type that may be found growing along or adjacent to canal and feeder embankments. In any one stand, eastern hemlock (*Tsuga canadensis*) is codominant with any one to three of the following: sugar maple (*Acer saccharum*), red maple (*A. rubrum*), yellow birch (*Betula alleghaniensis*), black birch (*B. lenta*), red oak (*Quercus rubra*), American beech (*Fagus grandifolia*), white ash (*Fraxinus americana*), chestnut oak (*Quercus montana*), white oak (*Q. alba*), white pine (*Pinus strobus*). Other trees may include hop hornbeam (*Ostrya virginiana*), black cherry (*Prunus serotina*), and basswood (*Tilia americana*). The shrub layer may be sparse and typically includes saplings of canopy trees. Characteristic shrubs are witch hazel (*Hamamelis virginiana*), hobblebush (*Viburnum lantanoides*), maple-leaf viburnum (*Viburnum acerifolium*), lowbush blueberry (*Vaccinium pallidum*), and raspberries (*Rubus spp*.). In some ravines, especially in the southern part of the

[47] Edinger, *Ecological Communities of New York State*.

state, rosebay (*Rhododendron maximum*) forms a dense subcanopy or tall shrub layer. Canopy cover can be quite dense, resulting in low light intensities on the forest floor and hence a relatively sparse groundlayer. Characteristic groundlayer herbs include woodferns (*Dryopteris marginalis, D. intermedia D. campyloptera*), Christmas fern (*Polystichum acrostichoides*), Canada mayflower (*Maianthemum canadense*), white wood aster (*Eurybia divaricata*), sarsaparilla (*Aralia nudicaulis*), partridge berry (*Mitchella repens*), common wood-sorrel (*Oxalis montana*), jack-in-the-pulpit (*Arisaema triphyllum*), star flower (*Trientalis borealis*), lady fern (*Athyrium filix-femina var. asplenioides*), and Pennsylvania sedge (*Carex pensylvanica*). Other plants include Indian cucumber root (*Medeola virginiana*), sessile-leaved bellwort (*Uvularia sessilifolia*), shining fir clubmoss (*Huperzia lucidula*), foamflower (*Tiarella cordifolia*), round-leaf violet (*Viola rotundifolia*), twisted stalk (*Streptopus roseus*), purple trillium (*Trillium erectum*), and white cushion moss (*Leucobryum glaucum*). In forests that have American beech as a codominant tree, beech-drops (*Epifagus virginiana*) is a common herb. Indian-pipe (*Monotropa uniflora*) and American pinesap (*M. hypopithys*) are occasionally found in low light examples. Hay-scented fern (*Dennstaedtia punctilobula*) and New York fern (*Thelypteris noveboracensis*) may be common in canopy gaps. Birds frequently found in hemlock forests include Acadian flycatcher (*Empidonax virescens*), blue-headed vireo (*Vireo solitarius*), black-throated green warbler (*Dendroica virens*), and Blackburnian warbler (*Dendroica fusca*).[48]

Successional northern and southern hardwoods are a terrestrial community type that has developed after the land has been cleared. Characteristic trees and shrubs of the successional northern hardwood forest include quaking aspen (*Populus tremuloides*), big-tooth aspen (*P. grandidentata*), balsam poplar (*P. balsamifera*), paper birch (*Betula papyrifera*), gray birch (*B. populifolia*), pin cherryn (*Prunus pensylvanica*), black cherry (*P. serotina*), red maple (*Acer rubrum*), white pine (*Pinus strobus*), with lesser amounts of white ash (*Fraxinus americana*), green ash (*F. pennsylvanica*), and American elm (*Ulmus americana*). Characteristic trees and shrubs for successional southern hardwood forests include American elm (*Ulmus americana*), slippery elm (*Ulmus rubra*), white ash (*Fraxinus americana*), red maple (*Acer rubrum*), box elders (*Acer negundo*), silver maple (*Acersaccharinum*), sassafrass (*Sassafras albidum*), gray birch *(Betula populifolia*), hawthorn (*Crataegus spp.*), eastern red cedar (*Juniperus virginiana*), and choke-cherry (*Prunus virginiana*). Certain introduced species are commonly found in successional forests, including black locust (*Robinia pseudo-acacia*), tree-of-heaven (*Ailanthus altissima*), and buckthorn (*Rhamnus cathartica*).[49]

Rare, Threatened or Endangered Species

The NYSDEC *SEQR Workbook* notes that threatened and endangered species are protected by both state and federal laws. New York State also classifies certain animal species as Special

[48] Edinger, *Ecological Communities of New York State*.
[49] Edinger, *Ecological Communities of New York State*.

Concern and certain rare plant species as Rare. The Natural Heritage Program ranks rare animals and rare plants, including endangered and threatened species.

Some areas of the canal system are located in areas where state or federally listed rare, threatened or endangered (RTE) species are known to exist or have potential for sufficient habitat. Prior to the commencement of any maintenance activity that would require permit authorization or approval by a state or federal agency, qualified personnel would evaluate the project area for the potential for RTE species and, if necessary, consult with U.S. Fish and Wildlife Service (USFWS) and/or NYSDEC Natural Heritage Program. If a review for a specific area is more than 12 months old, a new review would be conducted to ensure updated information.

A review of the USFWS Information for Planning and Conservation (IPaC) website[50] may be used to determine if further consultation with USFWS is required.

Additionally, a review of the NYSDEC's Environmental Resource Mapper (ERM) website[51] may be used to determine if there is a potential to encounter state-listed species. If the ERM indicates that there are no species listed, no further review for state-listed species is needed. If the ERM indicates that there are species, further inquiry would be made of the NYSDEC Natural Heritage Program database, which is accessible to the NYSCC.

Tables 2 and 3, in Section 8 of the *Guide Book*, provide examples of the federal- and state-listed species that may be encountered in progressing the EEIP in a particular segment of canal or feeder embankment.[52] The NYSCC has access to maps providing the locations of RTE species, communities, and resources. A majority of all EEIP project areas are within the 5-mile federal/state buffer of Threatened and Endangered Species. Other sensitive areas provided in these maps are National Wildlife Refuges, NYSDEC Lands, and NYSDEC Significant Natural Communities. **Table *3.7-1*** lists the counties where these sensitive areas and canal embankments intersect.

The Montezuma Wildlife Refuge is the only national wildlife refuge through which the canal passes. The canal enters the Montezuma Wildlife Refuge at the southeast end of the Town of Savannah. The project area then continues through the wildlife refuge in the Town of Tyre where the canal splits in two, leading a portion of canal to Cayuga and Seneca Lake. The canal property remains within the wildlife refuge as it extends through northeast corner of the Town of Seneca Falls. The other section of canal remains in the wildlife refuge until it extends through the southeast corner of the Town of Galen.

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50 "IPaC," U.S. Fish and Wildlife Service, accessed December 1, 2020, http://ecos.fws.gov/ipac/.

51 "Environmental Resource Mapper," New York State Department of Environmental Conservation, accessed December 1, 2020, http://www.dec.ny.gov/gis/erm/.

52 It is understood that the listings of protected species is subject to change over time, so the referenced tables may include species that are no longer listed, or may be missing some that are now listed. The locations where these species may be found are also updated as new information becomes available.

A NYSDEC website points out that the Montezuma area is situated in the middle of one of the busiest bird migration routes on the Atlantic Flyway. More than 240 species of birds can be found on the refuge, along with 43 species of mammals,15 species of reptiles, and 16 species of amphibians.[53]

Table 3.7-1: Counties Where Sensitive Environmental Areas and Canal or Feeder Embankments Intersect

Sensitive Environmental Area Type	County Containing Project Area and Sensitive Environmental Area
National Wildlife Refuge	Cayuga, Seneca, Wayne
NYSDEC Lands	Herkimer, Oneida, Cayuga, Wayne, Monroe
NYSDEC Significant Natural Communities	Montgomery, Herkimer, Cayuga, Seneca, Wayne
Threatened & Endangered Species 5-Mile Buffer (Federal/State)	Washington, Warren, Saratoga, Rensselaer, Albany, Saratoga, Schenectady, Montgomery, Oneida, Madison, Oswego, Onondaga, Cayuga, Seneca, Wayne, Ontario, Monroe, Orleans

Invasive Species

The NYSDEC describes an "invasive species" as a species that is non-native to the ecosystem under consideration; and whose introduction causes or is likely to cause economic or environmental harm or harm to human health. From an ecological standpoint, invasive plants can have negative impacts on the native biodiversity of an area. In many cases, invasive plants outcompete native plants leading to the displacement of native plants that wildlife may depend on for food and habitat.

The control of invasive species is addressed in Presidential Executive Order 13112 and New York State Environmental Conservation Law Article 9, Title 17. Agencies are required to prevent the introduction and spread of invasive species, as well as provide for their control, where

[53] "Montezuma Wetlands Complex," New York State Department of Environmental Conservation, accessed December 1, 2020, https://www.dec.ny.gov/outdoor/55687.html.

practicable. The management practices used by NYSCC to prevent the spread of invasive species during EEIP activities are discussed in Section 8.5 of the *Guide Book*. These practices include proper cleaning and disposal of contaminated equipment.

It is likely that invasive species will be encountered on and/or adjacent to canal earthen embankments. A full list of Prohibited and Regulated Invasive Species can be found in NYCRR Part 575 or on NYSDEC's website.[54] Section 8.5 of the *Guide Book* also provides a list of invasive species that may commonly be encountered on canal and feeder embankments. Some of these species, such as Japanese Knotweed, can spread very aggressively and can be extremely difficult to eradicate and control.

Habitat Corridors

A spatial view of New York State shows a mosaic of commercial, industrial, residential, agricultural, and natural areas. Natural areas of undeveloped land provide habitat for wildlife. However, the quality of habitat is reduced when land becomes isolated and discontinued due to human development. This process is known as habitat fragmentation and is an issue of concern for many areas in New York State. The canal system and its adjacent lands can improve landscape connectivity by linking patches of viable habitat that would otherwise be fragmented. In this way the canal system can become a habitat corridor. Corridors can be defined as landscape structures that enhance the dispersal of organisms between suitable habitat patches in fragmented landscapes where isolates of suitable habitat are surrounded by a matrix of inhospitable habitat types.[55]

Many species of ground-dwelling mammals, amphibians, reptiles, and nonflying insects, as well as some flying species such as butterflies, forest birds, and bats, depend to some extent on forested landscapes for dispersal. Dispersal is the movement of species that provides a potential for genetic mixing.[56] Without a connecting habitat an individual population of species would become isolated, preventing genetic mixing within that population and making them more vulnerable to disease.

Some plant species, living among fragmented habitats, indirectly depend on animals for seed dispersal. Seed dispersal is an important process in which plants species spread and establish new populations. Plants have developed adaptations that use animals as dispersal agents. Such adaptations include the development of seeds with hooks or burrs that can attach to an animal's fur or feathers. Examples of plant species that use hooks or burrs to disperse their seeds include the Canada thistle (*Cirsium arvense*), Enchanter's Nightshade (*Circaea lutetiana*), and Queen Anne's lace (*Daucus carota*). Another method in which plants use to spread their seeds is

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54 "Invasive Species Regulations," New York State Department of Environmental Conservation, accessed December 1, 2020, https://www.dec.ny.gov/animals/99141.html.

55 Vos, 2002.

56 Edelsparre, 2018.

through animal ingestion. Many species of plants produce fruits containing seeds that are eaten by animals and eventually deposited in their feces. Plants that produce berries, such as the Black huckleberry (*Gaylussacia baccata*) and Wild Red Raspberry (*Rubus ideaeus*), are examples of species that depend on animal ingestion for seed dispersal. The presence of wildlife corridors is important to plant species that rely on animal movement, especially in areas with high amounts of habitat fragmentation. Habitat corridors promote the movement of animals and, therefore, increase opportunities for seed dispersal.

3.7.2 Potential Impacts of Proposed Action

Direct Impacts

Rare, Threatened and Endangered (RTE) Species

The NYSDEC works with the New York Natural Heritage Program (NHP) to map verified reports of RTE species and provide screening tools for both the public and NYSDEC staff to identify areas where listed species are known to occur. NYSCC's trained staff have direct access to this database to identify whether any listed species may be present within each proposed project area.

If the screening indicates the potential for RTE to be present in the activity area, then the Director of Environmental, Health & Safety will contact the applicable NYSDEC Regional Division Environmental Permits for consultation. The consultation may include the appropriate habitat survey(s) to determine the presence of RTE species and identify the appropriate protocols.

Once habitat is verified to be occupied by a protected species, the location will be assumed to remain occupied unless the habitat is no longer suitable and timely surveys confirm that the species is no longer present. No incidental take permit would be required if appropriate surveys confirm that the species is no longer present in the habitat.

Direct impacts on plants and animals have the potential to occur as a result of vegetation altering activities contemplated under the EEIP. Direct impacts to RTE species are organized into two distinct classes: those that require an incidental take permit and those that do not.

When a project proponent cannot fully avoid adverse impacts to listed species, the regulations regarding issuing a permit under 6 NYCRR Part 182 come into play. The NYSDEC refers to "listed species" as threatened or endangered animal species.[57] ~~The NYSDEC refers to "listed species" as both State and Federal Threatened or Endangered species.~~ The regulations require an incidental take permit for any taking of threatened or endangered animal species. It should be noted that listed plants and species of special concern are not subject to these regulations.

[57] All federally listed species are also state listed species.

The NYSDEC's authority to regulate activities involving the taking of threatened or endangered species is based upon appellate court decisions that have ruled that the term "take," as used in the State's Endangered Species Act, includes adverse modification of the occupied habitat of protected species. The term "occupied habitat" is defined as "a geographic area in New York within which a species listed as endangered or threatened is in this Part has been determined by the department to exhibit one or more essential behaviors." Examples of essential behaviors include:

- breeding
- hibernation
- reproduction
- feeding
- sheltering
- migration
- movement
- overwintering

~~The NYSDEC works with the New York Natural Heritage Program (NHP) to map verified reports and provide screening tools for both the public and NYSDEC staff to identify areas where listed species are known to occur. NYSCC has direct access to NHP's database. NYSCC would search the specified project area within the database to determine if any listed species may be present there. If the database indicates the project site may contain habitat occupied by a protected species, the location will be assumed to remain occupied unless the habitat is no longer suitable and there have been recent surveys confirming that the species is no longer present. No incidental take permit would be required if appropriate surveys confirm that the species is no longer present in the habitat.~~

Loss of Woody Vegetation

Section 7.3 of the *Guide Book* states that for embankment maintenance, there are two general categories of vegetation cover: compatible and non-compatible. Compatible vegetation includes grasses and other similar plant cover that is low growing, easy to mow, and has a shallow root system. Non-compatible vegetation includes most brush, bushes, and trees. This type of vegetation develops deeper root-systems and can be prevented by regular mowing. Compatible vegetation on earthen embankments is essential for maintaining public safety. Trees and other deep-rooted vegetation can cause many problems such as preventing effective inspections and monitoring of embankments and causing structural damage via embankment piping and internal erosion.

As discussed in the *Guide Book*, woody vegetation with robust root systems can disturb the soil structure in the embankment. Roots that penetrate the phreatic surface in the embankment increase the risk of internal erosion known as piping, the early stages of which can go

undetected for decades resulting in a sudden failure of an earthen embankment. Animal burrows pose a similar piping potential. The animal burrow shortens the seepage path potentially leading to piping at the burrow location. Furthermore, large trees can be uprooted by winds/erosion and leave large holes in the embankment, root systems can decay and rot creating passageways for water through the embankment. Once a significant seepage pathway is initiated, catastrophic embankment failure could be expected to occur within one to two hours. The presence of brush and trees can also hinder critical emergency responses to flooding or repair operations.

The removal of non-compatible vegetation along earthen embankments is supported by the USACE. A key aspect of their guidance on this topic is to establish a vegetation-free zone which is a "three-dimensional corridor surrounding all levees, floodwalls, embankment dams, and critical appurtenant structures in all flood damage reduction systems." No vegetation, other than approved grasses may penetrate the vegetation-free zone. The primary purpose of the vegetation-free zone is to "provide a reliable corridor of access to, and along, levees, floodwalls, embankment dams, and appurtenant structures." References calling for the removal of non-compatible vegetation along earthen embankments is provided in:

- NYSDEC Owners Guidance Manual for the Inspection and Maintenance of Dams in New York State *[NYSDEC, 1987* ~~originally published in June 1989~~
- FEMA 534, Technical Manual for Dam Owners Impacts of Plants on Earthen Dams *[FEMA, 2005]*; and
- USACE ETL 1110-2-583, Guidelines for Landscape Planting and Vegetation Management at Levees, Floodwalls, Embankment Dams, and Appurtenant Structures, *[USACE, 2014]*.

According to the *Guide Book*, ~~all~~ non-compatible vegetation must be removed from ~~Zones 1, 2A, 4 and 5 of~~ the embankments at least to the NYSCC-owned property line (see **Figure *3.2-2***) ~~.~~ ~~Some non-compatible vegetation may be allowed in Zones 2B provided there is a planting berm and 3~~ in accordance with Section ~~8~~7.3.2 of the *Guide Book* and Section 3.9 of this GEIS.

The FEMA document, in addition to espousing that woody growth should be prevented on dams and embankments in the first place, provides good information on the considerations and general processes to follow in order to remove woody vegetation once established. The location of the woody vegetation on the embankment (see **Figure *3.2-2***) dictates different methods of removal. Due to the general characteristics of seepage through the embankment, each zone of the embankment has somewhat different characteristics. Therefore, the criticality of the removal procedures and the extent of removal required varies by zone (e.g. requiring removal of the entire root system or just the portion above ground). One of the major concerns with tree and brush cover is the potential for a piping failure. Those zones that intersect the phreatic surface

of the water within the embankment are the most critical with respect to maintenance and removal techniques.

Establishing turf grass on embankment Zones 1–5 is an important aspect of embankment maintenance. Turf grass would be established after all non-compatible vegetation is removed to help reduce erosion of embankment slopes, reduce the influx of unwanted vegetation, and prevent the establishment of invasive species populations. Mowing of turf grass, after it is fully established, would take place at least twice per year or as required to maintain a desired maximum 12-inch height. For more detail about the process of establishing turf grass and mowing operations, see Best Management Practices attached to the *Guide Book* in Appendix A under "Establishing Turf Grass" and "Mowing."

The removal of woody vegetation along embankments and the establishment of turf grass may cause a loss of species richness. Species richness is defined as the number of different species identified in a given area or habitat.[58] Turf grass does not provide suitable habitat to many woodland animals such as songbirds, hawks, owls, wild turkeys, gray squirrels, northern flying squirrels, chipmunks, white-tailed deer, red fox, and gray fox, since they rely on trees and other woody vegetation for protection from predators and as a source of food.

Some wildlife species, such as woodchucks (groundhogs) and muskrats, are more tolerant to human disturbance than other species. Embankments along the canal system provide suitable habitat for these types of rodents. However, their burrowing activities can lead to serious structural damages to the canal system and costly repairs by creating voids and pathways for intruding water to accelerate erosion as discussed in the *Guide Book*. Identifying, controlling, and repairing rodent burrows is an important part of maintaining the structural stability of embankments. Part of the rodent control process would involve removing the rodent from that area. NYSCC has an agreement with the USDA Animal and Plant Health Inspection Service (APHIS) Wildlife Service (WS) for assistance with control of the rodent population along the canal and feeder embankments. All trapping, relocating and population control measures would be undertaken by APHIS and not NYSCC directly. After the rodent is removed, the burrow would be filled with material depending on its size and location on the embankment in accordance with the *Guide Book*.

Although the proposed action would cause loss of existing woody vegetation, the width of woody vegetation cover planned for removal would be less than 200 feet wide in most locations. Furthermore, in most locations this level of woody vegetation removal would not occur for miles of embankment at one time, but rather in dis-contiguous sections of priority areas at a time. The removal would occur in segments over years of time.[59]

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[58] Kiester, 2013.

[59] Segments of embankment are identified and prioritized by risk as presented in Appendix B. Due to topography, the location of embankments is not always continuous. Also, funding for vegetation

Besides woody vegetation, there are places where wetland vegetation is growing on or along embankments in areas where seeps are present. However, the presence of seeps, while often supporting wetland vegetation, is an indication of problems with the earthen structure of the embankment that require correction.

Wildlife that may be displaced by the removal of woody vegetation would most likely move to any suitable habitat adjacent to the canal and feeder embankments since most animals instinctively make decisions that maximize their lifetime reproductive output.[60]

Land Cover Changes

Section 1.3.2 identifies approximately 130 miles of earthen embankments to provide an illustration of earthen embankments in the project area, and the potential for environmental impacts on land cover of maintaining earthen embankments. A desktop analysis was performed to categorize the surface cover of those earthen embankments and Geographic Information Systems (GIS) software (ArcMAP from ESRI) was utilized to complete this analysis.

The first step in the methodology was to obtain the source data to use to define embankment shapes and land types. Information pertaining to land ownership and the location and lengths of the embankments, based on Section 1.3 of this GEIS and Section 6 of the *Guide Book*, were inputted into a GIS database. Elevation data and aerial imagery was also obtained from publicly available datasets at GIS.NY.GOV.

After the data sources were compiled, polygons representing embankment shapes were created. The boundary line for the embankment polygons extended from the canal to approximately 15 feet downslope of the embankment toe. The toe of each embankment was identified using topography datasets for each county. If the boundary line was determined to be outside of canal-owned lands or if the toe was not easily identified, then the NYSCC property line was used for the embankment boundary.

Once the embankment shapes were defined, land types within each embankment were categorized into four distinct groups. The categorizations were completed by visually inspecting aerial imagery which had been downloaded from publicly available datasets on GIS.NY.GOV. The dates of the aerial imagery ranged from 2015 through 2018 depending on the county. Polygons representing each type of land cover were manually created within the embankment shapes based on the visual inspection of the imagery. The criteria for what constituted each land category is summarized below:

- Grass - manicured or highly mowed area (residential lawns or similar in nature)

removal from earthen embankments is allocated annually. For these reasons, long, continuous stretches of vegetation removal is not anticipated to be a common EEIP activity.

[60] Delibes, 2009.

- Forest - over 50% tree cover
- Brush - unmanicured, less than 50% tree cover
- Gravel - paved, roads, buildings and other impervious surfaces

The visual analysis using aerial imagery was applied consistently over the 130 miles of embankment studied. After each embankment had been visually inspected and categorized, the areas were tabulated and compiled by county.

Table *3.7-2* shows the lengths of the embankments identified by county, and the total acreage for each land cover type on a county basis that resulted.

Table 3.7-2: Existing Land Cover for 130 Miles of Identified Earthen Embankment

County	Embankment Lengths (miles)	Existing Land Cover (acres)					Acres per mile
		Gravel	Grass	Brush	Forest	Total	
Herkimer	13.9	11.9	12.4	55.9	258.4	338.6	4.9
Madison	6.2	2.4	15.4	1.8	27.3	46.9	0.7
Monroe	23.4	42.8	39.3	65.0	99.4	246.5	2.5
Montgomery	8.5	23.7	7.5	37.3	123.8	202.3	1.7
Niagara	17.0	24.0	34.1	31.3	54.8	144.2	2.6
Oneida	10.6	10.7	27.4	24.8	160.2	223.1	1.4
Onondaga	8.8	10.2	11.2	9.3	36.4	67.1	0.5
Orleans	26.9	45.3	69.0	41.1	73.8	229.2	3.8
Oswego	1.2	0.0	3.7	2.2	5.8	11.7	0.1
Warren	4.1	4.8	5.1	1.1	5.7	16.7	1.8
Washington	0.4	0.2	0.7	0.1	1.4	2.4	0.01
Wayne	9.3	12.9	14.8	61.4	78.9	168.0	1.9
Total	**130.3**	**198.9**	**240.6**	**331.3**	**925.9**	**1,696.7**	
Average	**10.9**	**16.6**	**20.1**	**27.6**	**77.2**	**141.4**	**1.6**
Percent		**11.7**	**14.2**	**19.5**	**54.7**	**100.0**	

The acres per mile of earthen embankments is provided in the far-right column of **Table *3.7-2***. It ranges from 4.1 acres per mile in Warren County to 24.8 in Montgomery County, with an overall average of 13.1 acres per mile. This provides an indication of the relative size or extent of the embankments studied.

Once the existing land cover was estimated, the land cover resulting from the application of the EEIP was tabulated. Determination of the final land cover is a process that will take into account many variables, including the geometry, location and condition of the existing earthen embankment. The geometry would consider the steepness of the slope, amount of property under the jurisdiction of the NYSCC beyond the existing toe of slope, the width of the embankment and parameters. The location may include the location of the embankment relative to other resources, such as parks (Section 3.11), scenic resources (Section 3.9) and potential

habitat for Rare, Threatened or Endangered species. The condition may include the extent of tree and other vegetative growth on the embankment, and the extent of any existing embankment seepage. This analysis does not take into account the fact that some vegetation in Zones 2B and 3 or on projects where thresholds are exceeded, may remain as discussed in Section 3.9.4.

This analysis was very conservative in that it did not take into consideration any of variables, including the geometry, location and condition of the existing earthen embankment, but instead assumed that all land covered in brush and all land covered in forest would be converted to cover allowed in the EEIP. All earthen embankments would be covered with some sort of vegetation. The types of vegetation are presented in the Best Management Practices (BMPs) found as Attachment 1 to the *Guide Book* (Appendix A). Vegetative cover includes turf grass, vegetative screening plantings and pollinator plantings.

Table *3.7-3* shows the results of the land cover analysis. It indicates that up to 1,257.2 acres of embankment cover may be converted from brush and forest cover to a mixture of turf grass, vegetative screening plantings and pollinators, with occasional trees/woody vegetation in Zones 2B and 3 or on projects where thresholds are exceeded. This represents approximately 74 percent of the 130 miles of earthen embankment. The 130 miles of earthen embankment is approximately 12 percent of the project area (the modernized NYS Canal System and numerous systems of remnant canals and feeders) as shown on Table 1.3-1.

Table 3.7-3: Projected Land Cover Following Application of EEIP

County	Projected Land Cover (acres)					
	Gravel	Grass	Brush*	Forest*	EEIP Cover	Total
Herkimer	11.9	12.4	0.0	0.0	214.3	338.6
Madison	2.4	15.4	0.0	0.0	29.1	46.9
Monroe	42.8	39.2	0.0	0.0	164.4	246.5
Montgomery	33.7	7.5	0.0	0.0	161.1	202.3
Niagara	24.0	34.1	0.0	0.0	86.1	144.2
Oneida	10.7	27.4	0.0	0.0	185.0	223.1
Onondaga	10.2	11.2	0.0	0.0	45.7	67.1
Orleans	45.3	69.0	0.0	0.0	114.9	229.2
Oswego	0.0	3.7	0.0	0.0	8.0	11.7
Warren	4.8	5.1	0.0	0.0	6.8	16.7
Washington	0.2	0.7	0.0	0.0	1.5	2.4
Wayne	12.9	14.8	0.0	0.0	140.3	168.0
Total	**198.9**	**240.6**	**0.0**	**0.0**	**1,257.2**	**1,696.7**
Average	**16.0**	**20.3**	**0.0**	**0.0**	**104.8**	
Percent	**11.6**	**14.1**	**0.0**	**0.0**	**74.1**	**100.0**

*Brush and Forest in Zone 2 may be salvaged (Assumed to be small percentage)

In order to provide context to the potential loss of brush and forest cover, the amounts of brush and forest cover were compared with the amounts of brush and forest cover in each county. The amounts of cover for each county were obtained from National Land Cover Database (NLCD), which is produced by the Multi-Resolution Land Characteristics (MRLC) Consortium.[61] Land cover classification of "Shrub/Scrub" used in the NLCD was taken as the equivalent of "Brush" as used in this analysis. The NLCD land cover classifications used for "Forest" included a combination of "Deciduous Forest," "Evergreen Forest," "Mixed Forest," and "Woody Wetlands." The results of this comparison are shown on **Table *3.7-4***. This analysis indicates that the loss of brush is about 0.12 percent of all the brush in those counties where there are earthen embankments, and the loss of forest is 0.002 percent of the forest cover in those counties.

Table 3.7-4: Conversion of Brush and Forest

County	Brush in Embank-ment (Acres)	Brush in County (Acres)*	Percent	Forest in Embank-ment (Acres)	Forest in County (Acres)*	Percent
Herkimer	55.9	5,482	1.02	258.4	718,380	0.04
Madison	1.8	4,754	0.04	27.3	221,464	0.01
Monroe	64.6	1,349	4.82	99.4	123,885	0.08
Montgomery	45.4	1,123	3.32	123.8	98,661	0.13
Niagara	32.1	840	3.73	54.8	103,657	0.05
Oneida	25.3	9,370	0.26	160.2	480,848	0.03
Onondaga	9.3	7,310	0.13	36.4	205,851	0.02
Orleans	41.1	347	11.84	73.8	83,966	0.09
Oswego	2.2	8,822	0.02	5.8	8,822	0.07
Warren	1.1	3,715	0.03	5.7	501,271	0.001
Washington	1.0	3,313	0.00	1.4	331,654	0.0004
Wayne	61.4	1,377	4.46	78.9	171,475	0.05
	331.3	**254,444**	**0.13**	**925.9**	**19,523,561**	**0.005**

* Based on data from the Multi-Resolution Land Characteristics (MRLC) Consortium.

This provides an indication of the shift in the local area of habitat types that would result from implantation of the EEIP over a long duration, as all embankments would not be converted at

[61] The MRLC (www.mrlc.gov) is a group of federal agencies who coordinate and generate consistent and relevant land cover information at the national scale for a wide variety of environmental, land management, and modeling applications. The creation of this consortium has resulted in the mapping of the lower 48 United States, Hawaii, Alaska and Puerto Rico into a comprehensive land cover product termed, the National Land Cover Database (NLCD), from decadal Landsat satellite imagery and other supplementary datasets. The primary objective of the MRLC NLCD is to provide the Nation with nationally complete, current, consistent, and public domain information on the Nation's land cover.

one time. In viewing this on a county level, the analysis indicates that the change represents a very small shift in the cover types. Species suited to both brush and forest cover would still find habitat in the surrounding area.

A summary showing the relative magnitude of affected land cover in relation to each county is shown on **Table *3.7-5***. The total of 1,257 acres of embankment affected would be and average of 0.041 percent of the combined brush and forest land cover in the counties.

Table 3.7-5: Combined Conversion of Brush and Forest

County	EEIP Cover (Brush & Forest) (Acres)	Brush & Forest in County (Acres)	Percent
Herkimer	314.30	723,862	0.043
Madison	29.10	226,218	0.013
Monroe	164.40	125,234	0.131
Montgomery	161.10	99,784	0.161
Niagara	86.10	104,497	0.082
Oneida	185.00	490,218	0.038
Onondaga	45.70	213,161	0.021
Orleans	114.90	84,313	0.136
Oswego	8.00	17,644	0.045
Warren	6.80	504,986	0.001
Washington	1.50	334,967	0.000
Wayne	140.30	172,852	0.081
	1,257	**3,097,736**	**0.041**

Wildlife Corridors and Habitat Corridor Fragmentation

There is land adjacent to the canal that has been intensely developed for industrial, commercial, and residential purposes. The high levels of human activity adjacent to the canal system in such areas have already removed or altered much of the potential habitat along embankments as unsuitable for disturbance-sensitive species. Therefore, removal of trees and brush along embankments would not have any significant effects on wildlife in areas along the canal where the surrounding landscape is heavily developed due to human activities and lacks lands that can be considered as suitable habitat for plants and animals of any species.

In areas along the canal system where the adjacent landscape is primarily composed of quality undisturbed land, the overall loss of habitat due to the removal of woody vegetation along embankments would be negligible. In this case, wildlife would not be significantly affected due to the vast availability of other habitat adjacent to the embankments.

Another ecological issue caused by the removal of non-compatible vegetation from embankments is the reduction of a forested landscape that could be part of a wildlife corridor.

The concept of wildlife corridors and habitat fragmentation has been discussed in Section 3.7.1. Decreasing the width of a forested landscape used as a wildlife corridor may deter species from using it to move into new patches of suitable habitat. Potential habitat corridors may also be eliminated due to the removal of non-compatible vegetation. If a wildlife corridor were to be eliminated, it could prevent species from dispersing and finding new potential mates; therefore, reducing a species' genetic diversity. In other areas, it could divert species into adjacent areas where they are less compatible, such as the movement of deer into residential areas.

The removal of trees and shrubs due to EEIP maintenance activities would have the most significant effect on wildlife in rural areas with patches of quality forested land dispersed among large plots of agricultural land. An example of this situation is in **Figure *3.7-2***, in which three large areas of forested landscape are almost surrounded by agricultural fields. In this case, canal embankments provide a wildlife corridor between the three areas of forested land. If these embankments in this situation were to be removed or reduced due to EEIP activities, certain wildlife species may no longer use it as a wildlife corridor, causing the potential effects of isolating individual populations of species and reducing the dispersal of wildlife as discussed previously.

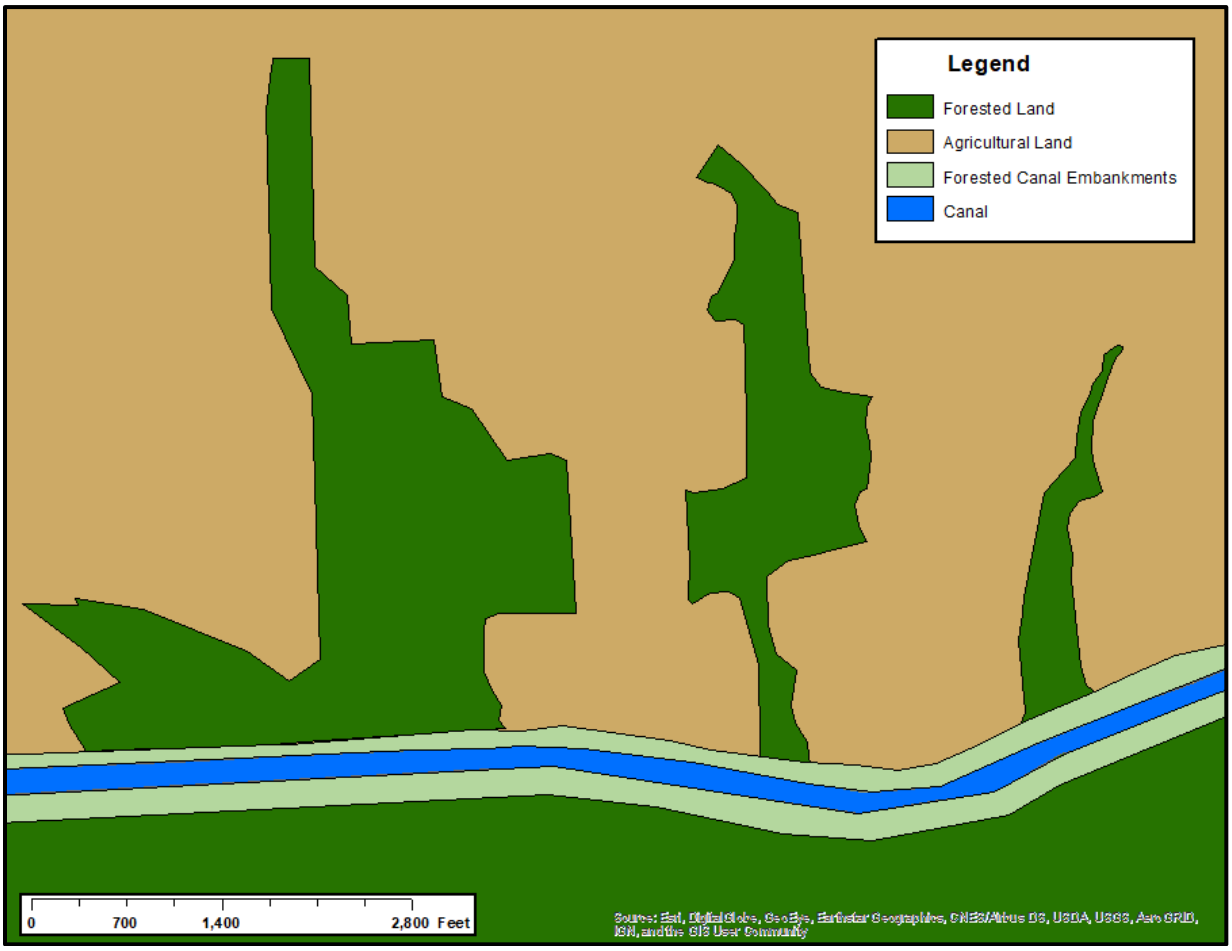

Figure 3.7-2: Forested Canal Embankments as Potential Habitat Corridor

In the larger scope of EEIP activities and the project area, in most places the removal of a section of habitat corridor would not be a significant adverse impact. The affected wildlife species are mobile and will find the other habitat for movement.

Pesticides

As a result of the review of the proposed action in Section 3.4, it has been concluded that there would be no significant impacts involving the use of pesticides. Applying pesticides can be an effective way of killing or suppressing the growth of undesirable and invasive plant species. Pesticides would continue to be used and applied to the manufacturer's specifications by certified applicators on a case-by-case basis to remove invasive plant species and other undesirable vegetation. Japanese Knotweed is an invasive species commonly found along canal and feeder embankments in which NYSCC may apply pesticides.

To protect wildlife, pesticide use on National Wildlife Refuges must be in compliance with FIFRA and other federal laws and authorities including the National Environmental Policy Act, the

Endangered Species Act, Migratory Bird Treaty Act, and the National Historic Preservation Act, state pesticide laws, and label instructions. The use of pesticides on refuges is governed by the U.S. Department of Interior Integrated Pest Management Policy (517 DM 1), the USFWS Pest Management Policy and Responsibilities (30 AM 12), and the USFWS Refuge Manual (7 RM 14) (U.S. Fish and Wildlife Service).

In some cases, pesticides may be applied in the removal/control process. For more information on the Japanese Knotweed management, refer to Best Management Practices attached to the *Guide Book* under "Control/Removal/Disposal of Japanese Knotweed." Although NYSCC would remove all non-compatible vegetation, including invasive species, on zones of the embankment previously discussed, NYSCC would not attempt to control smaller populations of a larger contiguous infestation. Qualified personnel would be consulted to determine the extent of an infestation and recommend Best Management Practices, if necessary.

Indirect Impacts

Indirect impacts of the proposed action due to the loss of existing vegetation would involve the displacement of some existing animal species, due to loss of habitat. After the initial disruption, the longer-term effects would diminish as those species would migrate to locations with suitable habitat to support the species. In addition, new habitat would be created, particularly in Zones 2B and 3 of the embankments, that would serve to attract particular species that are amenable to the changed habitat.

Indirect impacts caused by the removal of trees and shrubs along embankments would include the potential decrease in seed dispersal opportunities for plant species that rely on animal movement to spread their populations.

In most sections of embankment, the water side of the embankment (Zones 1 and 2A) have been maintained to be free of woody vegetation. However, in some sections of the canal, the vegetation growing along canal and feeder embankments provides shade over the water within the canal. It has been shown that along natural streams, the indirect impacts of tree removal may cause a shift in aquatic life to species that can tolerate warmer water temperatures than before. The removal of this vegetation may cause the canal to slightly increase in temperature since more sunlight would be reaching the water surface, or more importantly, the canal bank just below the water level. The increase in water temperature would be higher during the summer months. Water temperatures in the canal are already extremely warm during the summer months. Water temperatures in the canal were collected in several locations including Medina, Eagle Harbor, Albion, and Holley during July and August of 2020. The measured temperatures during these months averaged approximately 78°F. The water temperatures measured indicate that the fish currently inhabiting the canal must already be tolerant of warm water temperatures. These warmwater fish species are listed in Section 3.7.1. Warmwater species are far more tolerant of warmer temperatures than cold-water species such as trout. This topic is further discussed in Section 3.4.

Cumulative Impacts

Besides the potential for direct and indirect impacts to plants and animals in the project area, there are other past and reasonably foreseeable actions that are causing impacts to plants and animals in and adjacent to the project area, putting pressure on habitat areas. Such actions include commercial, industrial and residential developments, along with agriculture and public infrastructure (including roads, railroads and utility corridors). These actions have occurred in the past, continue in the present and will be present in the future. Past actions include construction of the canal system itself, with the wholesale removal of vegetation for excavation of the canal and construction of the earthen embankments. Specific embankment restoration projects are generally accomplished in dis-contiguous segments. There is potential for different segments to impact the same adjacent plants and animals. The cumulative impact would then be the sum of all of the impacts to that that resource from the various segments. EEIP activities accomplished at various times in the future on the same resources would also add together to arrive at the cumulative impacts.

Conclusion

If any ~~uncommon direct~~ impacts to RTE species would take place due to EEIP activities, as set forth in Section 8 of the *Guide Book*, the proposed ~~maintenance~~ activity ~~within the area in which these impacts would take place~~ would not occur until such impacts are fully identified, evaluated, mitigation measures are developed, and all required permits are obtained. Significant impacts may move the activity into alternative engineering solutions and that specific EEIP activity and alternative engineering solution may be evaluated as a separate project under SEQR.

EEIP activities would result in habitat loss for some wildlife. The degree in which wildlife would be affected by the loss of habitat along embankments depends on the surrounding landscapes. Removal of woody vegetation along canal and feeder embankments would result in impacts to wildlife in areas with high levels of habitat fragmentation since the forested embankments could be a potential wildlife corridor. The effects of wildlife corridor fragmentation include reduced animal movement to new patches of habitat, potentially reducing the opportunities for animal species to find new mates. Reducing animal movement would also decrease the number of the opportunities for seed dispersal for plant species that use animals as seed dispersal agents.

There would be minimal impact on wildlife areas with ~~substantial~~ undisturbed habitat adjacent to embankments. The removal of vegetation along embankments located in areas that are intensely developed for commercial, industrial, and residential purposes would also not have a significant impact on wildlife since many species would not inhabit embankments under those conditions.

Burrowing rodents would also be removed from embankments as part of the EEIP causing their displacement. Indirect impacts caused by EEIP maintenance activities include the potential for a minimal increase in canal water temperatures and the spread of invasive species.

The land cover analysis shows an upper-level estimate of the amount of brush and forest cover types that would be converted into cover types specified in the EEIP, which would be selected to be compatible native plant species that would support and be beneficial to native animal species. This analysis indicates that up to 1,265.8 acres of embankment cover may be converted from brush and cover to a mixture of turf grass, vegetative screening plantings and pollinators, with occasional trees/woody vegetation in Zones 2B and 3 or on projects where thresholds are exceeded, selected to benefit native species. The analysis concludes that this would cause a very small shift (0.041 percent) over time relative to a County-wide perspective and indicates that species responding to converted habitat would have habitat left that it could move to.

3.7.3 Potential Impact of Alternatives

Under the Null or No-Action Alternative, trees and shrubs along embankments would be left to grow. Although this alternative would benefit existing species of plants and animals, the root systems of the non-compatible vegetation could cause piping of the embankment, ultimately leading to embankment failure. Embankment failure could lead to flooding and destruction of habitat used by wildlife adjacent to embankments.

Under the Ad-Hoc Alternative or Project-by-Project Approach, the removal of non-compatible vegetation would be the same as that implemented by EEIP. Therefore, the impacts on plants and animals would be the same as those of the proposed action.

3.7.4 Mitigation

Clearing non-compatible vegetation from earthen embankments is essential for maintaining safety and stability earthen embankments. However, there are specific practices that can be taken to reduce the impact of vegetation removal on wildlife, depending on maintenance location, habitat conditions, proximity of the maintenance activities to the potential habitat, and time of year.

When initial screening of state and federal databases returns RTE species, and, in consultation with NYSDEC, the species or its habitat are confirmed through site visits, efforts would be made to avoid the habitat. ~~If this is not feasible, consultation would be initiated with the NYSDEC.~~ Management practices vary depending on the species in question. Through the consultation process, specific protection measures may be requested by USFWS or NYSDEC depending on the maintenance location, habitat conditions, proximity of the maintenance activities to the potential habitat, and time of year. **Table *3.7-2*** provides some common types of management actions required by USFWS and/or NYSDEC to minimize impacts to frequently encountered species. These actions are dependent on the type of species in or around the project area and include measures such as restricting tree removal to periods when certain species would be least affected, using bright flagging to identify trees for removal, minimizing disturbance, and reducing pesticide/fertilizer applications in known habitat areas.

Table 3.7-6: Avoidance and Minimization Measures

Species	Avoidance and Minimization Measures
Indiana Bat (*Myotis sodalis*)	Restrict tree removal (≥ 4″ dbh) to between October 31 and March 31 Use bright flagging/marking to identify trees for removal
Northern Long-eared Bat (*Myotis septentrionalis*)	Restrict tree removal (≥3″ dbh) to between November 1 and March 31 Use bright flagging/marking to identify trees for removal
Bald Eagle (*Haliaeetus leucocephalus*)	Restrict activities within 660 feet of a Bald Eagle nest during nesting season (January 15 to August 15).
RTE Plant Species considered as compatible vegetation	Avoid and mark (if in Zone 2B or 3 and not a tree) or relocate. Restrict use of pesticides. Consult with other agencies.
Timber Rattlesnake (*Crotalus horridus*)	Provide exclusion fencing to minimize possible construction interactions with snakes

The criteria applied by NYSDEC in determining whether to issue an incidental take permit are set forth in Part 182.12 of the regulations. Generally, in order to obtain an incidental take permit, an applicant must provide the NYSDEC with a mitigation plan that commits the applicant to perform measures that will result in a net conservation benefit to the protected species impacted by the proposed activity. Examples of mitigation plans approved by the NYSDEC include:

- purchase and protection by conservation easement of existing occupied habitat;
- permanent protection of migration corridors;
- creation of new suitable breeding habitat; and
- other land management activities designed to enhance survival and recovery of the protected species.

State and Federally listed plants are not afforded the same level of protection as listed animals. In accordance with ECL Article 9 Title 15 and 6 NYCRR Part 193, protected plants may be destroyed with permission of the landowner, thus agency coordination is not necessary. Regardless, when protected plants are identified during database screening, a concerted effort would be made to avoid and minimize impacts to them. Overall, plants will be managed for compatibility. Opportunities will be provided for compatible species to take root.

In many locations, pollinator planting may be an acceptable substitute for turf grass in Zones 2B and 3 of embankments. Replacing turf grass with pollinator plantings would provide a more diverse habitat for wildlife and would promote the health of pollinators. Some examples of pollinator animals and insects include hummingbirds, bats, butterflies, moths, ants, beetles, bees, and flies. Herbicides and insecticides would not be used in these areas. Non-woody supplemental plantings including certain species of native grass and herbs may also be planted in Zones 2B and 3 of the embankment in certain situations. Adding native grasses and herbs to Zones 2B and 3 would also provide a more diverse habitat to many wildlife species. See Best Management Practices attached to the *Guide Book* in Appendix A under "Pollinator Plantings" and "Vegetative Screening Plantings" for more information.

It is possible that EEIP activities may result in invasive species being introduced or reintroduced on embankments. To address this, NYSCC will pay careful attention to embankments as EEIP vegetation is established and include provisions to address removal of invasive species as part of the contract documents.

A process for avoiding the removal of certain trees or groups of trees in Zones 2B and 3 has been developed. Although the primary purpose of avoiding certain trees is for aesthetic reasons, it would reduce the overall impacts of habitat loss on wildlife. See Section 3.9 for more information about this process.

3.8 Agricultural Resources

The Federal Farmland Protection Policy Act, which applies to federal agencies, and the New York State Agriculture and Markets Law protect farmland from being lost due to conversion to other uses, such as development or infrastructure. The scope of this environmental review does not include the permanent acquisition of additional property to perform EEIP activities; therefore, these protections do not apply. Temporary access along the outside toe of embankments or feeders and outside NYSCC right-of-way may be required to construct improvements; however, this temporary taking would not permanently impair agricultural activities.

3.8.1 Environmental Setting

According to the New York Farm Bureau, "New York is a leading agricultural state, worth $5.75 billion in revenue 2017." According to the USDA 2017 Agricultural Census, there were 33,438 farms in New York State and 6,866,171 acres in production. Much of the canal system is adjacent to agricultural land. In a report issued by the Office of the New York State Comptroller, the state's largest agricultural commodities include milk, grains, cattle, and fruits. In the counties where the canal system is located, the highest percentages of total land area in farmland is in the western New York counties, as shown on **Figure *3.8-1***.[62]

[62] Office of the New York State Comptroller, "A Profile of Agriculture in New York State," August 2019, https://www.osc.state.ny.us/files/reports/special-topics/pdf/agriculture-report-2019.pdf .

One of the most important agricultural resources is soils. Farmers also need access to open lands suitable for farming. Farmers need to be able to install and use various land management systems to support the farm operation including irrigation, manure spreading, and the ability to move equipment.

The NYSCC allows the use of waters from the canal during the navigation season in some locations for irrigation of farmlands. For example, in the Sixty-Mile Pool of the Western Erie Canal (which runs between Rochester and Lockport), there are several NYSCC-permitted siphons, ranging from 2 inches through 8 inches in diameter, that have been installed by adjacent farming interests to draw water from the canal to support their existing irrigation needs.

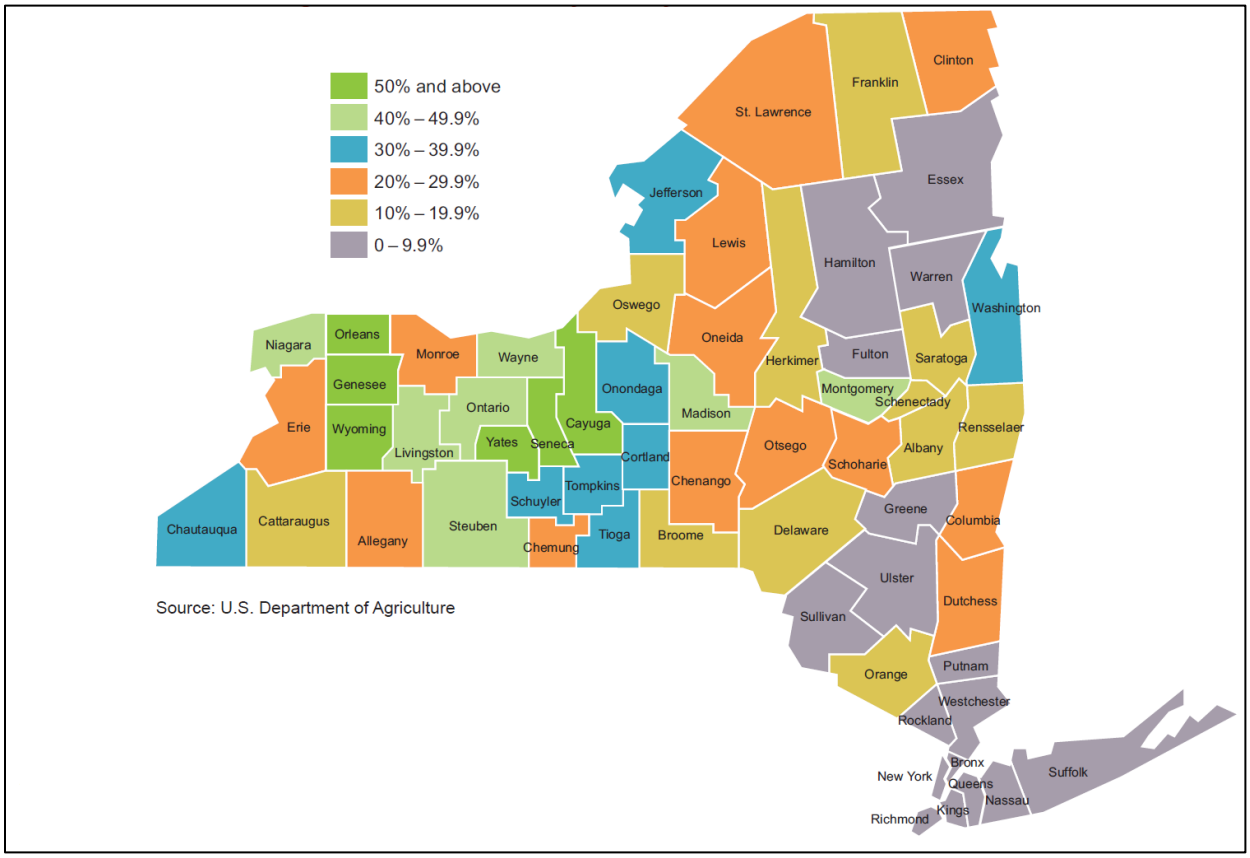

Figure 3.8-1: Farmland as a Percentage of Total Land Area by County, 2017

3.8.2 Potential Impacts of Proposed Action

As mentioned above, EEIP activities are accomplished within land under the jurisdiction of the NYSCC. Therefore, there would be no direct impact from farmland conversion. In the *Guide Book*, it is noted that access to perform EEIP activities may be obtained through a Site Access/Vegetation Management Permit (see Section 8 of the *Guide Book*). Installation of fences or even landscaping in the wrong location could prevent farmers from reaching their fields. In these situations, there could be a temporary easement such that could result in the temporary loss of the use of a small parcel of land or loss or of access for the farmer. In addition to potential impairment of access to farmland, EEIP activities could impair the use of the canal for irrigation in those areas where EEIP activities are conducted; however, this would be the case only during navigation season. Most EEIP activities are anticipated to be performed during the non-navigation season where there would be no impairments to irrigation.

The magnitude of impacts would be low for most EEIP activities. Furthermore, EEIP activities, would occur during the non-navigation season, which coincides with the non-growing season for the region. If there is a situation where EEIP activities limit access to farmland it would occur

at a time of year when access by farmers is generally not needed. Finally, situations where EEIP activities limit access by farmers to their farmland would be temporary. For example, the EEIP activity of clearing trees and brush would require a limited time during the non-growing season. Access by NYSCC to perform this work, which could block access for a farmer, would be for a limited duration. Therefore, the impact of blocking the farmer's meaningful and necessary access to his or her land would be negligible.

A beneficial impact of EEIP activities to adjacent farmland is that the removal of trees and brush can open up sunlight for improved crop-growing conditions immediately adjacent to embankments and feeders. This could add a row or two of crops that were not previously viable for the farmer — an opportunity that is generally considered a significant benefit to a farmer.

In some cases, runoff and drift from application of pesticides and fertilizer to earthen embankments could flow or blow onto farmlands. This chemical migration could be a significant impact to organic farms where they are located adjacent to the embankments. Such activities could ruin organic crops from being sold as such.

An unlikely scenario could occur where the chemical migration could combine with that of the adjacent farmland which also utilizes pesticides and fertilizer to cause cumulative effects to land and water. Such impacts are unlikely to occur and are not reasonable to pursue further. See Section 3.4 for additional discussion of potential impacts from pesticide and fertilizer use.

Some adjacent farmland utilizes groundwater wells for irrigation. See Section 3.5 Groundwater for additional discussion on potential impacts to groundwater resources.

3.8.3 Potential Impact of Alternatives

Under the Null or No-Action Alternative, earthen embankments would be ~~left to fail~~ at greatest risk of failure compared to other alternatives. Prior to any such failure, there would be little or no measurable impact to agriculture. At such time that the embankments would fail, water contained within the canal prism would be rapidly released. Section 3.6.3 describes the potential impacts associated with such an event. Besides the potential damage to homes and businesses, a breach would damage agricultural lands where present.

Under the Ad-Hoc Alternative or Project-by-Project Approach, the ultimate impact to agriculture would be similar to that of the proposed action. The difference would be in timing of the impacts. Under the EEIP program, the maintenance would be planned and executed proactively, while under the Ad-Hoc Alternative, the maintenance would be commenced when conditions become unsafe, increasing the potential for a breach over that of the proposed action. In addition, the ad-hoc approach has the potential for greater impacts than the EEIP actions, because emergency repairs may be necessitated as the canal and feeder embankments deteriorate. Emergency repairs may require canal shutdown during the navigation season, which closely matches the growing season for adjacent farmland and may have a greater effect on

adjacent agricultural activities than an efficiently planned out embankment maintenance operation.

3.8.4 Mitigation

Planning and coordination with adjacent farmers (as documented in Section 8 of the *Guide Book*) regarding the best means and timing of access to embankments would help to avoid or minimize the potential for temporary impacts to agricultural resources resulting from impaired access.

In planning for EEIP activities involving pesticides and fertilizers, adjacent properties would be notified. The NYSCC would identify and track any adjacent properties where organic farming is performed and consider alternatives in such areas. Potential impacts from the use of pesticides and fertilizer would be avoided or minimized by applying the mitigation measures described in Section 3.4.4.

There is also a Best Management Practice attached to the *Guide Book* for planting pollinators on earthen embankments. According to the U.S. Department of Agriculture's Natural Resources Conservation Service, "three-fourths of the world's flowering plants and about 35 percent of the world's food crops depend on animal pollinators to reproduce. More than 3,500 species of native bees help increase crop yields." The use of pollinator plants on earthen embankments adjacent to farmland would be a benefit to pollinators, which would benefit the adjacent farmland. Pollinators visit flowers in their search for food (nectar and pollen). During a flower visit, a pollinator may accidentally brush against the flower's reproductive parts, unknowingly depositing pollen from a different flower. The plant then uses the pollen to produce a fruit or seed. Many plants cannot reproduce without pollen carried to them by foraging pollinators.[63]

3.9 Aesthetic Resources

In the broadest sense, visual resources are the visible features that make up the landscape – the landforms, the vegetation, the water bodies, and the cultural patterns that we are familiar with. Visual resources define our sense of place, where we work, live, and recreate.

An ever-expanding body of research has demonstrated that aesthetic values (the perceived beauty of a place or structure) are shared among the general population. Landscape preference and perception are not arbitrary or random. Many places have been recognized for their beauty and designated by the federal or state government, reinforcing the notion that aesthetic values are shared and these special places have been formally recognized as such. Through these designations, the federal or state government has determined that such places have aesthetic value and that their values are worthy of protection. For example, millions of people visit

[63] "Insects and Pollinators," USDA Natural Resource Conservation Service, accessed December 3, 2020, https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/plantsanimals/pollinate/.

Niagara Falls and many other attractions and have a shared appreciation of the beauty of such places. There is substantial regularity in human perceptions of significant adverse and beneficial visual impacts. To this point, the New York State Department of Environmental Conservation developed a policy for assessing and mitigating visual and aesthetic impacts, which was used as a resource for guiding ~~guided~~ the analysis in this FGEIS ~~DGEIS~~.[64]

3.9.1 Environmental Setting

Regional Landscape and Land Use

The geography of New York is diverse. New York State (excluding Long Island) is divided into seven physiographic provinces; these range from high relief in the Adirondack and Catskill Mountains to low relief along the Great Lakes and the St. Lawrence, Hudson, and Mohawk River Valleys. The majority of the project area lies within the Central Lowlands physiographic province, a subdivision of the Interior Plains. This area occurs south of Lake Ontario and the Adirondack uplands, and is from 10 to 30 miles wide. The easternmost section of the project area (roughly from Utica to Albany and up to Whitehall) lies within the Ridge and Valley Province, a subdivision of the Appalachian Plateau, which includes the Mohawk Valley (see ***Figure 3.9-1***).

The Central Lowlands are the plains which border the Great Lakes. They abut the Appalachian Plateau to the south, and Tug Hill on the east. The Ontario lowlands are an area of generally subdued topography, except for the Niagara escarpment and the swarms of drumlins south of Lake Ontario. The generally low relief is provided by a series of preglacial lake beach ridges. The Ontario Lake Plain is a sandy lake plain with east-west ridges which represent old shorelines of a former glacial lake. The Ridge and Valley Province lowland is bounded everywhere by uplands. In general, the low relief is caused by the glacial deposits. A central lowland portion consists of a valley on both sides of the Hudson River extending to near Whitehall.[65]

It is not surprising that the Erie Canal system follows the north-south and east-west valleys and lowlands between the mountain ranges to the north and south in New York State, as this afforded the most conducive opportunity to build a navigable waterway connecting the eastern and western parts of the state.

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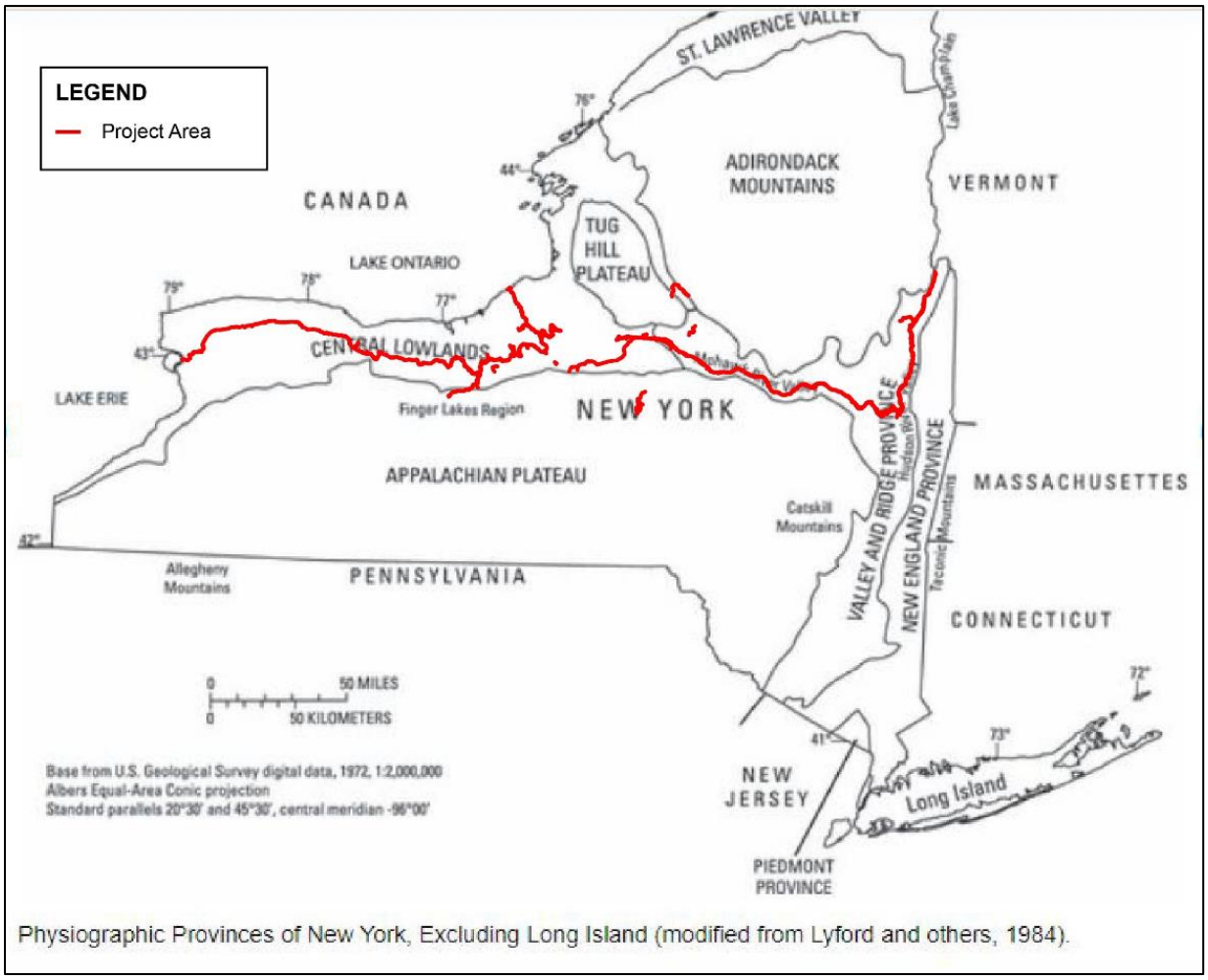
64 "Assessing and Mitigating Visual and Aesthetic Impacts," DEC Program Policy, December 13, 2019, Article 8, 49, Department Id: DEP-00-2, Division of Environmental Permits, and New York State Department of Environmental Conservation, https://www.dec.ny.gov/docs/permits_ej_operations_pdf/visualpolicydep002.pdf.

65 "Geomorphic Provinces and Sections of the New York Bight Watershed," National Oceanographic Data Center, accessed December 3, 2020, https://www.nodc.noaa.gov/archive/arc0034/0071981/1.1/data/1-data/disc_contents/document/wp/geolsect.pdf.



Physiographic Provinces of New York, Excluding Long Island (modified from Lyford and others, 1984).

Figure 3.9-1: Physiographic Provinces of New York and Project Area

Due to its location within the valleys and lowlands of the Great Lakes, the general landscape of the canal corridor is relatively level and flat within the central lowlands, and well-defined by adjacent topography from Utica east to Albany, including the feeder canals north to Whitehall, New York, in the Hudson Valley. The landscape within the central lowlands, given its relatively level and flat topography, is highly agricultural in central and western New York State. The canal travels through various small, urbanized settlements (villages and hamlets located on the canal), expansive cultivated agricultural areas, and interspersed between, forested and fallow lands. Oftentimes the man-made embankments resulting from the digging of the canal are the major topographical feature within the corridor. Consistent with the linear nature of the lowlands, the canal corridor is highly linear in nature, with long sweeping curves as the canal meanders through the state.

Within the ridge and valley province, generally from Utica eastward, the canal waterway largely parallels or is coincident with natural waterways such as the Mohawk River and portions of the

Hudson River. Here the landscape is much more variable with long stretches of natural riverine corridor bordered by highways, adjacent hills and steep-sloped topography, occasional small, urbanized areas (hamlets and villages), large, urbanized cities (Utica, Schenectady, the Albany area), and the rugged, wooded and largely undeveloped area northwards towards Whitehall and the Adirondack Park.

The New York State Canal System is a perfect example of an ethnographic landscape that has been modified by human intervention. It possesses positive scenic values associated with some human modified (cultural) features and settings that are valued for their scenic influence. It is important to note, however, that upon completion of the canal, embankments were free of trees and their main visual characteristic was the consistent landform created parallel to the new waterway.

Figure 3.9-2: Historic View of Canal at Eagle Harbor Waterport Road, Orleans County, NY

In December 2000, the Erie Canalway National Heritage Corridor Act (PL 106-544, title VIII) was adopted by Congress. This designation applies to all 234 municipalities adjoining the 524 miles of navigable waterway that compose the New York State Canal System, including the Erie, Champlain, Cayuga-Seneca and Oswego Canals; the historic alignments of these canals, including the cities of Albany and Buffalo; and related navigable lakes, including Seneca and

Cayuga Lakes. The legislation acknowledges the instrumental role the canals played in the growth and development of the United States and affirms a national interest in the preservation and interpretation of the Corridor's important historic, cultural, recreational, educational, scenic and natural resources.[66]

The Erie Canalway National Heritage Corridor joins a distinguished group of over two dozen other nationally significant heritage regions located throughout the United States, each of which has made a unique contribution to the nation's development and growth. These areas, ranging in size from an entire state to urban districts, have used their status to promote themselves as special tourist destinations that combine a strong sense of place and natural scenic beauty with expanded opportunities for recreation and exploration of national history. In the most successful national heritage areas, intensive planning efforts have also elevated the quality of life for residents by protecting and interpreting their region's distinctive historic and natural features and building partnerships for community-based recreational and economic development.[67]

The Erie Canal corridor has received several such designations (Erie Canalway National Heritage Corridor Act (PL 106-544, ~~t~~Title VIII), seven New York State Designated Heritage Areas involving the canal system, the New York State Barge Canal National Register Historic District), recognizing the cultural value of the corridor and its special features, including its visual resources, and its need for protection.

The locations of the National and State Heritage areas overlain on the Project Area are shown in **Figure *3.9-3***.

[66] Erie Canal Preservation and Management Plan, 2006.
[67] Erie Canal Preservation and Management Plan, 2006.

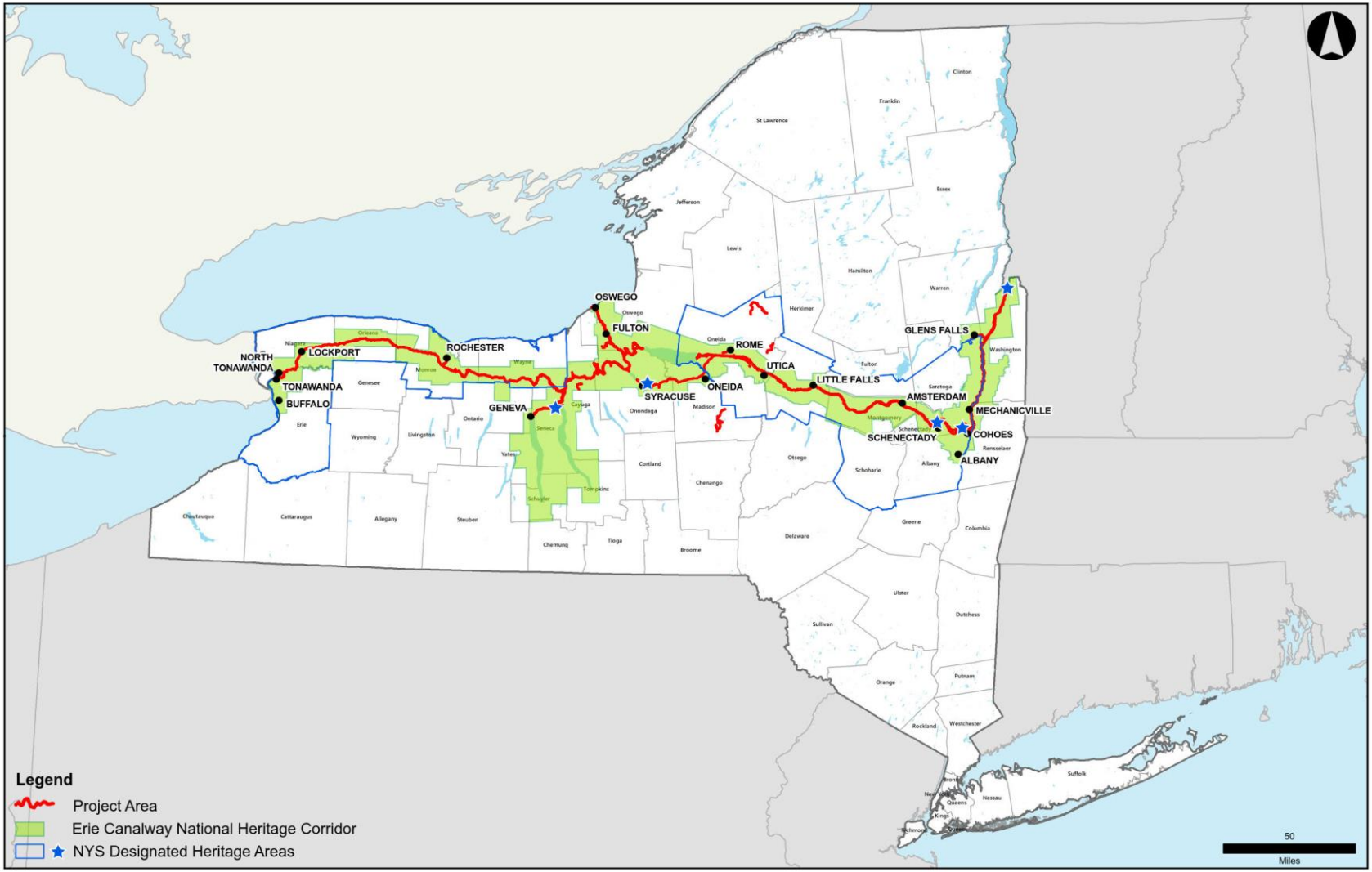


Figure 3.9-3: Heritage Areas in the Project Area

Viewer Groups

The receptivity of different viewer groups to the visual environment and its elements is not equal. Activities such as commuting in heavy traffic or working on a construction site can distract an observer from many aspects of the visual environment. Head-mounted cameras, for instance, have demonstrated that a driver can look directly at a landmark and still not see it. On the other hand, activities such as driving for pleasure or relaxing in scenic surroundings can encourage an observer to look at the view more closely and at greater length. The NYSDEC's Visual Policy also calls for the identification of the designated aesthetic resource users and the activity in which such viewers are engaged in order to understand their probable sensitivity to a particular visual intrusion. Therefore, viewer activity is an identifying characteristic of viewer groups.[68]

Visual sensitivity will vary with the type of users. Recreational sightseers may be highly sensitive to any changes in visual quality, whereas workers who pass through the area on a regular basis may not be as sensitive to change. Put another way, the susceptibility of different receptors to change in views and visual amenity is mainly a function of:

- the occupation or activity of the people experiencing the view at particular locations (viewer activity); and
- the extent to which their attention or interest may therefore be focused on the views and the visual amenity they experience at the particular locations (viewer sensitivity).

The visual receptors utilizing the canal corridor most susceptible to change are generally likely to include the following:

- People, whether residents or visitors, who are engaged in outdoor recreation, including use of public rights-of-way, whose attention or interest is likely to be focused on the landscape and on particular views
- Visitors to heritage assets, or to other attractions, where views of the surroundings are an important contribution to the experience
- Communities where views contribute to the landscape setting enjoyed by residents in the area
- Residents at home

Travelers on road, trail or other transport routes (waterways) tend to fall into an intermediate category of moderate susceptibility to change. Where travel involves recognized scenic routes (such as the Canalway Trail and the canal itself) awareness of views is likely to be particularly high.

[68] "Visual Impact Assessment for Highway Projects," American Society of Landscape Architects, Federal Highway Administration Contract DOT-FH-9694, 1981, 9-10.

Visual receptors likely to be less sensitive to change include:

- People engaged in outdoor sport or recreation which does not involve or depend upon appreciation of views of the landscape
- People at their place of work whose attention may be focused on their work or activity, not on their surroundings, and where the setting is not important to the quality of working life

To predict viewer responses to changes in the visual environment, it is important to identify the viewer groups who will be seeing the project. When assessing the viewer groups, four factors become important: viewer exposure, viewer sensitivity, viewer activity, and viewer awareness. Viewer exposure is quantitative and defines the physical parameters of how viewers see and perceive their visual environment. Aspects of viewer exposure include number of viewers, distance, duration of view, viewer position, and traveling speed. Viewer sensitivity is the receptivity of the view by the viewer groups. It is related to the values placed on the appearance of visual resources by the viewers and can be considered a qualitative measure of the response to the view.

Each one of these factors influences how a viewer group will respond to changes. Within the NYSCC corridor, viewers can be categorized into three groups: **recreationists** (Erie Canal or Canalway Trail users such as boaters, pedestrians and bicyclists); **tourists** (visitors to the adjacent villages, canal-side businesses, historic sites, and parks) and **residents (**those who live along or adjacent to the canal corridor).

Recreationists (Erie Canal and Trail Users) — The 360-mile Erie Canalway Trail and 90-mile Champlain Trail composing the Erie Canalway Trail system is one of New York State's premier outdoor destinations. The trail gives millions of New Yorkers in more than 200 canal-side communities a dedicated place to walk, jog, and bike right from their doorsteps. Parks & Trails New York (PTNY) estimates that the Canalway Trail system as a whole saw over 3.3 million visits in 2019, including three million visits to the Erie Canalway Trail and just under 300,000 visits along the in-progress Champlain Canalway Trail.[69]

[69] The estimated use figures are based on a methodology used by the Hudson River Valley Greenway and Alta Planning and Design used to estimate the annual number of users (8.6 million) that will use the Empire State Trail when complete at the end of 2020. These numbers are significantly higher than past PTNY estimations and are likely due to major investments in closing the gaps in the Canalway Trail system in recent years. The total use projections are an estimate only, and further trail data in future years will help refine the estimate.

The 524 miles of navigable canal waterways had an increase of 3.4% motorized pleasure boats (the most-common vessels on the canals) in 2018. That year boats were recorded traveling through canal system locks and lift bridges 71,463 times during navigation season.[70]

The recreational use of the Erie Canal and the Canalway Trail includes boaters, bicyclists and pedestrians, with peak usage for both the trail and waterway occurring between June and September.[71] Some of the draw of the canal is its variety of scenic qualities, comprised of villages and urbanized areas, tree-lined trail and waterway, farmlands, and forested undeveloped areas. Some users of the canal waterway or trail system would be exposed to long stretches of the canal, traveling at slower, more leisurely speeds, resulting in high viewer exposure. Unlike motorists on a multi-lane, high-speed highway focused primarily on the road, trail and waterway uses have chosen this route specifically for recreational purposes and are traveling at a slower pace with more focus on their surroundings, thereby increasing viewer sensitivity and awareness.

Tourists (visitors to adjacent villages, canal-side businesses, historic sites, and parks) — Visitors to the adjacent villages, canal-side businesses (inns, restaurants, etc.), historic sites or museums, and parks make up this group. This viewer group awareness may be moderate since their primary destination or activity is not the canal itself, but a site located on or adjacent to the canal. Viewer exposure and sensitivity is also moderate due to their limited, static, and temporary views of the canal corridor.

Residents (homeowners, renters, and employees of businesses adjacent to the canal corridor) — Homeowners and renters in and around the project area have a more static and very limited view of the project area, immediately adjacent to or surrounding their property. Therefore, viewer exposure is low, although viewer sensitivity can be high due to their prolonged, detail-focused view. Employees of local businesses are engaged in day-to-day business dealings and therefore have a reduced awareness, as well as a shorter exposure time to the project area making their viewer exposure and sensitivity low.

It should be noted that according to the NYSDEC's Visual Policy, an individual citizen's expression of concern regarding visual impacts is sometimes based on the belief that a property or particular "neighborhood" lies within the viewshed of a proposed action. While the citizen's concern may be valid in terms of their individual property, it may not come within the concerns of the Visual Policy. The Visual Policy is intended to address places or locations that have been officially designated for their aesthetic qualities and that are accessible to the public at large as opposed to places that may have individual or private importance only.[72] In respect of private

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[70] The figures account for each time a boat goes through a lock or under a lift bridge, not the actual number of boats. If a boat travels through several locks, it would be counted as locking through each time. The numbers also do not account for boaters who only travel locally and do not go through a lock. A large percentage of boating traffic falls into this category.

[71] "Who's on the Trail," The 2019 Canalway Trail User Count, Parks & Trails, NY

[72] "Assessing and Mitigating Visual and Aesthetic Impacts," DEC Program Policy.

views and visual amenity, it is widely known that no one has "a right to a view." This includes situations where a residential property's outlook is judged to be "significantly" affected by a proposed development, a matter which has been confirmed in a number of appeal/public inquiry decisions.[73]

3.9.2 Potential Impacts of Proposed Action

The EEIP activity of vegetation removal on affected embankments has the potential to change the visual quality of the canal corridor, which could lead to change or degradation of aesthetic and natural character, and degradation of outdoor recreational experiences. The EEIP has been developed to diminish the risk of failure of the canal and feeder embankments while preserving the aesthetic and natural character where appropriate and possible to do so in a manner that minimizes residual risk to adjacent communities.

For the purposes of this study, aesthetic resources within the EEIP canal project area to be considered are those officially designated by local plans and/or zoning. Information from the Erie Canalway National Heritage Corridor organization and/or one of the New York State Heritage Areas will also be considered in identifying aesthetic resources.

The NYSDEC Visual Policy identifies aesthetic resources of statewide significance from several categories. For the purposes of this analysis, aesthetic resources of statewide significance affected by the proposed action are derived from the following categories:

- A historic resource listed or eligible for inclusion in the state or national registers of historic places; (with the exception of where the resource is derived solely from the Barge Canal itself, such as The New York State Barge Canal National Historic Landmark (see Section 3.10). The visual impact must deal specifically with aesthetics relating to the immediate canal and canal feeder landscapes with embankments, and not to the entire area within the designated district boundaries. Only those resources that have an aesthetic value associated with them should be considered as part of an assessment of the potential significance of the impact.
- State parks (Parks, Recreation and Historic Preservation Law Section 3.10)
- National Wildlife Refuges (16 U.S.C. 668dd), and State Game Refuges (ECL 11-2105). Montezuma Swamp is the only National Wildlife Refuge adjacent to the Erie and Cayuga-Seneca Canals.
- National Natural Landmarks (36 CFR Part 62); see Section 3.3.

[73] "Residential Visual Amenity Assessment (RVAA)," Technical Guidance Note 2/19, Landscape Institute, accessed December 3, 2020, https://landscapewpstorage01.blob.core.windows.net/www-landscapeinstitute-org/2019/03/tgn-02-2019-rvaa.pdf.

Not all the categories noted above and contained in the NYSDEC's Visual Policy's Inventory of Aesthetic Resources were designated because of an associated aesthetic value or quality. Therefore, only those resources that have an aesthetic value associated with them should be considered as part of an assessment of the potential significance of the impact. The aim of a visual impact analysis is to determine potential visual impacts. It is not intended to be an exhaustive analysis of every resource that falls within one of the 16 categories described in the NYSDEC's Visual Policy's Inventory of Aesthetic Resources. The test of significance should focus on the impairment of the aesthetic value or quality associated with the resource, not mere presence within a viewshed. Consequently, all aesthetic resources identified within the viewshed of a project must have an explanation of their specific value and quality addressed in the assessment and may require consultation with the relevant state or federal agency responsible for the designation of such a resource to identify the specific quality or value.[74]

Visual impacts can be identified based on the degree of compatibility a proposed project or action has with the existing environment, whether or not it enhances or negatively interrupts the visual character of the landscape, disrupts the harmony of the basic elements (i.e., form, line, color, and texture), and the length of time a particular visual impact will be in existence.

The categories noted above, being those that may include areas of aesthetic value or quality, are reflected in the thresholds listed on **Table *1.3-1*** in Section 1.3.4. Aesthetic resources that will require close scrutiny under the EEIP are included in **Table *1.3-1*** and include:

- NYSCC property where EEIP activities are contemplated is also a public park, and those maintenance activities would significantly impair the park's aesthetic, historic or recreational function.

- Where historic resources listed or eligible for inclusion in the State or National Registers of historic places, are located on or in close proximity to NYSCC property where EEIP activities are contemplated, and the EEIP activities would result in a determination of an adverse effect on the historic resource by the Agency Preservation Officer or the SHPO.

- Where an aesthetic resource of local importance has previously been identified through an adopted comprehensive plan or zoning and is located on lands where EEIP activities are contemplated and those activities would significantly damage the aesthetic character of the resource.

- Where EEIP activities would have a significant adverse effect on an aesthetic resource of Statewide Significance derived from one or more of the categories identified in

[74] "Assessing and Mitigating Visual and Aesthetic Impacts," DEC Program Policy.

Section VI.A., of NYSDEC Program Policy DEP-00-2 "Assessing and Mitigating Visual and Aesthetic Impacts."[75]

- Where EEIP activities are inconsistent with an approved Local Waterfront Revitalization Plan (LWRP) in accordance with the New York State Waterfront Revitalization of Coastal Areas and Inland Waterways Act (NYS Executive Law, Article 42).

For locations on a specific section of embankment where EEIP activities are planned, and where any of the resources described above and described in Table 1.3-1 as community thresholds are present, a screening review would be performed by an arborist and landscape architect or other qualified professional in visual analysis. This would be done as part of the site-specific environmental screening presented in Section 8.15 of the *Guide Book*.

The process for implementing the proposed project includes the following steps:

1. Identify and locate canal and feeder embankment segments based on desktop reviews followed by field reviews. Verify the NYSCC rights-of-way and easements within canal and feeder embankment segments.

2. Utilize the embankment rating system ~~risk assessment screening process~~ summarized in Section 1.3.3, and described in further detail in Section 3 of the *Guide Book* to identify the relative risk associated with each embankment segment to prioritize the order in which embankment inspections will be completed and what specific EEIP activities will be programmed.

3. As canal and feeder embankment segments are identified and scheduled for EEIP activities, record plans, existing mapping, technical reports, and previous inspection reports will be reviewed. ~~A field review~~ Embankment inspections will be performed of canal and feeder embankment segments as described in Section 4 of the *Guide Book*.

4. Perform a segment-specific Environmental Review as described in Section 8 of the *Guide Book,* including identification of any permits needed for the work. The Environmental Review will be done by a multi-discipline team and include an assessment of impacts and understanding of the conformance of those impacts to the thresholds set by this GEIS. Where the community thresholds described above are exceeded ~~apply~~, follow the steps outlined in Section 8.15 of the *Guide Book*. These include a field visit and assessment by a visual impact professional will be included.

[75] "Assessing and Mitigating Visual and Aesthetic Impacts," DEC Program Policy.

Direct Impacts

The EEIP has been developed to include avoiding significant aesthetic resources. Vegetation removal on the embankments would reduce the amount of tree cover which may be adjacent to a trail and change its aesthetic character and experience offered to the trail and waterway user. In some areas, it would result in a greater amount of cleared, exposed trail, with a lack of variety afforded by the adjacent vegetation. The embankment vegetation also provides a measure of screening of adjacent land uses from the trail, as well as screening of the trail users from adjacent properties and parallel roadways. Embankment vegetation also provides a measure of screening for adjacent properties from roadways and businesses on the opposite side of the canal. The potential homogenization of the trail environment may degrade the scenic variety and quality of the canal corridor, and result in the diminishment of public enjoyment and appreciation of the aesthetic resources of the corridor.

Figure 3.9-4: Visual Impact of Single Tree Retention

This diminishment would be lessened where there is either no embankment on the opposite shore, or the removal of that embankment vegetation is of low priority, so that existing vegetation would remain.

On the other hand, many areas of cleared embankment will open up new scenic views from the adjacent trail or from the waterway that were not visible before due to the intervening embankment vegetation. Tree clearing in some areas surrounded by dense wooded areas may also add some variety to the visual experience for area users.

There are other embankment areas where there are no thresholds and no trails along the embankment. In this situation, the removal of trees would have a minimal adverse impact on aesthetic resources.

Indirect Impacts

Vegetation removal may result in a reduction of enjoyment by users in select areas of the canal trail and waterway due from the direct impacts described above. This could result in fewer users in such areas; however, in the larger scope of the project, such impacts would not be considered significant.

Cumulative Impacts

The potential for adverse direct and indirect impacts is discussed above. There are no other future activities planned for the earthen embankment areas by the NYSCC, and there are no activities on the embankments that would be allowed by others without permission and control by the NYSCC. There is no meaningful information regarding previous impacts to the embankment areas, as this would be from the original construction of the embankments, and in many locations, from the construction of previous versions of the canals. It is therefore concluded that the potential for cumulative impacts would be restricted to the potential for direct impacts.

Conclusion

The potential impact from EEIP activities would be limited to the direct and indirect impacts for the situations described above. The EEIP includes procedures to identify and avoid impacts to significant aesthetic resources. All embankment repairs and vegetation management work under the EEIP would be done in full compliance with New York State regulations. The impacts would also be spread out over time and location.

3.9.3 Potential Impact of Alternatives

Under the Null or No-Action Alternative, any earthen embankments along the man-made sections or canalized river sections of the canal system would be ~~left to fail~~ at greatest risk of failure compared to other alternatives. Prior to any such failure, there would be no aesthetic impact other than the continued growth of vegetation that may obstruct views. At such time that the embankments along the canal system would fail, aesthetic impacts would result from the failed earthen embankment that would likely be disfigured from washout/erosion as well as the loss of vegetation on the failed segment. Repairs of the embankment would also result in a loss of aesthetic resources as the damaged embankment sections would not have had the benefit of a carefully designed approach, with an assessment of vegetation that may have been able to remain. This reactive approach to repair eliminates the ability to selectively clear or save suitable vegetation on the embankments, resulting in completely cleared embankment sections where failure has occurred. Additionally, due to the potential emergency and time-sensitive response needed, the engineered solution would likely result in the removal of additional vegetation in order to sufficiently repair the earthen embankment quickly and prevent further failure. Even if the repair would exceed regulatory and community thresholds due to the

emergency nature of the required repair, the design solution would not be able to proactively incorporate a design review with the involved community.

Under the Ad-Hoc Alternative or Project-by-Project Approach, the ultimate impact along the man-made sections or canalized river sections of the canal system with embankments would likely be more significant than that of the proposed action. Because maintenance would be commenced when conditions become unsafe, increasing the potential for a breach, there would be less opportunity for a comprehensive approach and weighing of options regarding saving suitable vegetation due to the impending emergency situation and required speed of repair.

Under the Ad-Hoc and Null or No-Action Alternative, the maintenance would be in reaction to an impending or current emergency that would preclude the opportunity to assess vegetation that could potentially remain.

3.9.4 Mitigation

In progressing EEIP activities, it would not be possible to avoid all potential impacts to visual resources while assuring the stability and safety of the earthen embankments.

To minimize impacts to aesthetic resources for embankment segments where any of the ~~regulatory and~~ community thresholds noted above are exceeded, the procedures described in Section 1.3.4 and Section 8.15 of the *Guide Book* would be taken. These procedures include:

~~For all EEIP activities that are shown to have a potential to affect aesthetic resources the application of Scenic Management Guidelines would be considered. Scenic Management Guidelines (see the *Guide Book*) would be applied as appropriate where embankment sections meet specific criteria based on their location, usage, and adjacent land use and activities.~~

1. Remove trees and brush smaller than 3 inches in diameter at breast height (DBH) that impede inspections and trees larger than or equal to 3 inches DBH that are dead, diseased, and imminently dangerous to property and people. Provide, as necessary, emergency response to stabilize embankments.

2. Perform an embankment condition survey and a tree inventory with an arborist, landscape architect, and engineer to assess the potential of preserving any trees. The arborist would determine the tree's health and viability; the landscape architect would determine the aesthetic suitability of the preserved tree within the context of the overall project limits; and the engineer would determine the feasibility of its retention with respect to its effect on embankment integrity and trail user safety. Confirm the reasonableness of the following: 1) a baseline conceptual design retaining healthy, non-invasive trees in Zones 2B and 3; 2) a conceptual design with limited tree removal to facilitate necessary corrective actions to address identified seeps (healthy trees equal to 3" DBH and greater remain outside Zone 2B and 3); or 3) perform enhanced inspections

and engineering evaluations over a 5 year period in lieu of executing the conceptual designs.

3. Engage with community task force based on specific thresholds identified. Community task force members will review and discuss the conceptual designs provided by the NYSCC that mitigate aesthetic effects and indicate which of the NYSCC conceptual designs is preferred considering the overall project schedule. All final conceptual designs must consider the results of the embankment condition survey and be approved by the Engineer of Record.

4. If a different conceptual design can be agreed upon and approved by the Engineer of Record, these measures would be implemented and the EEIP activities would continue as prescribed in Figure 1.3-3. If none of the conceptual designs involving additional tree removal are determined to be appropriate by the Engineer of Record, continue with Action Item 5 below. No additional tree removal beyond that described in Action Item 1 above occurs in any zones, however, NYSCC will stabilize and establish appropriate ground cover.

5. Perform more detailed inspections, including detection of embankment seepage and embankment stability monitoring. The prescribed content and frequency of inspections is provided in the *Guide Book*. These include bi-weekly to monthly Bank Walk Inspections and quarterly Enhanced Embankment Monitoring for a more detailed investigation.

6. If the results of the detection and monitoring of embankment seepage and embankment stability suggest that the embankment is stable, a seepage and monitoring program would be developed and implemented. Perform additional surface stabilization as needed to prevent surface erosion. Monitoring may include: piezometers, slope indicators, observation wells and seepage weir boxes. Seepage and stability monitoring would continue for an additional 5 years if the gathered information suggests that the embankment is stable. At the conclusion of the 5-year period, the earthen embankment would be reassessed and the *Guide Book* procedure would commence again as shown on Figure 1.3-3. During the 5-year monitoring period dead and dying trees would be removed.

7. If the results of the seepage and stability monitoring indicate instability or that safe conditions are deteriorating, corrective, large scale engineering solutions possibly extending over entire embankment segments could be implemented (e.g., sheet piling, clay cutoff walls, lining the canal, etc. as noted in Figure 1.3-3). Such solutions are not addressed in the *Guide Book*. Implementation of corrective engineering solutions would be considered a separate site-specific action under SEQR and would be reviewed accordingly.

The mitigation procedure is shown in Figure 1.3-3, illustrating the evaluation and corrective action process for Canal embankments, where regulatory or community thresholds, shown in Table 1.3-1, are exceeded. If at any time, safety and conditions elevate to an emergency condition, such conditions shall be remediated pursuant to NYSCC emergency response procedures.

Scenic Management Guidelines for Projects Where Community Thresholds are Exceeded

The following scenic management guidelines should be considered as part of developing conceptual designs for embankment segments where community thresholds are exceeded.

1. No trees located within Zone 1 will be allowed to remain because of the need to maintain navigation safety.
2. Where a recreational trail is present, no tree in Zone 2A and 2B should be allowed to remain within the allowable clear zone distance specified outside the edge of travel way in accordance with AASHTOs Guide for the Development of Bicycle Facilities (AASHTO, 2012).
3. In areas where there is a very wide Zone 2B relative to embankment height, tree vegetation (equal to or > 3" DBH) and that is not an invasive species, is healthy, is not a danger tree, and is outside the allowable AASHTO clear zone should be preserved to the greatest extent possible.
4. Pollinators and Vegetative Screening Plantings found in *Guide Book* Attachment 1, are optional features that may be added to the development of conceptual designs within Zones 2B and 3 when requested by the Community Task Force.
5. In locations where seepage controls are required by the Engineer of Record, NYSCC will make all possible efforts to provide seepage controls (typically located in Zones 4 and 5) that do not include exposed gravel surfaces but buried gravel covered with new turf, however, where exposed stone linings are required for toe drains and filter blankets, within the viewshed of the trail or waterway a blend of standard dolomite stone meeting NYSDOT material and size specifications, and Medina stone or some other suitable stone would be installed to minimize the visual impact. This would match treatment in other historic sections of the canal.

~~Under the EEIP, maintenance would occur in a planned manner that allows for an assessment to save a minimal amount of vegetation including trees, determined to be compatible, within certain portions of Zones 2B and 3 of the embankments. Refer to Figure 3.2-2. The Scenic Management Guidelines would include:~~

- ~~An on-site visual assessment of the embankment cover to identify the trees in Zones 2B and 3. If it is just herbaceous and shrub cover, no further action is required with regards to preserving existing vegetation, as this vegetation would be removed.~~

- ~~If there is a mix of semi-to-mature tree cover in Zones 2B and 3, and where they are in areas of aesthetic resources from Table 1.3-1in Section 1.3.4, a site visit would be performed with an arborist, landscape architect, and engineer to assess the potential of preserving any trees. The arborist would determine the tree's health and viability; the landscape architect would determine the aesthetic suitability of the preserved tree within the context of the overall project limits; and the engineer would determine the feasibility of its retention with respect to its effect on embankment integrity and trail user safety. Specifically, where a recreational trail is present, no tree in Zone 2B will be allowed to remain within a specified distance between from the edge of travel way in accordance with AASHTO guidelines for recreational trails.[76] Select vegetation may be retained only on the landward side of the embankments in Zone 2B and Zone 3.~~

- ~~Assuming the tree (> 3" DBH) vegetation is not an invasive species, is healthy, is not a danger tree, is appropriately located, and falls within Zones 2B or 3, it would be a candidate for preservation. No trees located within Zone 2A which lands on the canal side of the center line of the embankment crest, or in Zone 1 will be allowed to remain.~~

- ~~In areas where there is a very wide Zone 2B relative to embankment height, vegetation should be preserved to the greatest extent possible, whether or not the embankment section falls within a threshold area.~~

- ~~If it is determined that no suitable trees exist in these zones, compatible vegetation (pollinators and supplemental plantings) would be installed in Zones 2B and 3 following the plant list of suitable species found in the *Guide Book*.~~

- ~~Where stone lining occurs within the viewshed of the trail or waterway a blend of standard dolomite stone and Medina stone or some other suitable stone would be installed above the normal waterline to minimize the visual impact. This would match treatment in other historic sections of the canal. High priority areas for this treatment would be similar to those recommended for selective vegetation management — popular sections of the trail and urbanized population centers that have a community, civic, and development pattern focus on the canal.~~

3.10 Historic and Archaeological Resources

Congress documented a concern for historic preservation in 1906, when the Antiquities Act was passed. It provided for the protection of historic and prehistoric remains and monuments on federal lands. This was affirmed six decades later, in the opening of the National Historic Preservation Act of 1966:

[76] *Guide for the Development of Bicycle Facilities 2012*, Fourth Edition, American Association of State Highway and Transportation Officials (AASHTO).

"The Congress finds and declares that

(1) the spirit and direction of the Nation are founded upon and reflected in its historic heritage;
(2) the historical and cultural foundations of the Nation should be preserved as a living part of our community life and development in order to give a sense of orientation to the American people;
(3) historic properties significant to the Nation's heritage are being lost or substantially altered, often inadvertently, with increasing frequency;
(4) the preservation of this irreplaceable heritage is in the public interest so that its vital legacy of cultural, educational, aesthetic, inspirational, economic, and energy benefits will be maintained and enriched for future generations of Americans."

In 1980, the New York State Historic Preservation Act of 1980 was enacted, implementing article 14 of the Parks, Recreation and Historic Preservation Law. It established historic preservation as state policy, established the State Register of Historic Places and expanded historic preservation environmental review to include undertakings by state agencies. The review of undertakings by state agencies is conducted under NYCRR Part 428 of Section 14.09 of the Parks, Recreation and Historic Preservation Law.

The NYSCC plans to enter into a Programmatic Agreement (PA) with the Advisory Council on Historic Preservation and the New York State Historic Preservation Office (SHPO) to implement a Historic Properties Management Plan (HPMP) for managing historic resources in the New York State Barge Canal National Historic Landmark (NHL). The HPMP has been designed to address both the federal and state laws and regulations applicable to the NHL as well as ensure the involvement of both federal and state agencies in the implementation of the HPMP.

The New York State Canal System is important not only to New York State history, but to the nation's history as well, and the project area falls within the designated New York State Barge Canal Historic District, the New York State Barge Canal National Historic Landmark, the Erie Canalway National Heritage Corridor, and the seven State Heritage Corridors. National Heritage Areas (NHAs) are designated by Congress as places where natural, cultural, and historic resources combine to form a cohesive, nationally important landscape. National Heritage Area entities collaborate with communities to determine how to make heritage relevant to local interests and needs. Through public-private partnerships, NHA entities support historic preservation, natural resource conservation, recreation, heritage tourism, and educational projects. In December 2000, the Erie Canalway National Heritage Corridor Act (PL 106-544, Title VIII) was adopted by Congress. This designation applies to all 234 municipalities adjoining the 524 miles of navigable waterway that comprise the New York State Canal System, which includes the project area for EEIP activities.

Similar to a National Heritage Area, the New York State Heritage Area System (formerly known as the Urban Cultural Park System) is a state-local partnership established to preserve and

develop areas that have special significance to New York State. The EEIP project area contains seven New York State Heritage Areas consisting of the Western Erie Canal Heritage Corridor, Seneca Falls Urban Heritage Area, Syracuse Urban Heritage Area, the Mohawk Valley Heritage Corridor, Schenectady Urban Heritage Area, River Spark Urban Heritage Area, and Whitehall Urban Heritage Area. The State Heritage Areas are shown on along with the Erie Canalway National Heritage Corridor in relation to the project area and to each other.

For purposes of this section, the distinguishing features of these entities is that the State and National Heritage entities promote historic preservation (along with tourism, education, natural resource protection and recreation), while the review and consultation under the State and National Historic Preservation Acts promotes public policy and provides procedures for reviewing actions that may have an impact on historic resources. Additional information regarding the Erie Canalway National Heritage Area and the State Heritage Areas may be found in Section 3.9 and Section 3.16.

3.10.1 Environmental Setting

The project area includes the New York State Barge Canal Historic District, which was listed on the National Register of Historic Places on October 15, 2014. The Historic District was listed as a National Historic Landmark (NHL) on January 23, 2016. Historic features included in the Historic District are subject to review under the National and State Historic Preservation Act. Pursuant to the State Historic Preservation Act, state agencies are required, to the fullest extent practicable, consistent with other provisions of the law, to avoid or mitigate adverse impacts to historic properties, to fully explore all feasible and prudent alternatives and to give due consideration to feasible and prudent plans which would avoid or mitigate adverse impacts to such properties. Designation as an NHL is defined as a resource possessing "exceptional value as commemorating or illustrating the history of the United States." An NHL places a higher level of restriction and care on federal agencies considering undertakings that may adversely affect the NHL.

From the National Register Registration Form, the New York State Barge Canal Historic District includes 155 contributing buildings and 397 contributing structures. Buildings include lock powerhouses, lockhouses, oil houses, sheds, shops, and terminal facilities. Structures include locks, guard gates, dams, movable dams, spillways, waste weirs drain gates, retention dams, culverts, and drydocks. It is important to note that the Period of Significance for the New York State Barge Canal Historic District is 1905 to 1963. There are other resources from earlier versions of the canal and feeder systems that may be contributing to the historic district; however, such resources may be listed and/or eligible for the National and State Registers on their own merit and thus subject to the requirements of the federal and state Historic

Preservation Acts .[77] The Barge Canal was designed for self-propelled vessels; that is, generally barges towed by tugboats or motorized canal boats, and, thus, did not require the towpaths of earlier canals.

The New York State Barge Canal Historic District was nominated for registration under the following National Register Criteria:

- Criteria A. Property is associated with events that have made a significant contribution to the broad patterns of our history; and

- Criteria C. Property embodies the distinctive characteristics of a type, period or method of construction or represents the work of a master, or possesses high artistic value, or represents a significant and distinguishable entity whose components lack individual distinction.

In the land-cut sections, the district boundary was drawn to include the watered section and a narrow strip of land on either bank. The boundary expands to include locks, culverts, bridges, terminals, canal shops and, on the down-hill side of embankments, canal-related features that are essential for canal operations and maintained as part of the system.

Canal or feeder "embankments" are not identified on the National Register Registration Form as a contributing element. However, the boundary of the New York State Barge Canal Historic District was generally drawn at the outside toe of the embankments, and the embankments are generally considered to be part of the historic district/NHL. There are also features within the historic district/NHL boundary that are individually listed on the National Register of Historic Places.

Besides the historic district/NHL, there are other historic resources located adjacent to the historic district/NHL boundary. These resources are shown in the Cultural Resource Information System (CRIS) maintained by the New York SHPO.[78] The CRIS website also shows areas which are archaeologically sensitive (having potential to include archaeological resources).

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[77] Constructed between 1905-1918, the Barge Canal waterways are direct successors to the canals that New York State first built during the 1820s. In the western part of the state, with a few notable exceptions, the Erie division of the Barge Canal was largely built on top of the earlier original Erie and Enlarged Erie alignments. In other parts of the state, nineteenth and twentieth century channels were created parallel to the originals. However, in central New York, the Erie division of the Barge Canal followed rivers and lakes that took it as much as a dozen miles north of its nineteenth-century route.

[78] "Cultural Resource Information System (CRIS)," New York State Office of Parks, Recreation and Historic Preservation, accessed December 3, 2020, https://parks.ny.gov/shpo/online-tools/cris/.

3.10.2 Potential Impacts of Proposed Action

As introduced above, NYSCC will utilize the HPMP for managing historic resources in the New York State Barge Canal NHL in compliance with applicable federal and state cultural resources laws and regulations. To accomplish this, the NYSCC will designate an Agency Preservation Officer (APO) who is responsible for overseeing, to professional standards, the implementation of the HPMP. Among their responsibilities, the APO will coordinate the review of potential effects of project operation, maintenance, and construction activities on historic properties and maintenance of records that document review and decision-making. The APO may designate these responsibilities to a professional who meets the Secretary of the Interior's Professional Qualification Standards identified in 36 CFR Part 61.

The APO or APO's designee will also be responsible for:

- Compilation, organization, maintenance, and protection of the confidentiality, as needed, of information on the Project's historic properties. This includes but is not limited to inventory forms and maps, cultural resource inventory reports and maps, archaeological sensitivity maps, and any cultural resource and geographic information system (GIS) databases.

- Coordination of and participation in appropriate consultation with SHPO and other stakeholder groups

- Provision for suggestions of appropriate cultural resource information in programs for public interpretation and education and for staff training

- Provision for curation of any artifacts and documentation that may be collected

The HPMP will define criteria for using a streamlined process for the review of potential effects on cultural resources. In the draft HPMP, the process is described in terms of the consultation process of Section 106 of the National Historic Preservation Act with the understanding that this process also applies to a review under Section 14.09 of the Parks, Recreation and Historic Preservation Law, which would be used where there is no federal agency involvement. In this process, the APO or APO's designee, in consultation with appropriate NYSCC/NYPA staff, would determine whether the proposed undertaking is an activity listed as an undertaking eligible for streamlined review. This review would include the identification of the Area of Potential Effect (APE). The APO or APO's designee would then identify historic properties within the APE.[79] The next step would be for the APO or APO's designee to evaluate the effect of the proposed

[79] If there are properties that have not been previously evaluated for eligibility for the National Register, or if the SHPO has not concurred, the undertaking would not be accomplished under the HPMP streamlined process.

undertaking by applying the Criteria of Adverse Effect as set forth in 36 CFR 800.5(a). Finally, the APO or APO's designee would document the findings as per the terms of the HPMP.

Until the HPMP is available, or where the HPMP streamlined process is not appropriate for the undertaking, the APO or APO's designee would coordinate consultation with the SHPO, any appropriate Tribal Historic Preservation Officers and other federal and state agencies. This includes archaeological review of ground-disturbing activities, which applies to many of the EEIP activities. This will include documentation of any previous (less than 50 years) disturbance. If such disturbance cannot be documented, the procedure continues to require a Phase IA review report that is to be filed with the SHPO. In situations where a permit is required from a federal agency, the federal agency would need to concur with the determination made by the APO or APO's designee and SHPO in order to complete the process in Section 106 of the National Historic Preservation Act.

It is anticipated that once the HPMP is adopted, most EEIP activities would be reviewed and cleared by the APO or APO's designee as part of the streamlined process documented in the HPMP. Both the streamlined process and the Section 106 consultation process take into account direct, indirect and cumulative impacts.

The removal of trees should not be considered an effect/impact on the New York State Barge Canal Historic District. During the period of significance (1905 to 1963) the earthen embankments for the Barge Canal had just been constructed, and any trees developed after that time. (See Fig. 3.9-1 below.) The criteria for listing (Criteria A and C as stated above) did not include trees or historic landscapes. In fact, in addition to undermining the structural integrity of the earthen embankment resource, there is potential that trees are obscuring views of some of the contributing features to the district in addition to compromising the integrity of the earthen embankments.

Some of the EEIP activities include the clearing of trees and reconstruction of the earthen embankment in order to restore the integrity of the earthen embankment. In so doing, the EEIP activity would be restoring the earthen embankment. The National Park Service defines restoration as the act or process of accurately depicting the form, features, and character of a property as it appeared at a particular period of time by means of the removal of features from other periods in its history and reconstruction of missing features from the restoration period. The removal of the trees and reconstruction of the earthen embankments may be done as a treatment of a historic property and would be a beneficial effect to the historic district/NHL.

3.10.3 Potential Impact of Alternatives

Under the Null or No-Action Alternative, any earthen embankments would be ~~left to fail~~ at greatest risk of failure compared to other alternatives. Prior to any such failure, there would be little or no measurable impact to historic and archaeological resources inside or outside of the earthen embankments. At such time that the embankments would fail, water contained within

the canal prism would be rapidly released. Depending on the location of the breach the surrounding area would be inundated to various depths depending on topography. A breach in a canal or feeder embankment as described in Section 3.6.3 would have the potential to cause serious damage to and/or destroy downstream historic and archaeological resources.

Under the Ad-Hoc Alternative or Project-by-Project Approach, the ultimate impact to historic and archaeological resources would be similar to that of the proposed action. The difference would be in timing of the impacts. Under the EEIP program, the EEIP activities would be planned and executed proactively, while under the Ad-Hoc Alternative, the EEIP activities would be commenced when conditions become unsafe, increasing the potential for a breach over that of the proposed action.

3.10.4 Mitigation

Avoidance of historic and archaeological resources is not available, since most of the embankments are within the New York Barge Canal Historic District/NHL. Most contributing features to the district are structures; however, EEIP activities are limited to earthen embankment structures (see Section 1.3.2).

One of the items in **Table *1.3-1*** is:

> "Where historic resources listed or eligible for inclusion in the State or National Registers of historic places, are located on or in close proximity to NYSCC property where EEIP activities are contemplated, and the maintenance activities would result in determination of an adverse effect on the historic resource by the Agency Preservation Office or the SHPO."

Were this threshold to be met during the HPMP review, the APO or APO's designee would determine that the streamlined review would not be appropriate, and the APO or APO's designee would coordinate a review with the SHPO under Section 106 of the National Historic Preservation Act or Section 14.09 of the State Historic Preservation Act. The threshold requires that the consultation result in a SHPO determination of "adverse impact/effect" on resources listed in or eligible for inclusion in the State and/or National Registers.

In situations where the threshold applies to planned EEIP activities, the alternative procedures described in Section 1.3.4, including those in **Figure *1.3-3***, would be followed. In such cases, the solution may involve the implementation of engineered solutions such as a cutoff wall or canal liner. The alternative solution may need to be covered under a separate SEQR review. If alternative solutions cannot be developed for the situation, the mitigation for the activity would be developed in accordance with the national/state historic preservation processes and under a separate SEQR review.

In summary, potential impacts to historic structures would be minimized such that the EEIP activities would have "No Adverse Impact/Effect" on historic resources. In situations where specific proposed EEIP activities would result in an adverse effect, the procedures in Section 1.3.4 would be followed such that there are no adverse effects or mitigation would be developed under a separate SEQR and historic preservation review.

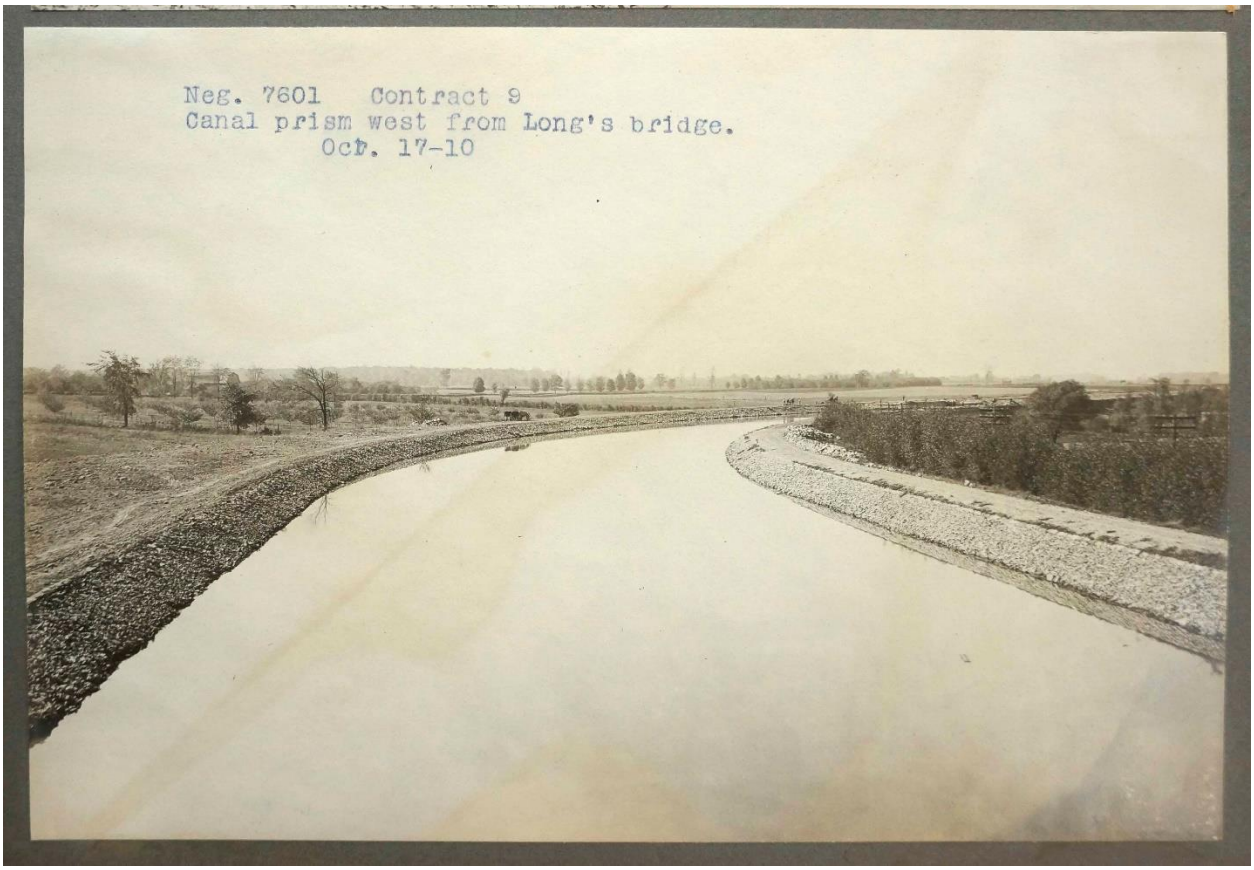

Figure 3.10-1: Treeless Earthen Embankments During the Period of Significance

3.11 Open Space and Recreation Resources

Impacts on open space and recreation may result from implementation of the EEIP. This includes temporary interruptions in the usage of the trail system, open space and other recreational resources along the Canal System during EEIP maintenance activities. Potential permanent changes in recreational resource conditions include potential to alter informal/ unauthorized uses of NYSCC embankment areas or to reduce shading provided to trail users. Beneficial permanent changes may also occur due to improved safety conditions upon completion of EEIP maintenance activities.

To assess such impacts, NYSCC would consider information about the recreational resources while planning EEIP activities for individual sections ~~on a segment-by-segment basis~~ prior to

commencing a particular EEIP activity ~~project~~. This information includes how the recreational resource is used, volume of use, times of use, and other recreational opportunities or alternatives in the area. NYSCC would also consider information about informal recreational uses on or adjacent to the EEIP project areas, including informal means to connect, access, or enhance designated recreational areas. EEIP projects may also serve to improve public accessibility and recreational safety in certain areas of associated trails. As such, coordination with various stakeholders, including municipalities, would be conducted on a project-by-project basis.

With respect to open space, while EEIP activities would be implemented in already developed areas, information about impacts on ecosystems in adjacent undeveloped and/or open areas would be considered and evaluated. This step would also involve coordination with local, state, and/or federal agencies.

NYSCC would consider information that includes the New York State Outdoor Recreation System, Statewide Comprehensive Outdoor Recreation Plan, Empire State Trail (EST) along with regional and local trail and recreational use documentation.

The EEIP does not include significant provisions for, nor is it intended to address, expansion of the EST, changing the trail surfacing, improving safety or providing amenities for recreational uses. Any major recreational-based improvements would be considered under separate SEQR actions. Restoration of existing trail surfacing to the same extents after construction, as they existed prior to construction with the same or equivalent surfacing material that exists, would be part of the EEIP. In addition, in some locations NYSCC may install guide railings and hand railings in accordance with AASHTOs *Guide for the Development of Bicycle Facilities*.

3.11.1 Environmental Setting

EEIP activities would occur along an expansive system of multi-use trails designated as the EST. The EST, an initiative established in January 2017, encompass approximately 750 miles of corridor extending from Buffalo to Albany as well as New York City to Canada. The EST includes proposed EEIP maintenance areas located along the Erie Canal as well as the Champlain, Cayuga-Seneca, and Oswego Canals. In addition, portions of towpath trails of the Old Erie, Black River, Chenango and Old Champlain Canals are also used as recreational features.

The Canalway Trail, transecting Upstate New York in an easterly/westerly direction between the City of Buffalo (Erie County) and the state capital, Albany (Albany County), spans approximately 300 miles and passes through a number of cities, towns, and villages with various points of recreational attractions. Various areas of open and/or undeveloped lands intersect embankments or are located adjacent to the Canalway Trail. This land is frequently owned and managed under municipal, private-owners, and/or county park offices rather than NYSCC.

The Erie Canalway Trail, initially developed for industrial purposes, has transformed into a popular year-round destination for mixed-use recreational use including but not limited to biking, running, walking, cross country skiing as well as access to boat-launching sites. It is noted that fishing, while allowed in the canal, is prohibited on canal structures and is prevented by physical barriers such as steep grading, privately owned land, as well as active highways and railroads.

Parks and historic sites that intersect embankment areas include, but are not limited to, the following provided by the New York State Office of Parks, Recreation, and Historic Preservation:

- Canal Park Lock 32 in Monroe County
- Fort Ontario State Historic Site in Oswego County
- Seneca Lake State Park in Ontario/Seneca County
- Green Lakes State Park in Onondaga County
- Mohawk River State Park in Schenectady County
- Schoharie Crossing National Historic Landmark in Montgomery County
- Old Erie Canal State Historic Park in Onondaga/Madison/Oneida Counties

The Canalway Trail is predominantly composed of a stone dust surface ideal for multi-recreational use. While less common than the stone dust surface, the Canalway Trail is surfaced with asphalt in and near cities, towns, and villages. As discussed in Section 3.12, the recreational trails are predominantly located on the crest of an embankment with access roads and vehicle parking areas along the outboard base of an embankment.

A number of recreational events also occur annually along the Canalway Trail to achieve objectives and goals of the Erie Canalway National Heritage Corridor Preservation and Management Plan. For example, Cycle the Erie Bike Tour, a leisure bike ride to appreciate New York's history and culture, is organized by New York State Parks and Trails and occurs in mid-July.

In addition, in 1995, the New York State Canal Recreationway Commission developed the New York State Canal Recreationway Plan to launch "the next chapter in the canal system's story." The Canal Recreationway Commission developed the following vision:

- Transform the Canal System into a recreationway which will bring the waterfront heritage from an earlier era into the 21st century.
- Interpret and conserve natural resources of the Canal.
- Magnify the presence of the Canal System through appropriate development.

3.11.2 Potential Impacts of Proposed Action

EEIP activities, in addition to potentially impacting the EST or other towpath trails, may impact public parks that are collocated on NYSCC lands or located adjacent to embankment areas. EEIP

activities are not contemplated to significantly impair the recreational function of these public parks primarily because there will be no changes to the existing trail systems, either the EST or trails in the public parks. Although tree removal and potential grading activities may require pathway restoration, the restoration would be provided to the same extents as the existing surfacing.

Impacts include short-term interruptions in recreational use of the trail system, open spaces, and other resources which would prevent public use of the trails and/or open spaces. Recreational use would likely be detoured temporarily, but not permanently during EEIP activities. Such EEIP maintenance activities are not anticipated to detrimentally affect recreational use of the trail system long-term due to a general scope involving clearing of trees and excess vegetation, embankment grading, and placement of fill material. EEIP maintenance may benefit recreational use long-term by creating safer trails through surface restoration as well as the addition of guide railing and hand railing in selected locations.

As stated in Section 3.12, work zone traffic control plans would be included with EEIP activities that affect trail recreational operations. In addition to trail closure signs and barricades, advance warning signs would be provided to allow bicyclists and pedestrians to exit the trail, and detour routes for trail users provided. Furthermore, EEIP activities involving excavations would be conducted during the non-navigation season (typically May 1 through October 31) when trail use is typically reduced.

This review has determined that there are no direct permanent impacts from EEIP activities, nor are permanent indirect or cumulative impacts anticipated.

3.11.3 Potential Impact of Alternatives

Under the Null or No-Action Alternative, earthen embankments would be ~~left to fail~~ at greatest risk of failure compared to other alternatives and possibly become a safety hazard to recreational use of the trail and intersecting open areas before needed repairs are appropriately addressed. Likewise, recreation would also be halted during embankment repair for an undetermined amount of time as repairs are completed. This No-Action Alternative contrasts with the controlled, temporary maintenance impacts to recreational trails as part of the proposed EEIP.

Under the Ad-Hoc Alternative or Project-by-Project Approach, the ultimate impact to recreational use and open spaces along the embankments would be similar to that of the proposed action. The difference would be in timing of the impacts. Under the EEIP program, the maintenance would be planned and executed proactively, while under the Ad-Hoc Alternative, the maintenance would be commenced when conditions become unsafe, increasing the potential for a breach over that of the proposed action. In addition, the ad-hoc approach has the potential for greater impacts than the EEIP actions, because emergency repairs may be necessitated as the canal and feeder embankments deteriorate. With emergency repairs, the

impact to recreational use and open spaces may not be appropriately evaluated prior to commencement of repair activities. Also, emergency repairs may require canal shutdown during the navigation season and may have a greater effect on recreational trail use than an efficiently planned and scheduled embankment maintenance operation.

3.11.4 Mitigation

To minimize unnecessary disruption to recreation use during EEIP activities, NYSCC would evaluate recreational resources of the segment of the trail system where work is proposed. As stated in the introduction to this section, data would be collected on how a recreational resource is used, the volume of recreational use, times of use, and other recreational opportunities or alternatives in the area prior to work commencement. NYSCC would also initiate early communication and coordination with stakeholders near the proposed maintenance work, such as the respective municipality, regulatory agency, and/or community organizations (see Sections 9 and 10 of the *Guide Book*). For example, coordination with the respective municipality to locate safe detours for pedestrians and bicyclists would occur in this coordination stage, prior to initiation of maintenance work. This would allow for appropriate dissemination of information for proposed EEIP work and mitigation of potential issues with recreational user safety and satisfaction as well as open space regulations.

Timing the projects appropriately during the year also serves to avoid disruption to recreational use, including state-wide events. For instance, work completed during the winter is less likely to affect boaters as well as pedestrians and bicyclists than during warmer seasons.

In general, with appropriate interagency coordination and public notification, recreational use and open spaces will not be permanently affected by EEIP and further mitigation would not be required.

3.12 Transportation Resources

Transportation facilities that may be impacted by EEIP activities include longitudinal elements parallel to the canal:

- Waterway navigation on the canal
- Pedestrian and bicycle traffic on the Erie Canalway Trail or other trails that typically occupy the former towpath of a canal
- Vehicular transportation — state, county and local roads as well as municipal parking facilities

Other transportation facilities cross the canal and embankments, including rail, vehicular and pedestrian/bicycle bridges. The EEIP activities are expected to have no impact on bridge crossings over the canal. Bridges either span over embankments, or the abutments replace the embankment section at the bridge.

The EEIP activities are not expected to permanently increase pedestrian or bicycle traffic on recreational trails nor include construction of new paved areas for vehicular, bicycle, pedestrian or other uses, or otherwise impact access to existing roadways. The EEIP activities may include temporary changes to existing pedestrian or bicycle accommodations, temporary changes to Canal System navigation, and temporary detours of vehicular traffic in order to bring construction materials and remove stumps from the work site.

3.12.1 Environmental Setting

The Erie Canalway Trail is a network of approximately 300 miles of multi-use trails that parallels the canal, principally between Buffalo and Albany. Other segments parallel sections of the Champlain, Cayuga-Seneca and Oswego Canals. The trails are used for biking, walking, jogging and other seasonal activities. Trailhead parking areas are located at intervals along the trail. Trails and other pedestrian/bicycle resources are often considered as recreational resources. However, they may also be used as an alternative form of transportation. For example, there are portions of the Erie Canalway Trail that are used by bicyclists and pedestrians for commuting to work.

Trails are typically located on the crest[80] of an embankment. Trails primarily consist of a stone dust surface with some asphalt segments. Local or Canal System access roads may also be located along the outboard base of the embankment, along with trail access parking areas.

3.12.2 Potential Impacts of Proposed Action

Some potential impacts to the Erie Canalway Trail may result from EEIP activities, such as providing a uniform width stone dust trail where the actual width was less than the NYSCC trail design standard or replacing a small section of stone dust trail with asphalt or vice versa. These incidental activities, to improve uniformity of the trail, would have inconsequential permanent impacts on transportation. Where trails must be reconstructed due to EEIP embankment repairs or other EEIP activities, they would be reconstructed "in-kind" to the same width and grade as the existing trail section, with restored subbase and either a stone dust or asphalt surfacing to match the existing surface. It should be noted that such actions on the Erie Canalway Trail performed independent of EEIP activities would be considered as SEQR Type II activities. For example, replacing a narrow stone dust segment of trail with a wider asphalt trail would be considered a SEQR Type II action in accordance with 6 NYCRR 617.5. Thus, much more extensive trail modification activities undertaken by NYSCC are processed as Type II projects under SEQR so the trail modifications anticipated under the EEIP would be expected to have no significant effect under SEQR.

[80] See Figure 1.3-1.

The potential impacts of the proposed action would be largely temporary in nature. They may include temporary trail closures — with the rerouting of bicycle and pedestrian traffic, where deemed safe and feasible, due to EEIP maintenance activities. These may include clearing of trees and vegetation, grubbing to remove deep rooted plants, embankment grading, placement of stone filling filter material, seeding, replanting of compatible vegetation, restoration of paved and stone dust surfaces and other activities associated with the EEIP as identified in the *Guide Book*. Temporary closures may also occur at canal or local roadways or parking facilities for use as staging areas, or to transport products, raw materials or construction and demolition materials. Temporary use of local roadways or parking facilities for access or staging would be accomplished by negotiation with the respective municipality or facility owner by the NYSCC or by a contractor.

Where temporary trail closures are required, work zone traffic control would be done in accordance with NYSDOT Standard Sheet 619.0. All work zone traffic control, including signs, barriers, pavement markings and related work, would be in place prior to the temporary closure or detour. Work zone traffic control plans would be included with EEIP activities that affect trail operation. In addition to trail closure signs and barricades, advance warning signs would be provided to allow bicyclists and pedestrians to exit the trail.

Temporary closure to boat traffic, although anticipated to be rare, may be required for some EEIP maintenance activities that occur during navigation season. In the event of EEIP maintenance activity that affects waterway traffic, closure signs and advance warning signs would be posted, as well as messaging through the Notice to Mariners (NTM) system, to advise boaters. EEIP activities are much more likely to occur during the non-navigation season when the canal is drained and there would be no impact on boat traffic. Restoration of slope protection on the inboard side of the canal prism is a Best Management Practice for the *Guide Book*. It consists of providing an 18-inch protective layer of riprap on the inboard slope. If this activity is undertaken during the navigation season, temporary closure to boat traffic at the affected section may be necessary. In cases where temporary closure of the canal is not required, warning signage and buoys may be provided for boaters to alert them to the construction activities.

In evaluating EEIP activities that could affect existing navigation access and/or pedestrian or bicycle accommodations, NYSCC would consider information about transportation uses of the Canal System both on water and land, and how activities may result in temporary alterations in the pattern of movement of people or goods. Information to be reviewed would include navigational usage data, real estate records, and adjacent or contiguous roadway maps. These temporary changes would not be recurring at a frequency that would likely cause a significant adverse impact but may be a consideration in scheduling of activities under the EEIP. Any effect on transportation facilities due to EEIP activities would be temporary, and no transportation facilities would be permanently affected or impaired.

3.12.3 Potential Impact of Alternatives

Under the Null or No-Action Alternative, any earthen embankments would be ~~left to fail~~ at greatest risk of failure compared to other alternatives. Similar to a dam, that failure would rapidly release a large volume of water. Prior to any such failure, there would be no measurable impact to transportation uses within or adjacent to the canal right-of-way. At such time that the embankments would fail, water contained within the canal prism would be rapidly released. The risks associated with such an event are described in Appendix B. Depending on the location of the breach, the surrounding area would be inundated to various depths depending on topography. A breach in a canal or feeder embankment having a water depth of 12 feet is estimated to occur over 1½ hours, enlarge to 150 feet wide and discharge a peak flow of between 5,000 and 10,000 cfs.

Although dams and embankments are managed under separate programs by the NYSCC, they have many common means and methods for BMPs. The purpose of the EEIP is to have a proactive program to monitor and maintain canal and feeder embankments, similar to any dam, to avoid deterioration and hazards to life and property resulting from a no-action alternative.

The resulting flood wave would seriously impact transportation uses in its path. Recreational use of the trail on the embankment would be curtailed during the flood and repairs. Navigation traffic would also be suspended at the affected breach and for additional canal length between isolation gates or temporary cofferdams. Depending on the location and extend of flooding, state and local highways and railroads could be adversely affected. In addition to potential loss of life, transportation infrastructure would be rendered unusable until restoration projects were completed.

Under the Ad-Hoc Alternative or Project-by-Project Approach, the ultimate impact to transportation use along the canal and feeder embankments and waterway traffic would be similar to that of the proposed action. The difference would be in timing of the impacts. Under the EEIP program, the maintenance would be planned and executed proactively, while under the Ad-Hoc Alternative, the maintenance would be commenced when conditions become unsafe, increasing the potential for a breach over that of the proposed action. In addition, the ad-hoc approach has the potential for greater impacts than the EEIP actions, because emergency repairs may be necessitated as the canal and feeder embankments deteriorate. Emergency repairs may require canal shutdown during the navigation season and may have a greater effect on recreational trail use and waterway traffic than an efficiently planned and scheduled embankment maintenance operation.

3.12.4 Mitigation

Temporary impacts can be avoided by scheduling EEIP activities for the non-navigation season when there is no boat traffic, and trail usage is reduced. If EEIP work must be done during the navigation season, temporary navigation closures may be required.

Minimization of temporary closures can be accomplished by scheduling trail or navigation closures for the minimum time necessary for accomplishing the work and allowing public access to the work area to resume under safe conditions. Where there are local roads or streets that are suitable for bicycle and pedestrian use, NYSCC would coordinate with the local municipality to use the local roads or streets to bypass the work area as a temporary detour. If there are no roads nearby that can suitably accommodate bicycle and pedestrian traffic, or the local municipality does not approve of this use, then the trail would be closed temporarily. Closure signs would be placed, as well as advance warning signs for trail users. In summary, activities under the EEIP would continue to use the practice of temporary trail closures when necessary, and detours where feasible.

Mitigation of temporary closures would consist of restoration of the stone dust or asphalt trail surface, base course, and associated drainage to pre-construction conditions or better. Within the waterway, restoration would consist of restoring the canal prism to its original cross section.

Travel advisories are currently posted on the NYSCC website for temporary closures of either trails or boat traffic due to embankment maintenance activities, and this practice would be continued in the future.

In summary, EEIP activities are not expected to have any permanent impacts on bicycle or pedestrian recreational or commuter traffic, or on waterway navigation along the canal. Temporary closures of transportation facilities would continue the existing practice: limited in time and extent, with public notice given in the form of construction closure advisories.

3.13 Noise, Odor and Light

Direct and indirect impacts on noise, odor and light may occur due to implementation of the EEIP. These effects may be temporary or permanent in nature. Removal of vegetation has the potential to increase audibility of sound and visibility of light from existing noise sources due to the loss of vegetation through implementation of the EEIP. These changes may result in changes in the visibility of light or audibility of sounds emanating from the Erie Canal Heritage Trail or beyond. Although effects on odors is discussed in this section, the potential effects on odors from implementation of the EEIP is judged to be negligible.

3.13.1 Environmental Setting

Noise

Noise can be described as unwanted sound that may interfere with communication or may disturb a community. Three characteristics of noise have been identified as being important to analyzing subjective community response to noise:

- Intensity
- Frequency
- The time-varying characteristics of the noise

Intensity is a measure of the magnitude or energy of the sound and is directly related to pressure level. The human ear is capable of sensing a wide range of pressure levels. Pressure levels are expressed in terms of a logarithmic scale with units called decibels (dB). As the intensity of a noise increases, it is judged to be more annoying. A 10-decibel increase in sound levels is typically judged by the listener to be twice as loud as the original sound. Conversely, a 10-decibel reduction is typically perceived as half as loud. An increase in sound levels of 3 decibels is considered to be the smallest change to the A-weighted sound level that people, without specifically listening for a change, can notice. An increase in sound levels of 5 decibels is perceptible and tolerable by humans as noted in Table B of *Assessing and Mitigating Noise Impacts* (NYSDEC, 2001) and other references, and reproduced as **Table *3.13-1*** below. It is necessary to use a method of measure that will account for the time-varying nature of sound when studying environmental noise. The equivalent sound pressure level (L_{eq}) is defined as the continuous steady sound level that would have the same total A-weighted sound energy as the real fluctuating sound measured over a given period of time. As a result, the three characteristics of noise combine to form a single descriptor (L_{eq} in dB(A)) that helps to evaluate human response to noise.

Table 3.13-1: Human Reaction to Increases in Sound Pressure Level

Increase In Sound Pressure Level (dB)	Human Reaction*
Under 5	Unnoticed to tolerable
5 – 10	Intrusive
10 – 15	Very noticeable
15 – 20	Objectionable
Over 20	Very objectionable to intolerable

Reference: Down and Stocks, 1978

*For purposes of this GEIS, based on the above, a noise impact will be considered as an increase in noise levels of more than 5 dB.

The number, types, and locations of noise sources and several factors that influence the propagation of noise influence the noise level that's perceived by people. The noise environment in the project area varies significantly and is primarily influenced by nearby noise sources including: adjacent land uses and their associated activities; transportation corridors; and housing density. Numerous environmental factors determine the level or perceptibility of noise at a given point of reception. These factors include: distance from the noise source to receptor; the surrounding topography; acoustical properties (acoustically hard versus acoustically soft surfaces) of the ground; number, density and height of buildings; dense vegetation that may be located between noise sources and people; time of day; season of the

year (for indoor activities); wind direction; temperature gradient; and relative humidity. Noise is likely to be a matter of concern to adjacent residential and outdoor recreational land uses.

The daytime ambient noise environment, measured as L_{eq}, can range from under 50 dBA in rural locations to 80 dBA in noisy urban environments. The U.S. Department of Transportation has developed a national, multimodal transportation noise mapping initiative that uses data sources from the Federal Aviation Administration (FAA) and Federal Highway Administration (FHWA) to create a comprehensive map of noise levels from transportation sources.[81] Other researchers have associated population density with outdoor noise levels.[82]

As noted in the above referenced documents, existing noise levels in the project area will be significantly influenced by the population density and the presence of noise generating transportation corridors. Existing noise levels may also be influenced by industrial, commercial, retail, mining, and agricultural land uses and associated activities. Over the entire NYSCC project area, existing noise levels can be expected to vary significantly due to the above referenced factors.

Consideration is given to both the potential temporary noise impacts associated with construction noise and indirect permanent impacts resulting from removal of existing dense vegetation. Since an increase in towpath trail recreational traffic is not anticipated, due to implementation of the EEIP, only potential indirect impacts associated with removal of existing dense vegetation need to be considered. The combinations of loud noise sources and noise sensitive receivers potentially of concern may include:

- Noise receivers on the side of the embankment adjacent to where removal of tall, dense vegetation could increase noise levels from existing noise sources on the other side of the canal.
- Noise receivers on the other side of the canal from where removal of tall, dense vegetation could increase noise levels from existing noise sources adjacent to where embankment vegetation removal is being performed.
- Situations where sources and receptors are adjacent to an embankment on the same side of the canal along a curve where a direct line is opened from the vegetation removal.

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81 Bureau of Transportation Statistics, login required, https://maps.bts.dot.gov/arcgis/apps/webappviewer/index.html?id=a303ff5924c9474790464cc0e9d5c9fb.

82 Catherine M. Stewart, William A. Russell, Jr., and George A. Luz, "Can Population Density Be Used to Determine Ambient Noise Levels?" U.S. Army Center For Health Promotion and Preventive Medicine, Environmental Noise Program, accessed December 4, 2020, http://www.conforg.fr/acoustics2008/cdrom/data/fa1999-berlin/FILES/PDF/1P/1PNSA__5.PDF.

Odor

The *SEQR Workbook* states:

> An odor is a chemical in the air that is "smelled" or sensed by our nose (olfactory system). Odor can be a significant environmental concern related to manufacturing, food processing, composting, landfills, and institutional or municipal facilities such as water and wastewater treatment plants.[83]

Light

The SEQR Workbook states:

> Outdoor lights have the potential to cause light pollution and glare. Light pollution is excessive and inappropriate artificial light. Problems associated with excessive or inappropriate outdoor lighting include sky glow (a brightening of the night sky over inhabited areas), light trespass (light falling where it is not intended, wanted, or needed), glare (excessive brightness which causes visual discomfort or decrease visibility) and clutter (bright, confusing, and excessive groupings of light sources). Adverse effects of light pollution include disruption of biological rhythms, impact on nocturnal wildlife, lowered visibility, and wasted money and energy. Glare can also be particularly hazardous to drivers. Projects may include general lighting for parking lots and buildings, safety lighting for walkways, or lighting for signs, landscaping and flagpoles.[84]

Given that light pollution results from artificial, rather than natural light, only the effects of EEIP activities on artificial lighting are considered. Since the EEIP does not include provisions for new lighting of the towpath trail, only indirect impacts associated with removal of existing dense vegetation need to be considered.

3.13.2 Potential Impacts of Proposed Action

Direct Impacts

Noise

The potential impacts of the proposed action may include temporary and permanent noise level increases. Temporary noise impacts may result from the various maintenance activities associated with the EEIP, and the construction and maintenance equipment used to perform

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[83] "Question 15 - Impact on Noise, Odor, and Light - Full EAF (Part 2): Full Environmental Assessment Form (FEAF) Workbook," New York State Department of Environmental Conservation, accessed December 4, 2020, https://www.dec.ny.gov/permits/91786.html.

[84] "FEAF Workbook," New York State Department of Environmental Conservation.

those activities. There are three major categories of noise sources for any construction operation: (1) fixed equipment or process operations; (2) mobile equipment or process operations; and (3) transport movements of products, raw materials or waste. The activities may include clearing of trees and vegetation, grubbing to remove deep rooted plants, embankment grading, placement of stone filling filter material, seeding, restoration of paved and stone dust surfaces, mowing of turf grass and other activities associated with the EEIP as defined in the *Guide Book*. A list of some of the construction equipment that may be used in various EEIP activities, percent usage and reference noise levels is provided in **Table *3.13-2***.

Table 3.13-2: Construction Equipment Reference Noise Levels

Construction Equipment	Usage (%)	Reference Noise Levels *Noise Level (dB(A))*
Material Handling		
Crane	16	81
Equipment (Earth Moving)		
Drill Rig	20	79
Excavator	40	81
Front Loader	40	79
Back Hoes	40	78
Dozers	40	82
Tractors	40	84
Dump Truck	70	77
Paver	50	77
Roller	20	80
Compactor (ground)	20	83
Stationary Equipment		
Pumps	50	81
Generators	50	81
Compressors	40	78
Impact Equipment		
Pile Drivers	20	101
Jackhammers	20	89
Rock Drills	20	81
Other		
Saw	20	80

Note: Reference noise levels at 50 feet are obtained from the FHWA Roadway Construction Noise Model

Depending upon the specific equipment in use, the number and locations where construction operations are occurring, and the proximity of sensitive noise receivers to the construction operations, temporary noise level increases in excess of 5 dBA are possible from time to time. Since, however, the details of contractors' operations and equipment are not well known during the design phase of a project, it is not realistically possible to accurately estimate potential noise

level increases during construction, however standard construction Best Management Practices would be used such as ensuring properly maintained and muffled equipment, construction during day light hours. These and other measures are described in the *Guide Book* and Section 3.13.4 below.

Implementation of the EEIP will result in no increases in noise producing activities within the NYSCC right-of-way, and no increases in noise levels, as the permanent actions taken under the EEIP are not expected in increase the use of the canal or embankment areas or produce any new noise generating activities. Given this finding, it is highly improbable that the proposed action could, by removing vegetation from the embankments, result in noise levels that are above those established by local regulations.

Odor

Temporary effects on odor resulting from implementation of EEIP activities may occur from construction equipment and earthmoving activities. The EEIP activities would not generate any odors other than temporary odors released from equipment during construction and earthmoving activities or ongoing, regular operations, such as mowing, which may occur two to three times each growing season. These effects are likely only when construction activity is occurring. Permanent effects on odors for more than one hour of the day are anticipated to be none or negligible.

Light

Temporary effects on artificial lighting, resulting from implementation of EEIP activities, are unlikely as construction activities, other than emergency construction, will occur during daytime hours, and will not require lighting. Provision of additional lighting of the Erie Canal Trailway is not a part of the EEIP and thus there will be no permanent direct impacts from new lighting features along the canal.

Indirect Impacts

Noise

Permanent indirect noise impacts may result from removal of dense vegetation; however, the influence of dense vegetation in reducing noise levels must meet very high standards to be considered to have a significant influence on noise levels. Furthermore, deciduous dense vegetation is only effective during the growing season. The FHWA has given clear direction to state highway departments that states may not use vegetation for noise abatement for federally funded highway improvement projects. Thus, the Transportation Noise Model (TNM) that FHWA requires for use in evaluating highway noise on federally funded highway projects has incorporated an algorithm that relates the attenuation provided by trees to the distance through dense trees. The FHWA guidance is summarized in National Cooperative Highway Research

Program Report 25-34, *Supplemental Guidance on the Application of FHWA's Traffic Noise Model,* Appendix I – Tree Zones (NCHRP 2014).

Figure *3.13-1* below shows that over 200 feet of dense trees is needed to provide 5 dB of attenuation. There are very few locations in the NYSCC system where the distance between the shoulder break of the embankment and the NYCC-owned property line approaches a distance of 200 feet. In one of the highest embankment sections on the Erie Canal system, the "Great Embankment" near where Irondequoit Creek crosses under the Erie Canal, in Pittsford, NY, the height of the towpath above the surrounding ground is approximately 65 feet, and the distance from the outside shoulder break of the canal embankment to the base of embankment is approximately 180 feet. It is possible, therefore, that there could be lines of sight between noise sensitive active use areas in this residential community that exceed 200 feet and have significant opacity due to the tall, dense existing vegetation. The embankment in this area is forested, and there is a residential neighborhood on the north side of Marsh Road. For the loss of vegetation to have a noise impact, there needs to be a noise source that is presently obscured by the vegetation. In this neighborhood, New York State Route 96, located on the south side of the canal embankment, is a significant noise source. However, in this case, even if the forested portion on the north side of embankment is cleared, the embankment itself will still behave as an earth berm noise barrier, providing significant all-season noise reduction of New York State Route 96 and other noise sources. Based on this worst-case example, the effects of loss of tree vegetation on noise levels in the residential neighborhood north of Marsh Road are expected to be unnoticeable to tolerable.

So, although it is possible that throughout the project area there are lines of sight from noise receivers through tall, dense vegetation that may exceed 200 feet, towards one or more noise sources, the removal of such vegetation is unlikely to increase noise levels by more than 5 dBA at any receiver. Thus:

- No indirect noise impacts are anticipated from EEIP activities.
- Any incidental noise mitigation benefits provided by existing tall, dense vegetation that would be removed are only present during the growing season.
- Even when dense vegetation is removed, the canal or feeder embankment itself will still be present and capable of functioning as a noise barrier.
- The embankment slopes will remain acoustically "soft," will not reflect noise, and will provide soft ground attenuation.
- It is highly improbable that the proposed action could, by removing vegetation from the embankments, result in noise levels that are above noise levels established by local regulations.
- As discussed in Section 1.3.4, the NYSCC is not subject to procedural or substantive requirements of Community Plans, local laws, etc.

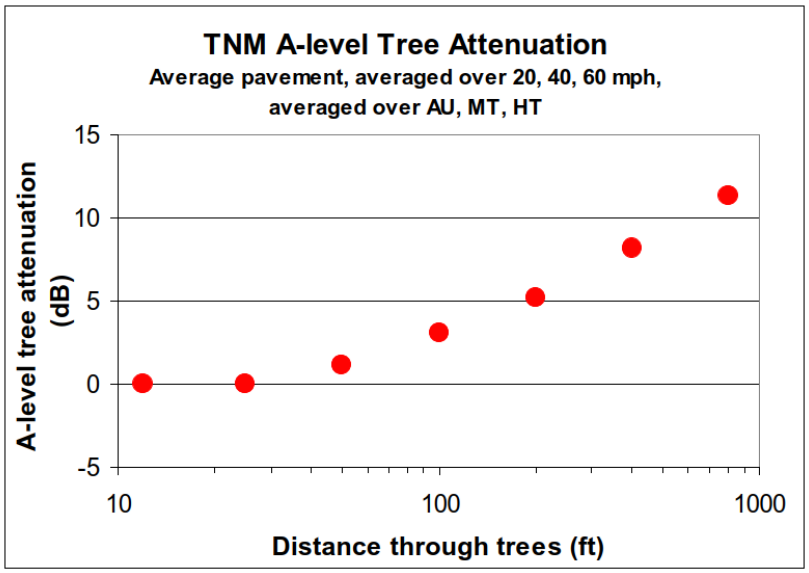

Figure 3.13-1: A-Level Attenuation (dB) for TNM Vehicles

Odor

The potential for indirect temporary impacts to odor are possible but unlikely. Construction operations could result in temporary trail and local road closures that may reroute local road traffic, resulting negligible increases to odor. While some plants can remove or control indoor odors, it is not reasonable that outdoor vegetation that would be removed as part of EEIP activities would constitute an indirect impact, given the open air and changing wind patterns.

Light

Permanent effects on lighting may result from the loss of vegetation which, during the growing season, may serve to obscure or block artificial lighting along either side of the canal or beyond the project area. The extent of the effects may in some cases be noticeable to affected facilities, particularly residential neighborhoods.

The NYSCC will, on a project-by-project basis perform an artificial light pollution evaluation in places where:

- There are locations adjacent to the project area that could be adversely affected by significant existing artificial light sources during nighttime hours. Such locations would only include places that are occupied overnight by humans during nighttime hours. These include residential land uses whether single family, or multi-family units; and
- The proposed removal of dense vegetation under the EEIP would significantly increase light pollution in these residential areas.

These locations will be determined on a project-by-project basis by conducting a nighttime light survey during the growing season. A light meter will be used as appropriate to obtain existing lighting levels. This process will also be informed by the project's public outreach program.

Cumulative Impacts

Since major reconstruction of the Erie Canal system in 1918, patterns of community and industrial development, industrial economic decline, expansion of residential development to rural areas, and other demographic conditions have resulted in both increases and decreases in noise, odor and light within and adjacent to the project area. The cumulative changes to noise, odor and light over time are judged to be greater than the changes in noise, odor and light that may result from the proposed action, therefore it is concluded that the potential for cumulative impacts would be restricted to the potential for direct and indirect impacts, which have been demonstrated to be insignificant.

3.13.3 Potential Impact of Alternatives

Under the Null or No-Action Alternative, any earthen embankments would be ~~left to fail~~ at greatest risk of failure compared to other alternatives. Prior to any such failure, there would be no measurable temporary or permanent impact to noise, odor and light within the canal right-of-way or at adjacent properties. At such time that the embankments would fail, water contained within the canal prism would be rapidly released. The risks associated with such an event are described in Appendix B. Depending on the location of the breach, the surrounding area would be inundated to various depths depending on topography. A breach in a canal or feeder embankment having a water depth of 12 feet is estimated to occur over 1½ hours, enlarge to 150 feet wide and discharge a peak flow of between 5,000 and 10,000 cfs. The resulting flood wave would seriously impact existing land uses for the inundated terrain outside the canal limits. In addition to potential loss of life and damage to infrastructure, most of the flooded lands would be rendered unusable until restoration projects were completed. Impacts of odors could be particularly noticeable as a result of indirect impacts of flooding such as the growth of mold and from backed up storm and sanitary sewers.

Under the Ad-Hoc Alternative or Project-by-Project Approach, the ultimate impact to noise, odor and light outside of the earthen embankments would be similar to that of the proposed action. The difference would be in timing of the impacts. Under the EEIP program, the maintenance would be started in a planned and predictable manner, while under the Ad-Hoc Alternative, the maintenance would be commenced when conditions become unsafe, increasing the potential for a breach over that of the proposed action. In addition, the ad-hoc approach has the potential for greater impacts than the EEIP actions, because emergency repairs may be necessitated as the canal and feeder embankments deteriorate. Emergency repairs may require canal shutdown during the navigation season and may have a greater effect on adjacent land use and stormwater management than an efficiently planned out embankment maintenance operation.

3.13.4 Mitigation

Although permanent, indirect noise increases resulting from removal of tall, dense vegetation cannot be avoided or minimized, they have been demonstrated in the previous section to be unnoticed to tolerable in almost all situations. There may be unique situations; however, where the line of sight between a noise source and receiver is at such an acute angle that a stand of tall, dense vegetation blocking the direct line of sight could exceed 200 feet. The NYSCC will conduct a screening of individual embankment projects for lines of sight exceeding 200 feet between sensitive adjacent noise receivers and loud noise sources to identify any situations that meet those requirements. For situations that meet the requirements, calculations and noise measurements, as appropriate, will be performed and impacts documented. Mitigation for permanent indirect noise impacts cannot be provided and unavoidable impacts will occur in those instances.

The NYSCC recognizes that amenities may serve to diminish the rare unavoidable impacts mentioned above and the perception of increased noise levels or changes to the character of sound as a result of EEIP activities involving the removal of vegetation. These amenities include replacement vegetation in Zones 2B and 3 of the earthen embankments. This zone covers the upper 1/3 of the outboard slope of the embankment. Although the lower 2/3 of the outboard slope of the embankments would be vegetated with turf to assure that seepage and stability of the embankment can be monitored in the future, the upper 1/3 of the embankment could be planted with a combination of Vegetative Screening Plantings (i.e., compatible vegetation) and Pollinator Plantings. In intermittent locations, individual trees may remain on the embankment in Zones 2B and 3 or for projects where thresholds are exceeded, where they have been evaluated through a rigorous review process to be safe to remain.

The NYSCC is committed to implementing a series of temporary noise mitigation techniques, during EEIP implementation, that have been modified from the NYSDEC noise guidelines (NYSDEC, 2001). The noise mitigation techniques given below are listed according to what sound characteristic they mitigate. These practices should be employed to the maximum extent practicable to lessen the potential temporary noise impact to nearby noise sensitive receptors.

1. Reduce noise frequency and impulse noise at the source of generation by:
    - Replacing back-up beepers on machinery with strobe lights (subject to other requirements, e.g., OSHA and MINE Safety and Health Administration, as applicable). This eliminates the most annoying impulse beeping.
    - Use appropriate mufflers to reduce the frequency of sound on machinery that pulses, such as diesel engines and compressed air machinery.
    - Changing equipment: using electric motors instead of compressed air driven machinery; using low speed fans in place of high-speed fans.
    - Modifying machinery to reduce noise by using plastic liners, flexible noise control covers, and dampening plates and pads on large sheet metal surfaces.

2. Reduce noise duration by:
   - Limiting the number of days of operation, only working during business days and non-holidays, and restricting the hours of operations between 7 a.m. and 6 p.m. can reduce noise increases.
3. Reduce noise sound pressure levels by:
   - Increasing setback distances
   - Moving equipment during operations further from noise sensitive receptors
   - Substituting quieter equipment
   - Using mufflers selected to match the type of equipment and air or gas flow on mechanical equipment
   - Ensuring that equipment is regularly maintained
   - Phasing operations to preserve natural barriers as long as possible.

Where local noise ordinances have been enacted, the NYSCC will make all reasonable attempts to comply with the substantive requirements of local noise ordinances. Public notification of upcoming loud events should also be considered as a form of mitigation, although it does not physically reduce the noise or perception of the noise.

3.14 Human Health

EEIP activities may impact human health when implemented in or near areas having existing or potential sources of contaminants. Potential sources include but are not limited to state and federal Superfund sites (inactive hazardous waste sites), state and federal Brownfield sites, Petroleum Bulk Storage/Chemical Bulk Storage facilities, RCRA-listed facilities, and active and closed landfills. Materials from adjacent properties could migrate to NYSCC properties or could have been mistakenly left or placed within NYSCC property. Therefore, screening for hazardous and contaminated materials should be done prior to performing work on an embankment segment if any portion of a reach includes excavation or temporary property acquisition.

To assess these potential impacts, NYSCC would identify, address, and mitigate potential impacts to public and to worker health during EEIP activities. This screening process is also discussed in the ~~*NYSCC Embankment Inspection & Maintenance*~~ *Guide Book*.

The identification process would include but not be limited to the following:

- Review of locations and identification of sensitive receptors, as defined by the U.S. EPA and NYSDEC, and which includes schools, convalescent facilities such as hospitals, licensed daycare centers, senior centers, group homes, nursing homes, and retirement communities within 1,500 feet of potential EEIP activity areas
- Data search of potential EEIP activity areas and adjacent areas for locations undergoing remediation, completed emergency spill remediation, or a completed environmental site remediation

- Review of NYSCC internal information about any instances of unearthed solid or hazardous waste on or adjacent to EEIP implementation areas
- Pesticide usage, including safety data sheets (SDS) and regulatory guidance, in proximity to residential, recreational and other areas where potential human health could be impacted.

Based on sensitive receptor findings, NYSCC would review existing listed sites and/or facilities with known contaminants within a ½ mile and/or the applicable search distance of the embankment segment(s) to determine potential impacts on human health. The review would follow guidelines established by the New York State Department of Transportation (NYSDOT) The *Environmental Manual, Section 4.4.20 Contaminated Materials and Hazardous Substances* which is a modified form of the American Society for Testing and Materials (ASTM) in the *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process/Designation, E1527-13 (ASTM Standard Practice E1527-13*).

The Director of Environmental Health and Safety would be consulted with respect to specific information required for screening. The screening would provide site-specific information for the embankment segment and include but not be limited to the following three (3) components that are evaluated per ASTM and NYSDOT guidelines:

- Review of public and reasonably ascertainable records;
- Site Reconnaissance or visit to the project corridor; and
- Interviews with current and former owners, employees and occupants of the property, and local government officials such as firefighters, building code enforcement officers, and local health department staff.

The screening should include conclusions that summarize the findings of the assessment and recommendations for dealing with each finding. After reviewing the screening report and observing the project location or corridor, the Director of Environmental, Health & Safety may determine that additional information is needed to adequately evaluate the segment, determine the contaminant levels at an area of concern (AOC), or fill in information gaps about possible or suspected contamination. A Phase II Environmental Site Assessment (ESA) can confirm the presence of hazardous substances or petroleum byproducts, help determine the type(s), extent, and magnitude of contamination and allow for an accurate estimate of costs that will be associated with the required remediation. A Phase II ESA includes a surface and subsurface evaluation to identify the nature and extent of impacts. Media samples, such as surface and subsurface soil, groundwater, soil vapor, and/or surface water are frequently obtained during Phase II ESA in order to analyze for potential contamination.

3.14.1 Environmental Setting

Due to the historic industrial and commercial use of the canal and immediately surrounding communities, numerous facilities/sites with known and/or potential contamination are located within ½ mile of canal and feeder embankments. Such facilities include but are not limited to

state and federal Superfund sites, state and federal Brownfield sites, PBS/CBS facilities, and active and closed landfills. Contaminants frequently associated with these facilities include:

- Chlorinated solvents
- Fuel oils
- Pesticides
- Polycyclic Aromatic Hydrocarbons (PAHs)
- Heavy Metals (i.e. lead, mercury, arsenic)
- Polychlorinated Biphenyls (PCBs)
- Emerging contaminants such as per- and polyfluoroalkyl substances (PFAS)
- Urban fill material comprised of asbestos-containing material (ACM)

To assess the potential impacts to human health where EEIP activities are conducted near an identified source of contamination, NYSCC would refer to Section 8 of the *Guide Book* – Hazardous and Contaminated Materials Assessment.

3.14.2 Potential Impacts of Proposed Action

The EEIP activities themselves would not generate materials that would affect human health. When conducted according to appropriate safety measures, the EEIP activities would not jeopardize the health of those performing the activities or those in adjacent areas.

Potential impacts of EEIP activities may include worker and/or public exposure to impacted and/or hazardous material in the vicinity of EEIP activities if due diligence is not completed prior to activity commencement. Such due diligence, as discussed in Hazardous and Contaminated Materials Assessment in Section 8 of the *Guide Book*, will prevent human exposure by identifying and implementing preventative measures prior to EEIP activities at each location.

If appropriate screening is not completed, exposure to contaminated materials and/or hazardous materials may result in acute and chronic adverse health effects with respect to the worker and surrounding community.

3.14.3 Potential Impact of Alternatives

~~Under the Null or No-Action Alternative, earthen embankments would fail and potentially~~ Under the Null or No-Action Alternative, any earthen embankments would be at greatest risk of failure compared to other alternatives and have greater potential to cause disturbance of contaminated and/or hazardous material if present and if not already appropriately contained. Such disturbance may result in human exposure and subsequent adverse health effects. Therefore, this alternative presents risk to human health as there would be no proactive approach to identifying, delineating, and handling contaminated and/or hazardous materials near earthen embankments.

The Null or No-Action Alternative also presents a safety hazard due to inundation of the surrounding area if a breach were to occur. A breach would affect surrounding residences and roads as well as cause other emergency conditions. Recreational use of embankments would also become a risk under the Null or No-Action Alternative. This includes the risk to trail users from "danger trees" that have been known to fall and injure trail users.

Under the Ad-Hoc Alternative or Project-by-Project Approach, the potential for exposure to contamination or hazardous materials would be similar to the proposed action. The difference would be in timing of the impacts. Under the EEIP program, the maintenance would be planned and executed proactively, while under the Ad-Hoc Alternative, the maintenance would be commenced when conditions become unsafe, increasing the potential for a breach over that of the proposed action.

3.14.4 Mitigation

If contamination and/or hazardous materials are identified near a planned EEIP activity and potential community and/or worker exposure is identified during the screening process, NYSCC would implement preventive or corrective measures prior to the start of work as well as involvement of appropriate environmental professionals and regulatory authorities, if applicable. Such measures may include preparation of an Environmental Management Plan (EMP) and/or Soil Management Plan (SMP) for identification, testing, and disposition of impacted soils/solid waste prior to or during EEIP activities. The purpose of the EMP/SMP is to discuss procedures to manage potential environmental conditions in accordance with applicable federal, state, and local regulations, including New York State Department of Environmental Conservation (NYSDEC) Division of Environmental Remediation (DER)-10. The EMP/SMP would be intended to provide guidance to minimize EEIP activity delays as a result of addressing environmental conditions within the activity area.

Corrective measures may include remedial actions or removal of hazardous materials prior to disturbance of the area. This may involve removal of petroleum or solvent impacted soil as well as ACM, lead-based paint (LBP), or PCBs abatement pursuant to all applicable federal, state, and local regulations. Such measures would be overseen by an appropriately certified environmental professional.

3.15 Community Plans

As noted in Section 1.3.4, the NYSCC will utilize Community Plans to help assess whether site specific proposed earthen embankment maintenance activities will have the potential for significant adverse impacts that require the NYSCC to avoid, minimize, or mitigate to the extent practicable. New York State Canal Law authorizes the NYSCC to maintain the 524 linear miles of Canal System and infrastructure which pass through hundreds of cities, towns, and villages. The

NYSCC is not subject to procedural or substantive requirements of Community Plans, local laws, etc., as complying with hundreds of different local laws would make maintaining earthen embankments in a safe manner impossible and unduly prejudices the NYSCC when it comes to implementing its statutory authority.

Certain land-altering or construction activities under the EEIP, in some communities, may:

- Significantly damage an aesthetic resource of local importance;
- Have a significant adverse effect on aesthetic resources of statewide significance; or
- Be inconsistent with an approved Local Waterfront Revitalization Program (LWRP).

Land-altering or construction activities as noted in Section 1.3.4 may be significantly inconsistent with Community Plans. For this reason, the NYSCC has developed a process set forth in Section 1.3.4 and the *Guide Book* to review readily available Community Plans during the conceptual and predesign phase of site-specific earthen embankment activities to identify such significant adverse impacts. The remainder of this section discusses and answers the questions about Community Plans; how they can provide guidance to assess potential impacts; and help in identifying where mitigation measures may be important to consider and incorporate into the projects.

3.15.1 Environmental Setting

The most common type of municipal plan is the Land Use Plan, or the Comprehensive Plan. State statutes define a Comprehensive Plan as "the materials, written and/or graphic, including but not limited to maps, charts, studies, resolutions, reports and other descriptive material that identify the goals, objectives, principles, guidelines, policies, standards, devices and instruments for the immediate and long-range protection, enhancement, growth and development"[85] of the municipality.

A Comprehensive Plan need not be a single document nor formally adopted.[86] Examples of Comprehensive Planning absent a formal adopted plan include: a zoning law; environmental reviews and findings; legislative findings relating to adoption of a law or ordinance; minutes of the legislative body; studies; and a previously adopted plan.

Land use regulations, such as zoning, subdivision, special-use permit or site plan regulation, must be in accordance with the Comprehensive Plan. A Comprehensive Plan may have sections that highlight the preservation of trees, vegetation clearing controls, and/or natural resource protection, which will assist in determining whether EEIP activities could have a potentially significant adverse impact on a community.

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[85] Village Law, §7-722(2)(a); Town Law § 272-a(2)(a); General City Law § 28-a (3)(a).

[86] *Neville v. Koch, supra*.

Other Community Plans to consider include the Capital Improvement Plan, Open Space Plan/Community Forest Management Plan, Stormwater Management Plan, Hazard Mitigation Plan, Historic Preservation Plan, Local Waterfront Revitalization Plan, and Watershed Management Plan.

Capital Improvement Plans (CIP) prioritize and schedule public physical improvements for communities over certain periods of time. As the provision of public facilities shapes local development patterns, the CIP is an important tool in implementing the community's vision as established in the Comprehensive Plan and ensuring that growth occurs in line with community goals.

Municipalities can use Open Space Plans to assess the importance of its open space resources, or to include an assessment of open space resources as part of its Comprehensive Plan (see Section 3.11). Open Space Plans outline strategies for the use and conservation of priority lands and serves to complement and inform the local Comprehensive Plan. A community decides how to categorize and use its open space resources by examining their use and function within the community (e.g., parks, trails, greenways, cemeteries, forests, wetlands, etc.) and setting priorities for their protection. These amenities come together with the developed land to provide community character (see Section 3.16).

A natural resources inventory is the implicit foundation for an open space inventory (OSI) and serves to identify and describe naturally occurring resources. An OSI lists important lands in the community according to priority for conservation or acquisition and displays them on an open space map. An OSI is often developed within a broader open space plan. As such, a community's OSI can assist in determining whether EEIP activities could have a potentially significant adverse impact on aesthetic resources of local importance. State enabling legislation directs Conservation Advisory Councils (CACs) and Conservation Boards (CBs) to prioritize open areas in a municipality for conservation based on natural, scenic, and cultural values through the OSI process. When a local legislature adopts the open space inventory and map prepared by the CAC, the inventory becomes the official open space index for the municipality. Erie County has created a Natural Resource Inventory (NRI) Story Map that identifies and describes important naturally occurring and protected resources within the County.

In addition to a natural resource inventory and OSI, a municipality can also develop a tree inventory. The NYSDEC Urban and Community Forestry Grants provide funding opportunities for municipalities, quasi-governmental entities, and Not-For-Profit Corporations to develop a tree inventory, management plans, tree maintenance and tree planting**.** A tree inventory includes locations, species, condition, and management needs. A survey is necessary in order to develop a (community forest) management plan (CFMP). A tree inventory can serve as a beneficial tool to mitigate EEIP activities that could involve tree removal. A management plan creates a vision for the long-term community forest management, and develops strategies,

budgets and plans to meet that vision. For example, the City of Syracuse has an Urban Forest Master Plan (2020).

A Stormwater Management Program (SWMP) Plan is developed to comply with Part IV.A. of the NYSDEC General Permit for Stormwater Discharges from Municipal Separate Storm Sewer Systems. SWMP Plans need to follow the *New York State Stormwater Management Design Manual* (2015), which stipulates that the design and layout of stormwater management features are conducted in unison with site planning and green infrastructure objectives. This includes the avoidance or minimized disturbance to natural features and the use of conservation design techniques. Regulated Municipal Separate Storm Sewer Systems (MS4s) are required by law to include all six minimum control measures (MCM) in their programs. For each MCM, they must set goals and select activities that will reduce pollution to the maximum extent practicable, must make special provisions to protect water bodies already impaired by pollution, and must report annually to NYSDEC. Local laws adopted by regulated MS4 municipalities must:

- Require review of post-construction stormwater management measures in SWPPPs (see Section 3.2)
- Require for post-construction stormwater control a combination of stormwater management practices consistent with technical standards in the *New York State Stormwater Management Design Manual*
- Establish responsibility for and ensure ongoing maintenance of structural or non-structural management measures needed to control post-construction stormwater.
- Include inspection of stormwater management measures and practices, compliance and enforcement

Municipalities are considered traditional MS4s because they have land use control and development and are required to adopt local laws such as Stormwater Management and Erosion & Sediment Control to follow EPA's Phase II Stormwater Rule. The NYSCC is considered a Non-Traditional MS4 because it does not have control of land use and development, such as review of private construction plans like a municipality.

The purpose of the Stafford Disaster Relief and Emergency Assistance Act (Stafford Act), as amended by the Disaster Mitigation Act of 2000, is "to reduce the loss of life and property, human suffering, economic disruption, and disaster assistance costs resulting from natural disasters." Section 322 of the Act specifically addresses mitigation planning and requires state and local governments to prepare multi-hazard mitigation plans as a precondition for receiving Federal Emergency Management Agency (FEMA) mitigation project grants. The purpose of mitigation planning is to identify local policies and actions that can be implemented over the long-term to reduce risk and future losses from hazards. These mitigation policies and actions are identified based on an assessment of hazards, vulnerabilities, and risks and the participation of a wide range of stakeholders and the public in the planning process. Flooding is the primary natural hazard in New York State, causing millions of dollars' worth of damage to homes and

businesses each year. New York State is vulnerable to both inland and coastal flood hazards, with ninety percent of New York State's population residing in waterfront communities. *New York State's 2019 Hazard Mitigation Plan* (2019 SHMP) was approved by FEMA on December 17, 2018 and exists on the Mitigate NY planning website. There are twelve counties in the project area with current HMPs.

A Historic Preservation Plan is a proactive means of planning for the preservation and protection of a community's character and historic resources. The preservation plan is a formal written document that reconciles policies and procedures regarding the community's historic resources with other community goals. The *New York State Historic Preservation Plan 2021-2026 ~~2015–2020~~* guides preservation efforts at the local, regional and state levels, but does not provide any constitutional and statutory authority. A local preservation plan can be used as the basis for the community's preservation program and may be adopted as an element of the community's Comprehensive Plan. Not many municipalities have a local historic preservation plan. Instead, a municipality usually adopts a local landmark law, historic district overlay zoning, or some other type of an architectural design control local law that provides for the protection of locally-designated historic resources and/or resources listed on the State and National Register of Historic Places. As the New York State Canal System has been designated a National Historic Landmark (see Section 3.10), many canal communities may have a local preservation plan, or element in their Comprehensive Plan, that identifies the Erie Canalway and protects the historic community character along the corridor. Section 3.16 will further discuss the goals of federal and state canal plans, such as the Erie Canalway Preservation and Management Plan and the NYSCC's Canal 2025: Canal Recreationway Plan Update.

In partnership with the New York State Department of State (NYSDOS), and in accordance with the New York State Waterfront Revitalization of Coastal Areas and Inland Waterways Act (New York State Executive Law, Article 42), the Local Waterfront Revitalization Program (LWRP) serves to coordinate local and State actions needed to achieve the community's goals for its waterfront. The State Barge Canal System is a designated inland waterway, as per Executive Law, Article 42, Section 911 (Coastal Waterbodies and Designated Inland Waterways, revised December 2019). The LWRP may be comprehensive and address all issues that affect a community's entire waterfront, or it may address only the most critical issues facing a significant portion of its waterfront. Working in partnership with the Division of Coastal Resources, a community reaches consensus on the future of its waterfront, establishes local policies and outlines the implementation techniques it will use to achieve its vision. The following policies of the New York State Coastal Management Program are relevant to activities under the EEIP:

- Policy 7 — Significant coastal fish and wildlife habitats will be protected, preserved, and where practical, restored so as to maintain their viability as habitats (see Section 3.7).

- Policy 9 — Expand recreational use of fish and wildlife resources in coastal areas by increasing access to existing resources, supplementing existing stocks, and developing new resources (see Sections 3.7 and 3.11).
- Policy 23 — Protect, enhance and restore structures, districts, areas or sites that are of significance in the history, architecture, archaeology or culture of the state, its communities, or the nation (see Section 3.10).
- Policy 24 — Prevent impairment of scenic resources of statewide significance (see Section 3.9). There are two Scenic Areas of Statewide Significance (SASS): the Hudson River Valley Scenic Areas of Statewide Significance (1993) and the East Hampton Scenic Areas of Statewide Significance (2010). The Hudson River Valley coastal region consists of Columbia, Greene, Dutchess and Ulster counties, and there are nine areas totaling more than 25,000 acres on Long Island's East End within the Town and Village of East Hampton.

The LWRP is the only planning and regulatory tool that allows a local community to refine statewide coastal policies to apply to the local situation. According to 19 CRR-NY 600.3, "No State agency involved in an action shall carry out, fund or approve the action until it has complied with the provisions of article 42 of the Executive Law." Article 42, § 919. Coordination of state actions and programs, states that "the secretary shall review actions proposed by state agencies which may affect the achievement of the policies of this article and shall make recommendations to such agencies with respect to achievement of such policies." The following Erie Canalway communities have NYSDOS-approved LWRPs:

- City of Amsterdam (Montgomery County)
- Town of Clay (Onondaga County)
- City of Little Falls (Herkimer County)
- Village of Macedon (Wayne County)
- Village of Middleport (Niagara County)
- City of North Tonawanda (Niagara County)
- City of Oswego (Oswego County)
- Town/Village of Pittsford (Monroe County)
- City of Rochester (Monroe County)
- Town/City of Tonawanda (Erie County)
- Town/Village of Waterford (Saratoga County)
- Town of Wheatfield (Niagara County)
- Village of Whitehall (Washington County)

For example, the *Town and Village of Pittsford LWRP* (2006) provides the following policy statement about natural resource protection:

Policy 1.3 Maintain and enhance natural areas, recreation and open space

The preservation of significant open space areas should continue to be pursued. The concept of a ribbon of green along the canal, should be incorporated into all existing and new projects. For example, in existing commercial areas, the expansion of green space and planting areas can be used to improve the aesthetic nature of the site. In new projects, open space should be required as an integral component of the design scheme, rather than a remnant of the development process. This may be accomplished using buffer areas between different land uses, cluster development, incentive zoning and the transfer of development rights.

A Watershed Management Plan defines and addresses existing or future water quality problems from both point sources and nonpoint sources of pollutants. Watershed Management Plans allow communities to integrate water resource protection and restoration with growth management at the local level, balancing environmental and economic factors. Environmental Protection Fund (EPF) LWRP grants program has awarded watershed planning and the implementation of watershed plans to numerous communities from NYSDOS.

The watershed plans approved by NYSDOS differ from the NYSDEC watershed plans, which are known as Nine Element Watershed Management (9E) Plans. 9E Plans are consistent with the U.S. Environmental Protection Agency's (EPA) framework to develop watershed-based plans. EPA's framework consists of nine key elements. The elements are intended to ensure that the contributing causes and sources of nonpoint source pollution are identified; that key stakeholders are involved in the planning process; and that restoration and protection strategies are identified that will address the water quality concerns.

There are three NYSDEC-approved 9E Plans: Genesee River Nine Element Watershed Plan, Black River Nine Element Plan, and Suffolk County Subwatershed Wastewater Plan. The Genesee River is the second largest tributary loading of phosphorus to Lake Ontario, and the 9E Plan addresses nutrient and sediment pollution within this large watershed (2,490 square miles), with a number of stormwater management measures aimed at reducing the sediment and phosphorus loads from the watershed into the Genesee River. The rationale for considering Watershed Management Plans for activities under the EEIP is that management practices such as strengthening municipal controls on development and local watershed practices are typically identified to address the sources of pollutant loads. By strengthening local controls, municipalities can achieve water quality improvement and restoration, while promoting appropriate development in the watershed. This can be done through revisions to Comprehensive Plans, zoning, site plan review, subdivision regulations, and other local laws designed to protect open space, scenic views, agricultural lands, streams, riparian areas, wetlands, steep slopes, ground water, and wildlife habitats.

The three most common techniques for the regulation of local land use in New York State are zoning, site plan review, and subdivision regulations. These tools can direct development away from sensitive areas; prevent negative environmental impacts, such as stormwater runoff that can occur with removal of vegetation; and define scenic and visual quality impacts; and protect aesthetic resources of local importance. As such, these local laws can provide guidance to the NYSCC when determining whether a particular activity at a specific embankment will have the potential for a significant adverse impact, particularly on community character and aesthetics.

Zoning commonly consists of two components: a zoning map and a set of zoning regulations. Zoning regulations describe permitted land uses in each of the various zoning districts identified on the zoning map. They also include dimensional standards for each district, such as the height of buildings, minimum setbacks from buildings to property lines, and the density of development. These are referred to as "area" standards. The type of use, and/or the zoning district, designates "use" standards such as high-, medium- or low-density residential, general commercial, highway commercial, light industrial, and heavy industrial. Overlay zoning allows a community to apply additional review requirements and standards for the protection of designated resources that may cross several zoning districts. The standards for the overlay district can be structured to address riparian buffer protection, floodplain management, stormwater management, habitat protection, or the amount of impervious cover. For example, the Town of Ogden, Chapter 300: Zoning, Article VI. Erie Canal Preservation Overlay Zone utilizes overlay zoning to preserve natural, scenic and historic values along the Erie Canal.

Site plan review is concerned with how a parcel is developed. A site plan shows the arrangement, layout, and design of the proposed use of a single parcel of land. Site plan review can be incorporated into a local zoning law or ordinance, or instead be adopted as a separate local law or ordinance. Site plan review allows communities to address a wide range of issues by incorporating standards for stormwater management, drainage, landscaping and buffering, and any other elements specified in the local site plan law or ordinance. For example, in accordance with its LWRP (2010), the Town of Waterford has adopted Article XII Waterfront Overlay District to "protect the scenic corridors along the Erie and Champlain Canal Systems and Hudson and Mohawk Rivers." This goal is also in compliance with the Town and Village of Waterford Comprehensive Plan (2016). Site plan review is required to determine compatibility with the LWRP and the Comprehensive Plan, and that "All new development shall be integrated into the existing landscape so as to minimize its visual impact and maintain the natural beauty and environmentally sensitive shoreline areas through erosion control and the use of vegetative and structural screening, landscaping and grading."

Supplementary local laws can also achieve local land use regulation and control. The following are types of "standalone" actions that are commonly taken to address specific municipal concerns.

A tree preservation ordinance is the legal framework to help protect and manage a community's trees and can develop based on a tree inventory or community forest management plan. It can be designed to regulate various aspects of tree planting, removal, and maintenance on public and private property within a municipality. The Village of Medina, Chapter 230: Trees is L.L. No. 1-2005 and has been adopted "to protect the health, safety and welfare of both the public citizenry and the trees in the Village of Medina by establishing standards and regulations to control planting, planning, removal, maintenance, protection of the trees and shrubs within the public rights-of-way and public land areas from undesirable and unsafe planting, removal, maintenance and protection practices and by eliminating and guarding against dangerous conditions which may result in injury to persons using the public areas of the Village, and by promoting the enhancement and natural beauty of the Village, as well as to prevent damage to any public sewer or water main, street, sidewalk or other public property, and to guard all trees and shrubs within the Village against the spread of disease or pests." It is important to note that the EEIP *Guide Book* is not intended to be used to create new embankments where none currently exist and the purpose of many of these local laws is to regulate new development within a community. However, these supplemental local laws can provide guidance to the NYSCC as they design specific earthen embankment maintenance projects.

Tree ordinances are an effective public policy and planning tool, especially when integrated with environmental protection such as riparian buffers. A riparian buffer is a special type of natural conservation area along a stream, wetland or shoreline where development is restricted or prohibited. The primary function of buffers is to protect and physically separate a stream, lake, coastal shoreline or wetland from polluted stormwater discharges from future disturbance or encroachment. Local ordinances can specify the width, identify the target vegetation, and designate methods to preserve the buffer, as well as the type of development permitted within the riparian buffer. The preservation of buffers is also cited in Chapter 5: Green Infrastructure Practices of the *New York State Stormwater Management Design Manual*. Riparian buffers treat stormwater and improve water quality; can be used as nonstructural stormwater infiltration zones; can keep structures out of the floodplain and provide a right-of-way for large flood events; can help to preserve riparian ecosystems and habitats; can serve as recreational areas; and may be used in runoff reduction calculations.

Through the adoption of erosion, sedimentation, and vegetation clearing controls, a community can protect development from costly damage, retain valuable soils, protect water quality, and preserve aesthetics. Such regulations are often incorporated into zoning or site plan review. A municipality can also establish such controls in a standalone law that is specifically directed at grading, filling, excavation and other site preparation activities such as the clear-cutting of trees or the removal of all vegetation. Such a law can address the issue of how construction and other activities are carried out and can include certain minimum standards. These standards can include, for example, limits on the time land can be allowed to remain in a disturbed state, land stabilization measures, stormwater management regulations, water-body protection, and Best Management Practices. A system of review can also be established to ensure compliance with

the standards. For example, the Town of Newburgh has a Clearing and Grading local law and the Town of Clarence has a Clearing, Filling and Grading local law. Many municipalities that are not designated as traditional MS4s have adopted Soil Erosion and Sediment Control local laws, especially in concert with watershed management planning efforts.

As discussed with the SWMP, a local stormwater law is another tool that communities can use in combination with basic land use tools. A stormwater law provides regulations for new development and redevelopment that require control of stormwater to reduce its negative impacts and take advantage of the use of clean stormwater as a resource, recharging local groundwater supplies, lakes, ponds and wetlands. Traditional MS4s must adopt construction and post-construction local laws to follow the EPA's Phase II Stormwater Rule. Some stormwater local laws may include a review process requiring green infrastructure planning as a regular component of development approval, which could include the use of large and small-scale green infrastructure or low impact development (LID) to manage stormwater, including stream buffers, floodplain protection and conservation of natural areas, rain gardens, vegetated swales, and green roofs.

3.15.2 Potential Impacts of Proposed Action

The two Community Plans that have the strongest constitutional and statutory foundation are the Comprehensive Plan (Town Law §272-a; Village Law §7-722; General City Law §28-a) and the Local Waterfront Revitalization Plan (Article 42). The other Community Plans discussed in this section can be interpreted as following Local Government Home Rule Power.

Once a Comprehensive Plan is adopted using the state zoning enabling statutes, all land use regulations of the community must be consistent with the Comprehensive Plan. In the future, the plan must be consulted prior to adoption or amendment of any land use regulation. In addition, other governmental agencies that are considering capital projects on lands covered by the adopted Comprehensive Plan must take the plan into consideration.

The activities of federal, state, and local government are required to be consistent with a locally adopted LWRP that has been approved by the Secretary of State. This “consistency” provision is a strong tool that ensures government agency actions at all levels are guided by the local program. Municipalities with an approved LWRP also conduct local review for local actions. State agencies conduct consistency review for state agency actions.

As previously mentioned, EEIP activities are all accomplished within land under the jurisdiction of the NYSCC. However, the NYSCC will assess whether site specific proposed earthen embankment maintenance activities may have the potential for significant adverse impacts on areas that have been identified as part of a Community Plan. These identified areas will be given consideration for the NYSCC to avoid, minimize or mitigate to the extent practicable.

3.15.3 Potential Impact of Alternatives

Under the Null or No-Action Alternative, any earthen embankments would be ~~left to fail~~ at greatest risk of failure compared to other alternatives. That failure would rapidly release a large volume of water. Prior to any such failure, there would be no measurable impact to Community Plans within or adjacent to the canal right-of-way. At such time that the embankments would fail, water contained within the canal prism would be rapidly released. The risks associated with such an event are described in Appendix B. Depending on the location of the breach, the surrounding area would be inundated to various depths depending on topography. A breach in a canal or feeder embankment having a water depth of 12 feet is estimated to occur over 1½ hours, enlarge to 150 feet wide and discharge a peak flow of between 5,000 and 10,000 cfs.

Although dams and embankments are managed under separate programs by the NYSCC, they have many common means and methods for Best Management Practices. The purpose of the EEIP is to have a proactive program to monitor and maintain canal and feeder embankments, to avoid deterioration and hazards to life and property resulting from a no-action alternative.

The resulting flood wave would seriously impact educational, historical, cultural, agricultural, recreational, coastal and natural resources; existing or the proposed location of transportation facilities, public and private utilities and infrastructure; housing resources and future housing needs, including affordable housing; and other types of land uses typically contained in Community Plans.

Under the Ad-Hoc Alternative or Project-by-Project Approach, the ultimate impact to Community Plans along the canal and feeder embankments and waterway traffic would be like that of the proposed action. The difference would be in timing of the impacts. Under the EEIP program, the maintenance would be planned and executed proactively, while under the Ad-Hoc Alternative, the maintenance would be commenced when conditions become unsafe, increasing the potential for a breach over that of the proposed action. In addition, the ad-hoc approach has the potential for greater impacts than the EEIP actions, because emergency repairs may be necessitated as the canal and feeder embankments deteriorate. Emergency repairs may require canal shutdown during the navigation season and may have a greater effect on a community's quality of life than an efficiently planned and scheduled embankment maintenance operation.

3.15.4 Mitigation

The *Guide Book* includes protocols and procedures for the NYSCC to follow when developing site specific earthen embankment projects. As noted, many cities, towns, and villages have identified goals, objectives, principles, guidelines, policies, standards, devices and instruments for the immediate and long-range protection, enhancement, growth and development of their municipality in adopted Community Plans. If an activity has the potential to cause significant adverse impact upon an aesthetic resource of local importance that has been identified by a

community plan, the NYSCC will engage stakeholders and community representatives to determine appropriate mitigation measures to avoidance, minimization, and mitigation.

3.16 Community Character

As noted in Section 3.15, the NYSCC is not subject to procedural or substantive requirements of local governments. However, land-altering or construction activities as noted in Section 1.3.4 may be significantly inconsistent with the man-made and natural features that exist along the canal corridor and in canal communities that represent distinct historical development periods. For this reason, the NYSCC has developed a process set forth in Section 1.3.4 and in the *Guide Book* to identify significant adverse impacts to existing facilities and structures, areas of historic importance, housing, community services, and public and recreational resources that altogether create the evolved community character of communities in the canal corridor during the conceptual and predesign phase of site-specific earthen embankment activities.

3.16.1 Environmental Setting

One of the most important factors in determining community character for canal communities is the importance of the Erie Canalway National Heritage Corridor (ECNHC). The ECNHC is a living national park, meaning that the Erie Canalway consists of both public and private lands and is home to Upstate New York's largest population centers: Buffalo, Rochester, Syracuse, and the state capital Albany. Eighty percent of Upstate New York residents live within 25 miles of the Erie Canal. The ECNHC is among the largest of the 49 National Heritage Areas, spanning New York State from east to west for 524 miles, encompassing all 234 municipalities linked by the Erie, Champlain, Cayuga-Seneca and Oswego Canals, and Cayuga and Seneca Lakes. In 2000, the ECNHC's authorizing legislation established a 27-member federal commission and required the development of a comprehensive management plan. The Erie Canalway National Heritage Corridor Preservation and Management Plan was approved by the Secretary of the Interior in 2006 and received the American Planning Association's Highest National Award for a Comprehensive Plan in 2008. National heritage corridors represent living traditions, with communities proud of their heritage and distinct character.

An example of community character is the history of canal town development. Many historic buildings with architectural significance are concentrated in settlements along what was once New York's major commercial artery, which was the Erie Canal. Bustling canal communities formed at areas that intersected with rural roads and waterways, such as a lock or wide water, and major railroad lines. Most of the extant historic building stock dates to the second half of the nineteenth century and are clustered in central business districts, which may be listed on the State and National Register of Historic Places as described in Section 3.11. These buildings likely served as inns and taverns, warehouses, stores, factories, and houses for travelers, canal workers, and residents.

The central business districts are located adjacent to the original canal bed, the focal point of development from the 1820s through the enlargement of the canal from 1835 to 1862 and its final conversion to the Barge Canal in the early twentieth century. Many sections of the Old Erie Canal right-of-way were merely widened, deepened, and enhanced during the creation of the Barge Canal. In other areas of the state, the Old Erie Canal was either abandoned or radically altered. Consequently, the canal still forms the core of these historic settlements and their surrounding agricultural and natural landscapes. The Villages of Holley and Medina in Orleans County, for example, took advantage of the canal's curve and embankment to obtain greater access to the waterway. Commercial development expanded along streets running north to south perpendicular to the canal in the Village of Spencerport in Monroe County, the Village of Albion in Orleans County, and the Village of Clyde in Wayne County. A significant characteristic of these canal communities is that most developed on the opposite side from the towpath, likely to keep the movement of goods uninterrupted from the animal traffic. This layout is influential on the character of the built environment and dominates the western canal corridor. Former sections of the Chenango, Old Erie, Old Champlain, and Black River Canals are also a part of the Project Area. The canal communities that developed along these abandoned canal systems where NYSCC still owns lands continue to value their canal heritage to the extent that in some community trail systems have or are being developed on the towpath, and the former canals are being partially rewatered for recreational purposes.

The western canal corridor is notable for its many commercial districts that retain their nineteenth century presence and orientation towards the Erie Canal. This is not the case for many communities outside the corridor that lost their relationship with the canal when was it reconfigured in 1862 and in 1918. The Western Erie Canal Heritage Corridor (WECHC), which includes the counties of Erie, Monroe, Niagara, Orleans, and Wayne and is a designated State Heritage Area, features the longest segment of the original Erie Canal (1817-1825) that is still in use as part of the New York State Canal System. The ECNHC spans through a section of the WECHC. While the WECHC is a countywide designation that includes the 136-mile section of the Erie Canal, the ECNHC designates specific areas along the corridor.

The New York State Heritage Area System is a grassroots partnership with state and local government, non-governmental organizations, and the private sector to preserve, develop, and promote areas that encompass the state's most significant natural, historic, and cultural resources. The program was created by state legislation in 1982 originally as the Urban Cultural Park System and delegated to the New York State Office of Parks, Recreation and Historic Protection. It has expanded to include 20 heritage areas and corridors, the most recent addition being the Niagara Falls Underground Railroad Heritage Area in 2008. Each Heritage Area is required to develop a comprehensive management plan that focuses on four heritage goals:

1. Preservation of significant resources
2. Education that interprets lessons from the past
3. Recreation and leisure activities

4. Economic revitalization for sustainable communities

Altogether, there are 19 state heritage areas with approved management plans. The following heritage areas intersect with the NYSCC EEIP project area:

- Western Erie Canal Heritage Area
- Mohawk Valley Heritage Area
- RiverSpark Urban Heritage Area
- Seneca Falls Urban Heritage Area
- Schenectady Urban Heritage Area
- Syracuse Urban Heritage Area
- Whitehall Urban Heritage Area

The Erie Canal corridor is a series of cultural landscapes that have evolved through use by the people whose activities or occupancy shaped it, and is comprised of the following types of living traditions, including:

- Towpath-era canals that reflect the original Erie, or Clinton's Ditch, completed in 1825, and the enlarged system, completed in 1862. Some of these areas may include resources for rewatering, as well as vulnerable structures such as lock chambers and aqueducts and rare intact groupings of canal-related buildings.
- 20th-century barge canals that reflect land cuts and riverways and are representative of traditional settlement patterns with commercial and recreational land uses
- Settlements, such as hamlets, villages, and cities, that contain streets and parks, historic properties, mixed use infill development, and main streets and waterfronts
- Industrial landscapes that contain natural resources and historic downtowns, with a variety of ports and harbors which have many historic water-dependent uses
- Rural landscapes that connect the canal system's historic settings and open space conservation with its agricultural heritage

Altogether, the Canal Corridor is a historic vernacular landscape that has been defined by the people whose activities or occupancy shaped that landscape. Through social or cultural attitudes of canal communities, the landscape reflects the physical, biological, and cultural character of those everyday lives. Function plays a significant role in the Corridor's vernacular landscape, which in addition to aesthetic and historic and archaeological resources, compose community character.

Additionally, as mentioned in Section 1.3.4, a community may have adopted a Comprehensive Plan that can provide guidance to NYSCC to assess potential impacts on community character. Typical elements of a Comprehensive Plan include existing and proposed educational, historical, cultural, agricultural, recreational, coastal and natural resources; existing or proposed location of

transportation facilities, public and private utilities and infrastructure; and housing resources and future housing needs, including affordable housing. A community's Comprehensive Plan will clearly define existing community character and serve as a good resource for NYSCC any potential impacts of EEIP activities.

3.16.2 Potential Impacts of Proposed Action

As previously mentioned, EEIP activities are all accomplished within land under the jurisdiction of the NYSCC. The removal of trees and other EEIP activities and those potential impacts to aesthetic resources are discussed in Section 3.9 and historic and archeological resources are discussed in Section 3.10. Community character is the cultural landscape of the canal corridor, as defined by the National and State Heritage Areas, and composed of the geographic areas associated with specific events, activities, or people. Removal of trees and/or vegetation would not have a significant impact to the corridor as a cultural landscape; in fact, removal would contribute to the restoration of the project area to its appearance by viewers on the towpath trails and viewers in the community, as a historic working landscape when the canal transformed New York City into the nation's principal seaport and opened the interior of North America to settlement. Other EEIP activities involving earthwork and filter blankets would not significantly alter the slopes of the canal and feeder embankments and thus would have an insignificant effect on the cultural landscape and community character.

3.16.3 Potential Impact of Alternatives

Under the Null or No-Action Alternative, any earthen embankments would be ~~left to fail~~ at greatest risk of failure compared to other alternatives. Such a failure would rapidly release a large volume of water. Prior to any such failure, there would be no measurable impact to Community Plans within or adjacent to the canal right-of-way. At such time that the embankments would fail, water contained within the canal prism would be rapidly released. The risks associated with such an event are described in Appendix B. Depending on the location of the breach, the surrounding area would be inundated to various depths depending on topography. A breach in a canal or feeder embankment having a water depth of 12 feet is estimated to occur over 1½ hours, enlarge to 150 feet wide and discharge a peak flow of between 5,000 and 10,000 cfs. Although dams and embankments are managed under separate programs by the NYSCC, they have many common means and methods for Best Management Practices. The purpose of the EEIP is to have a proactive program to monitor and maintain canal and feeder embankments, to avoid deterioration and hazards to life and property resulting from a no-action alternative. The resulting flood wave from a canal or feeder embankment breach would seriously impact the historic vernacular landscape of the canal corridor, including its cultural and natural resources, as well as other community character features as described in a community's Comprehensive Plan.

Under the Ad-Hoc Alternative or Project-by-Project Approach, the ultimate impact to community character along the canal and feeder embankments and waterway traffic would be

like that of the proposed action. The difference would be in timing of the impacts. Under the EEIP program, the maintenance would be planned and executed proactively, while under the Ad-Hoc Alternative, the maintenance would be commenced when conditions become unsafe, increasing the potential for a breach over that of the proposed action. In addition, the ad-hoc approach has the potential for greater impacts than the EEIP actions, because emergency repairs may be necessitated as the canal and feeder embankments deteriorate. Emergency repairs may require canal shutdown during the navigation season and may have a greater effect on a community's quality of life than an efficiently planned and scheduled embankment maintenance operation.

3.16.4 Mitigation

The *Guide Book* includes protocols and procedures for the NYSCC to follow when developing site specific earthen embankment projects. Through its cities, towns and villages, the canal links a series of cultural landscapes, which includes cultural and natural resources that are associated with specific events, activities, and/or people. These resources are unique to the canal region and are representative of the patterns of settlement, land use, and transportation as well as natural features altered by human habitation. If an EEIP activity has the potential to cause significant adverse impact upon the historical authenticity and interpretive value within the canal corridor, the NYSCC will engage stakeholders and community representatives to determine appropriate mitigation measures to avoidance, minimization, and mitigation.

4 UNAVOIDABLE ADVERSE IMPACTS

Consistent with 6 NYCRR 617.9(b)(5)(iii)(b), all draft environmental impact statements must include those adverse environmental impacts that cannot be avoided or adequately mitigated if the proposed action is implemented. As a GEIS of a program under which NYSCC activities on earthen embankments will take place, this review considers the likelihood of adverse environmental impacts of the program's full implementation. The EEIP addresses these potential impacts and provides for mitigation steps, and opportunities for NYSCC to consider alternatives. However, this section recognizes activities implemented in accordance with the *Guide Book* may pose unavoidable adverse impacts. The risk of unavoidable adverse impacts from an area of earthen embankment considers not just a single event, which may or may not have an unavoidable impact, but looks at the likelihood of the program's implementation (any action under the EEIP) having an unavoidable impact over the entirety of NYSCC's earthen embankments for the duration of the EEIP. Below is a listing of the impact analysis that identifies the potential for significant adverse impacts. There are a number of factors that are considered, individually and collectively, in this assessment of the program for which mitigation may not be adequate, including: type of location/setting/terrain, type and density of vegetation, and intrusiveness of the scope of work (intensity and duration).

Chapter 3 discusses the potential for environmental impact resulting from the EEIP described in Chapter 1 and in the ~~*NYSCC Embankment Inspection & Maintenance*~~ *Guide Book* (Appendix A).

Section 3.2 Land identifies the potential impacts to land and the water table from the EEIP activities of excavation and grading, stump removal, and construction of drainage blankets and toe drains. The cumulative impact over the years will result in the removal of a large amount of natural material (primarily vegetation, but some topsoil and soils). Implementation of the EEIP would also change the ground cover of many of the earthen embankments to ground surfaces similar to meadow or lawn (see the summary of Section 3.7 below). This section also examines the potential for stormwater runoff from implementation of the EEIP. While the potential for impacts presented in Section 3.2.2 are unavoidable, Section 3.2.4 presents aspects of the EEIP that will minimize and mitigate such impacts, including the use of erosion and sediment controls during construction, restoration and stabilization of slopes following construction, and providing properly placed and compacted fill where natural material has been removed, with prompt revegetation at all excavated areas.

Section 3.3 Geological Features and National Natural Landmarks identifies two National Natural Landmarks (NNLs) in the project area. The Moss Island NNL, having no earthen embankments, would not be affected by the EEIP, and the Montezuma Marshes NNL would be avoided.

Section 3.4 Surface Waters and Wetlands examines the potential for impacts from EEIP activities on surface waters and wetlands that may be found adjacent to earthen embankments. It also examines potential impacts from the use of pesticides on embankment areas on those surface

waters and wetlands. Overall, impacts would be localized and extended over distance and time. This includes the use of pesticides since the use of pesticides would not be a routine occurrence in the near or distant future. Such impacts would be unavoidable, but they would be minimized and mitigated on a site-specific basis in following regulatory practices required from permitting, including the use of licensed applicators.

Section 3.5 Groundwater focuses on groundwater and aquifers related to earthen embankments, where Section 3.2 focuses on the water table in and adjacent to earthen embankments. The section concludes that the potential for impacts resulting from EEIP activities on groundwater levels and contamination outside the canal right-of-way are expected to be insignificant.

Section 3.6 Floodplains examines the potential for impact to floodplains where EEIP activities would occur in or adjacent to floodplain areas. The section concludes that the potential adverse impacts would range from Negligible to Minor Adverse and would be site-specific. The impacts would also be spread out over time. There are no EEIP activities allowed where potential effects would impair the beneficial floodplain resources of New York State traversed by the embankment portions of the canal.

Section 3.7 Ecology (Plants and Animals) discusses potential effects of EEIP activities on plants and animals, and particularly on rare, threatened and endangered (RTE) species. The section includes a discussion of the loss of woody vegetation, habitat corridor fragmentation and the use of pesticides. The section concludes that EEIP activities would result in habitat loss for some wildlife, particularly in fragmenting habitat corridors currently on the earthen embankments. The extent of such impacts would depend on the adjacent habitat to any particular site-specific earthen embankment. Over time and the distance over which the EEIP will be applied, there is a potential for significant impacts to plants and animals. Minimization and mitigation for potential impacts to RTE species would involve consultations with regulatory agencies. A Land Cover Analysis concludes that implementation of the EEIP would cause a 0.041 percent shift in land cover over time relative to a County-wide perspective and indicates that species responding to converted habitat would have habitat left that it could move to.

Section 3.8 Agricultural Resources discusses the potential for impacts to agricultural resources from implementation of the EEIP. The section concludes that the magnitude for impacts from most EEIP activities is low, and the likelihood of impacts is also low. Planning and coordination with adjacent farmers (as documented in Sections 9 and 10 of the *Guide Book*) regarding the best means and timing of access to embankments would help to avoid or minimize the potential for temporary impacts to agricultural resources resulting from impaired access.

Section 3.9 Aesthetic Resources states that the EEIP activity of vegetation removal on affected embankments has the potential to change the visual quality of the canal corridor, which could lead to change or degradation of aesthetic and natural character, and degradation of outdoor recreational experiences. It goes on to discuss how the EEIP has been developed to diminish the

risk of failure of the earthen embankments while preserving the aesthetic and natural character where appropriate and possible to do so in a manner that minimizes residual risk to adjacent communities; however, it would not be possible to avoid or adequately mitigate all potential impacts to visual resources while assuring the stability and safety of the earthen embankments. Mitigation would be developed on a site-specific basis using procedures described in Sections 8-10 of the *Guide Book*.

Section 3.10 Historic and Archaeological Resources describes the NYSCC Historic Properties Management Plan and the procedures used to protect the historic resources in the New York State Barge Canal National Historic Landmark and other protected resources. There is limited potential for impacts to historic resources from implementation of the EEIP, since most of the resources are structures, and the EEIP pertains to earthen embankments. Any potential impacts to historic structures would be minimized such that the EEIP activities would have "No Adverse Impact/Effect" on historic resources.

Section 3.11 Open Space and Recreation Resources focuses on potential impacts to associated multi-use trails, such as the Empire State Trail, as well as formal and informal recreational uses on or immediately adjacent to the EEIP project area. A discussion of impacts to aesthetic resources associated with these recreational uses is provided in Section 3.9. The discussion in Section 3.11 includes temporary disruption of trail and other recreational activities. These impacts would be minimized through timing and planning for the implementation of any disrupting EEIP activities.

Section 3.12 Transportation Resources discusses potential impacts to waterway navigation on the canal, pedestrian and bicycle traffic on associated trails, and state, county and local roads adjacent to the EEIP project area. The EEIP activities may include temporary changes to existing pedestrian or bicycle accommodations; temporary changes to Canal System navigation; and temporary detours of vehicular traffic in order to carry out the EEIP. Minimization of temporary closures can be accomplished by scheduling trail or navigation closures for the minimum time necessary for accomplishing the work and allowing public access to the work area to resume under safe conditions.

Section 3.13 Noise, Odor and Light includes a discussion of these qualities that may be affected by implementation of the EEIP. Removal of vegetation has the potential to increase audibility of sound and visibility of light from existing sources. Effects on odors is discussed in this section, but the potential effects on odors from implementation of the EEIP is judged to be negligible. There are also temporary impacts from equipment performing EEIP activities. The section shows how, although permanent, indirect noise increases resulting from removal of dense vegetation cannot be avoided or minimized, removal of up to 200 feet of tall, dense vegetation has been demonstrated to be unnoticed to tolerable. The section points out that there may be unique situations where the line of sight between a noise source and receiver could exceed 200 feet. This may result in unavoidable impacts that cannot be attenuated or mitigated. In locations on

specific projects where an artificial light pollution evaluation determines that the effects of dense vegetation removal are significant, mitigation measures will be evaluated.

Section 3.14 Human Health discusses how NYSCC would identify, address, and mitigate potential impacts to public and to worker health during EEIP activities. Potential impacts of EEIP activities may include worker and/or public exposure to impacted and/or hazardous or contaminated material in the vicinity of EEIP activities. However, this potential adverse effect would be prevented by completion of due diligence prior to commencement of EEIP activities.

Section 3.15 Community Plans points out that the NYSCC is not subject to procedural or substantive requirements of Community Plans, local laws, etc., as complying with hundreds of different local laws would make maintaining earthen embankments in a safe manner impossible and unduly prejudices the NYSCC when it comes to implementing its statutory authority. However, the activities of federal, state, and local government are required to be consistent in communities where a locally adopted Local Waterfront Revitalization Program (LWRP) has been approved by the Secretary of State. The section discusses how community plans can provide guidance to assess potential impacts; and help in identifying where mitigation measures may be important to consider and incorporate into the implementation of the EEIP in a specific location. NYSCC will assess whether site specific proposed earthen embankment maintenance activities may have the potential for significant adverse impacts on areas that have been identified as part of a Community Plan. These identified areas will be given consideration for the NYSCC to avoid, minimize or mitigate to the extent practicable.

Section 3.16 Community Character describes community character as the cultural landscape of the canal corridor, as defined by the National and State Heritage Areas, and composed of the geographic areas associated with specific events, activities, or people. It concludes that removal of trees and/or vegetation would not have a significant impact to the corridor as a cultural landscape. Other EEIP activities involving earthwork and filter blankets would not significantly alter the slopes of the canal and feeder embankments and thus would have an insignificant effect on the cultural landscape and community character.

Where the EEIP has the potential for significant unavoidable impacts as identified by the thresholds in **Table *1.3-1***, procedures are outlined to avoid or mitigate those impacts, while implementing interim monitoring, further environmental consideration, and related actions before environmentally impactful EEIP activities would be implemented. If, after implementing these procedures, it is determined that adverse impacts cannot be avoided for a site-specific project, NYSCC may consider undertaking engineered solutions outside of the scope of the EEIP. **Figure *1.3-4*** summarizes these procedures and indicates that some alternative procedures that are not covered in this GEIS.

5 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Consistent with 6 NYCRR 617.9(b)(5)(iii)(c), all draft environmental impact statements must include any irreversible and irretrievable commitments of environmental resources that would be associated with the proposed action should it be implemented. This includes natural and manmade resources that are consumed, converted or made unavailable for further uses due to construction, operation, or use in the implementation of the EEIP, whether those losses would occur in the immediate future, or over the long term.[87] Such resources would not be able to be reversed, reclaimed or recovered.

Implementation of the EEIP would result ~~involve~~ in irreversible and irretrievable commitments of time, energy, and a range of natural, physical, human, and fiscal resources. Irretrievable resources that would be committed for the EEIP include:

- Fossil fuels and materials used in clearing and restoration of the earthen embankments;
- Labor used in the EEIP activity including the construction activities above and for the maintenance in subsequent years;
- Continued commitment of land for use as earthen embankments and minor areas of increases in land where embankments need to be extended; and
- The EEIP would also require continued expenditure of both funds that is not retrievable.

The EEIP would result in the loss of existing vegetation. It may also result in the minor loss of surface waters, wetlands and habitat in some locations, but these losses would be mitigated. It also has the potential to affect aesthetic resources and recreation. However, such commitments would be identified in site-specific environmental analyses consistent with the process set forth in the GEIS and *Guide Book* and avoided or minimized in accordance with applicable laws and regulations, as discussed in Chapter 8 and in the *Guide Book*.

While the EEIP would result in irreversible and irretrievable commitments of resources, the resources are not in short supply. Furthermore, the overall benefits outweigh these commitments. Initial consumption of materials and energy in clearing embankments, would allow minimal use of energy in maintaining the embankments in future years. This would be a more efficient use of resources and build more sustainability into the canal system. The EEIP would maintain the safety and reliability of the earthen embankments, which would benefit users of the canal as well as reduce the risk of embankment failure to adjacent and downstream properties.

[87] New York State Department of Environmental Conservation, The SEQR Handbook, Fourth Edition, 2020, p, 121.

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